JOIDES PLANNING COMMITTEE ANNUAL MEETING
4 - 7 December, 1991
University of Texas at Austin

AGENDA

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Additional Attachments

As of November 19, 1991

JOIDES MEETING SCHEDULE

Date	Place	Committee/Panel
1991		
03 December	Austin, TX	Panel Chairpersons
04-07 December	Austin, TX	PCOM
1992		
14-16 January	Bonn, Germany	EXCOM
17-18 January	Bonn, Germany	BCOM
28-30 January	Kailua-Kona, HI	DMP
3-6 February*	Miami, FL	OD-WG
March*	Miami, FL	SGPP
5-7 March*	St. Petersburg, FL	OHP
10-11 March*	Palisades, NY	PPSP
18-20 March*	Davis, CA	LITHP
19-23 March*	Las Vegas, NV	TECP
1-4 April*	College Station, TX	IHP
2-4 April*	Copenhagen, Denmark	SSP
April*	College Station, TX	TEDCOM
21-23 April	Corvallis, OR	PCOM
18-20 May*	Paris, France	OD-WG
June*	Europe	SL-WG
11-13 August	Canada	PCOM
September*	Marseilles, France	IHP
Annual Meeting	Bermuda?	PCOM

*Meeting not yet formally requested and/or approved

JOIDES Resolution Operations Schedule

Leg	Program	Cruise Dates	Transit	Days On Site	Total	In Port
141	Chile Triple Junction	17 Nov.-13 Jan. '92	18	39	57	Valparaiso, 13-17 Jan. '92
142	Engineering, EPR	18 Jan.-19 Mar. '92	25	36	61	Honolulu, 19-23 Mar. '92
143	Atolls & Guyots A	24 Mar.-20 May '92	12	44	56	Majuro, 20-24 May '92
144	Atolls & Guyots B	24 May-20 July '92	12	44	56	Yokohama, 20-24 July '92
145	North Pacific Transect	25 July-21 Sept. '92	20	39	59	Victoria, 21-25 Sept. '92
146	Cascadia	26 Sept.-21 Nov. '92	6	50	56	San Diego, 21-25 Nov. '92
147	Hess Deep	26 Nov. '92-21 Jan. '93	14	42	56	Panama into the Atlantic

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JOIDES PLANNING COMMITTEE ANNUAL MEETING
4 - 7 December, 1991
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AGENDA NOTES

Wednesday, 4 December 1991 (9:00 AM)

Item A. Welcome and Introduction

1. Welcome and comments about meeting logistics (J. Austin).

2. Introduction of PCOM members, panel chairpersons, liaisons and guests.

Item B. Approval of Minutes

1. The attached revised draft minutes of the 20-22 August 1991 PCOM Meeting at Bundesanstalt für Geowissenschaften und Rohstoffe include corrections received at the JOIDES Office through 15 November.

2. ACTION Call for additional corrections or additions; call for approval.

Item C. Approval of Agenda

1. Comments about scheduling of the meeting and organization of its agenda (J. Austin).

• The two main purposes for the Annual Meeting are to exchange information among the JOIDES panels, the different parts of the ODP organization, and the Planning Committee (see Agenda **Items D., E., G., H.-J.**), and to prepare the next one-year drilling plan, in this case for fiscal year (FY) 1993 (late January, 1993 to ~October, 1993). See Agenda **Items L.-M.**

• Other important but subordinate purposes are: to hear recent scientific results from Sedimented Ridges/Middle Valley drilling (Leg 139) and Hole 504B (Leg 140) (Agenda **Item F.**), consider short-term changes in the FY 92 drilling schedule related to possible scheduling of "supplemental" science (legs 144 and 145) and testing of Geoprops (Leg 146) (Agenda **Item K.**), decide matters related to the various reports, and conduct routine PCOM business (Agenda **Items N.-S.**).

• In oral presentations concerning their activities over the past year, Panel Chairs and liaisons should answer any questions addressed to them by PCOM previously, stress points that bear on future (particularly FY 93) planning, and raise any issues that need to be resolved at this meeting. Details can be left to the panel minutes (appended as attachments to this Agenda Book, if received at the JOIDES Office by 11/15/91). *[Note: Immediately following these reports, copies of any overheads used should be given to JOIDES Office personnel for inclusion as appendices to the minutes of this meeting.]*

a. Wednesday: Reports by liaisons to PCOM, the service panels and technical committees (Agenda **Items D and E.**). All parties are urged to keep their reports and related discussion to ~20-30 minutes, without sacrificing the charge to reporters as stipulated above. If/when complicated issues arise, time will be made available later for further discussion as feasible/appropriate (probably under Agenda **Item S.**). *[Note: This day's meeting will come to an end at 3:00PM, so that the group can attend a sunset cruise/dinner hosted by the University of Texas Institute for Geophysics/Joint Oceanographic Institutions, Inc. aboard a riverboat on nearby Lake Travis.]*

b. Thursday: The day will lead off with scientific summaries from legs 139 and 140 (Agenda **Item F.**), followed by a report of the annual Panel Chairs meeting (PANCHM, held Tuesday, 12/3) and associated discussion (Agenda **Item G.**). The rest of the day will deal with reports that bear more directly on FY 93 planning in the North Atlantic, first by thematic panels (Agenda **Item H.**) and then by Detailed Planning Groups (DPGs) and Working Groups (WGs) (Agenda **Item I.**). This will be followed by summaries of the status of engineering and technical developments by ODP subcontractors (Agenda **Item J.**).

c. Friday: First, short-term planning, related to possible modifications of the FY 92 program in the Pacific (i.e., "supplemental" science, legs 144 and 145; schedule for Geoprops testing, Leg 146) (Agenda **Item K.**). Then, preparation of the FY 93 drilling schedule in the North Atlantic (Agenda **Items L. and M.**). *[Note: Highly-ranked North Atlantic programs, re-ranked by thematic panels for the purpose of incorporation into the FY 93 drilling schedule, are incorporated in the "North Atlantic Prospectus" (NAP), prepared and distributed by the JOIDES Office. Although limited spare copies of the NAP will be available at the meeting, PCOM members and Panel Chairs are expected to bring their copies to the meeting for reference purposes. Sorry about that!]* Continued consideration of major issues, including any detailed planning requirements for 1992 PCOM meetings (Agenda **Item** N.). *[Note: Panel chairpersons are urged to remain for as long as possible during these activities, to be available as possible sources of information for PCOM deliberations.]*

d. Saturday: Routine PCOM affairs, including personnel decisions (Agenda **Items O. and P.**), status of DPGs and WGs (Agenda **Item Q.**), future meetings (Agenda **Item R.**) and matters deferred from earlier in the week (Agenda **Item S.**). Under Other Business (**Item S.**), potential PCOM action items derived from JOIDES Office perusal of recent panel minutes include: formation of a "steering group" to implement the *ad hoc* WG report on *in-situ* pore fluid sampling [DMP] and establishment of a WG to consider all ODP hardware/software systems [IHP]. In addition, PCOM has been asked by ODP-TAMU to provide input on procedures for getting advice on equipment purchases. Other items for discussion may be brought forward at the outset of the meeting, or may arise Thursday as a result of PANCHM deliberations.

2. ACTION Call for additions to Agenda **Item S.**; call for other additions or revisions; call for agenda approval.

Item D. ODP Reports by Liaisons to PCOM

1. EXCOM (J. Austin, liaison).

a. EXCOM has not met since the August PCOM meeting. At its July 1991 meeting at Scripps Institutions of Oceanography, EXCOM approved the FY 92 Program Plan, with the following motion:

> EXCOM endorses the FY92 Program Plan as written, with the following caveat, as described to EXCOM by the PCOM chair:
>
> 1) Leg 140 will be conducted in the Program Plan as described (return to 504B, with the back-up to be Hess Deep);
>
> *2) If Leg 140 is Hole 504B, Leg 147 will be Hess Deep;* [italics added]
>
> 3) If Leg 140 takes place predominantly at Hess Deep, the site of Leg 147 operations will be one of the following:
> - Hess Deep, if Leg 140 operations there are deemed by PCOM to be successful;

• EPR for continued DCS testing, if Leg 140 operations at Hess Deep are deemed by PCOM to be unsuccessful;
• the North Atlantic (for one of the anticipated highly-ranked programs there), if Hess Deep operations are unsuccessful and further EPR DCS testing is deemed not feasible by PCOM because of the pace of DCS Phase III development during FY92.

In light of the recent success of Leg 140 at 504B, the PCOM chair reminds PCOM that Leg 147, the first leg fully within FY 1993 (26 November 1992-21 January 1993), will be Hess Deep. *[Note: Additional details on the progress of development of DCS Phase III will be provided under Agenda **Item J.**]*

b. At its next meeting, in Germany in January 1992, EXCOM will continue to consider renewal and begin to analyze incorporation of "additional" platforms into ODP long-range planning.

• As part of that process, NSF / JOI, Inc. have authorized initiation of an OPCOM-suggested (June 1991) and PCOM-endorsed (August 1991) study by an outside expert (Herbert Zaremba, ex-AMOCO) on the availabilities / capabilities of such platforms, with particular reference to their integration with highly ranked programs either on the FY 92 (e.g., Atolls and Guyots, legs 143/144) or (potentially) on the FY 93 (e.g., New Jersey sea-level / "Middle Atlantic Transect") drilling schedules. A proposal is presently being written by Zaremba; the study may eventually be supported with OPCOM funds (pending their release for use, probably after January 1992, see NSF report, Agenda **Item D.2.**). The study may be ready in time for the April 1992 PCOM meeting.

2. NSF (B. Malfait, liaison).

a. Resource issues and budget status.

b. Membership issues and status of planning for renewal / reviews.

c. Other information.

3. JOI, Inc. (T. Pyle, liaison).

a. Budgetary and other current information that may affect the current FY 92 program.

b. Planning for the FY 93-96 Program.

c. Other information.

(Approximately 10:30 AM) Coffee Break

4. Science Operator / ODP - TAMU (T. Francis / A. Meyer, liaisons; not to include status of engineering and technical developments, Agenda **Item J.**).

a. Present operations.

b. Status of FY 92 drilling program: schedule, co-chiefs, clearances, safety reviews, and related factors.

c. Publications.

d. Developments at ODP-TAMU.

e. Leg staffing (A. Meyer).

5. Wireline Logging (M. Lyle / liaison; not to include status of engineering and technical developments, see Agenda **Item J.**).

a. Recent operations, performance, and results: legs 139, 140 and 141.

b. North Atlantic Downhole Measurements Prospectus (see Appendix IV, 10/91 DMP minutes attached to this Agenda Book).

c. Other comments.

6. ACTION Before recess: Identification of action items from morning reports; take action or postpone (probably to **Item S.**) as appropriate.

(Approximately 12:00-1:15 PM) Lunch

Item E. Annual Reports by Service Panel Chairs
*[Note: At the discretion of the PCOM chair, action items identified from these reports will either be dealt with as they arise, deferred to **Agenda Item E.7.**, or deferred to **Agenda Item S.**]*

1. DMP (P. Worthington).

• The PCOM chair suggests to the DMP chair that he include as part of this report a summary of the activities of the *ad hoc* "Working Group on *In-situ* Pore Fluid Sampling", which met in August 1991 in Houston under the direction of the DMP chair and D. Huey of ODP-TAMU. PCOM endorsed formation of this group [by consensus] in April 1991. (Note: PCOM action on the group's recommendation(s) will be deferred to Agenda **Item S.**)

2. IHP (I. Gibson).

3. PPSP (M. Ball).

4. SMP (K. Moran).

(Approximately 3:00 PM: End of the day's session, in order to board a bus which will be waiting at the Thompson Conference Center to transport the group to Lake Travis (~20 miles west of Austin), where the Institute for Geophysics and Joint Oceanographic Institutions, Inc. will co-host a sunset (we hope!) cruise/dinner aboard a riverboat. Please plan to take the bus, as the way to Travis can be confusing for the uninitiated (or inebriated, at least on the way home). For those with cars, the bus will stop at the Conference Center en route to the hotel at the conclusion of the evening.]

Thursday, 5 December 1991 (8:30 AM)

Item E. Annual Reports by Service Panel Chairs (cont.)
*[Note: At the discretion of the PCOM chair, action items identified from these reports will either be dealt with as they arise, deferred to Agenda **Item E.7.** or deferred to Agenda **Item S.**]*

5. SSP (R. Kidd).

6. TEDCOM (C. Sparks).

7. ACTION Identify action items from reports of service panel chairpersons; take action or postpone (probably to **Item S.**) as appropriate.

Item F. Scientific Reports of Recent Drilling

1. Leg 139: Sedimented Ridges/Middle Valley (E. Davis, co-chief).

2. Leg 140: Hole 504B (H. Dick, co-chief).

(Approximately 10:15 AM) Coffee Break

Item G. Report of the Annual Panel Chairs Meeting (PANCHM) (S. Humphris)

1. The report of the Tuesday, 3 November, meeting of Panel Chairs will be given by its *pro tem* chair, S. Humphris (LITHP).

2. ACTION items from PANCHM; take action or postpone (probably to **Item S.**) as appropriate.

Item H. Annual Reports by Thematic Panel Chairs
*[Note: The PCOM chair instructs thematic panel chairs to exclude from these reports discussions re: their ranking of programs for the FY 93 drilling schedule, which will take place under Agenda **Item M.** At that time, they will be given the opportunity to present their rankings and the rationale(s) for them.]*

1. LITHP (S. Humphris).

2. TECP (E. Moores).

(Approximately 12:15-1:30 PM) Lunch

3. OHP (N. Shackleton).

4. SGPP (J. McKenzie).

5. ACTION Identification of action items from reports by the thematic panels; take action or postpone (probably to **Item S.**) as appropriate.

Item I. Reports of Detailed Planning Groups/Working Groups

1. North Atlantic-Arctic Gateways, NAAG-DPG (W. Ruddiman, chair. PCOM liaison was M. Leinen.).

a. Final report was distributed and reported on by the PCOM liaison at the April 1991 PCOM Meeting in Rhode Island, and forms part of the NAP; an edited version appeared in the June 1991 issue of the *JOIDES Journal.*

b. Disbanded by PCOM (motion) in April 1991.

c. Ruddiman is not expected at this meeting. R. Larson, M. Leinen's replacement, should plan to present results of this DPG to PCOM at this meeting.

2. North Atlantic Rifted Margins, NARM-DPG (H.-C. Larsen/D. Sawyer, co-chairs. PCOM liaisons are B. Tucholke and U. von Rad.).

a. "Final" report is included in the NAP; an executive summary appeared in the most recent issue [Fall 1991] of the *JOIDES Journal.* PCOM liaisons reported on the NARM-DPG's deliberations at both the April and August 1991 PCOM meetings.

b. Not yet disbanded by PCOM.

c. Larsen is expected to present "final" results of this DPG to PCOM at this meeting.

(Approximately 3:15 PM) Coffee Break

3. Offset Drilling Working Group, OD-WG (F. Vine, chair, not expected at this meeting. PCOM liaison is B. Taylor.).

a. Has met once, in mid-August 1991; full minutes from that meeting are attached to this Agenda Book. PCOM got a report from its liaison at the August 1991 Hannover meeting. An executive summary was included with North Atlantic OD programs in the NAP.

b. Expects to meet twice in 1992: February and May.

c. PCOM chair calls on the liaison to add any relevant information developed since the last meeting of PCOM (see also Agenda **Item Q.**).

4. Sea Level Working Group, SL-WG (P. Crevello, chair, not expected at this meeting. PCOM liaison is J. Watkins.).

a. Has met twice, most recently in November 1991; the minutes are attached to this Agenda Book. Chair reported to PCOM at its April 1991 meeting in Rhode Island.

b. Expects to meet one more time, in June 1992.

c. PCOM chair calls on the liaison to add any relevant information developed since the last meeting of PCOM. C. Fulthorpe of the JOIDES Office also attended the November SL-WG meeting; additional comments from him are welcome.

5. ACTION Identification of action items from afternoon DPG reports. As both the NAAG and NARM programs are part of the NAP, and also rely to varying degrees on engineering and / or technical developments, PCOM may choose to defer action on them to Agenda **Items L.** and **M.**

Item J. Status of Engineering and Technical Developments

1. ODP - TAMU (M. Storms, liaison).

a. Diamond Coring System (DCS):
Preparations for Leg 142 drilling with DCS Phase IIB.
Plans for DCS Phase III. Implications for Leg 147.

b. Status of:
Extended Core Barrel (XCB) improvements
Sonic Core Monitor (SCM) / Hard Rock Orientation / Electronic Multishot
Vibra Percussive Corer (VPC)
Motor Driven Core Barrel (MDCB) (+Geoprops?)

c. Approach to deep-penetration drilling.

d. Statistical analysis of ice conditions in Fram Strait, relevant to potential ODP drilling in summer 1993 or 1994 (T. Francis).

2. Wireline Logging (M. Lyle, liaison).

a. Status of slimhole and high-temperature tool development and testing.

b. New logging tool development.

c. Core / log integration.

3. ACTION Identification of action items from afternoon DPG / WG reports and summary of status of engineering and technical developments, particularly as they relate to planning for FY 93 drilling activities in the North Atlantic; take action or postpone (probably to Agenda Items L. and M.) as appropriate.

Friday, 6 December 1991 (8:30 AM)

Item K. Short Term Planning (FY 92 / Pacific)

1. PCOM must resolve two outstanding issues related to the remainder of the FY 92 program: whether or not to schedule "supplemental" science on Leg 144 (logging 801C) and / or Leg 145 (drilling / casing OSN-2), and determination of the pace of Geoprops testing (now scheduled for Leg 146, but see correspondence between B. Carson, Leg 146 co-chief, and the PCOM chair on this matter, attached to this Agenda Book).

2. "Supplemental" Science.

a. The concept of "S" proposals was developed and instituted at the 1990 Annual Meeting of PCOM with Panel Chairs. Announcements advertising for their submission to ODP were placed both in the February 1991 *JOIDES Journal* and appeared in *Eos* in early 1991.

b. The three submitted "S" proposals were considered at the August 1991 meeting of PCOM (see minutes attached to this Agenda Book). Two were dealt with in the following motions and a consensus:

Upon evaluation of the three supplemental science proposals we have received, PCOM ranks the potential science return of S-3 (OSN-2) the highest. Therefore, PCOM will consider only S-3 for scheduling in FY 92.

PCOM moves that the supplemental science proposal S-2 (to log Hole 801C) be incorporated in the prospectus of legs 143/144 (Atolls and Guyots) as an alternate site, and that the appointed co-chief scientists consider logging at Hole 801C, which has a considerable scientific merit as recognized by the thematic panels and by PCOM, if time is available.

In order to decide at the Annual Meeting whether to reserve a maximum of 10 days during Leg 145 for drilling a re-entry hole, OSN-2, paired with NW-1A (Supplemental Science Proposal S-3), PCOM asks the thematic panels and co-chiefs for Leg 145 to determine which sites would be modified or dropped to accommodate up to 10 days at OSN-2. *[Note: Consensus]*

As a result of extensive discussion at the August meeting (see the minutes) and afterwards, the PCOM chair decided to get additional feedback from the thematic panels (see correspondence attached to this Agenda Book) on scheduled science to drop if either logging 801C were to be put on the Leg 144 schedule or drilling / casing OSN-2 were to be included as part of Leg 145. Following are excerpts from fall 1991 thematic panel minutes (attached to this Agenda Book) on the issue:

• LITHP:

- re: logging 801C - "LITHP supports logging of 801C and its incorporation into Leg 144, and is willing to give up 3.5 days of basement drilling to accomplish the logging programs. However, LITHP is not willing to give up planned basement drilling at MIT-1."

(The PCOM chair consulted the A & G DPG report [June 1991 JOIDES Journal] on LITHP's recommendation. Although drilling to basement as a goal is mentioned for Harrie-1 [beneath 450 m sediment], Pel-3/Lo-En Guyot [beneath 400 m sediment], and Syl-1 [beneath 400 m sediment], all of these Leg 144 sites are to bit destruction only [or time on site]. No basement penetration is assured. Total time on site for these three locations [not including logging]: 16.8 days.)* ***(*but see 11/15 letter from 144 co-chiefs to PCOM chair)***

- re: OSN-2 - "LITHP considers it unacceptable to devastate Leg 145 by removing 10 days from its schedule and feels this is a subversion of the planning process. LITHP is willing to give up the lithospheric objectives of Leg 145 in order to drill OSN-2. In so doing, LITHP notes the following:

• there is not enough drilling of LITHP interest in Leg 145 to provide the necessary time to complete OSN-2.

• the willingness of LITHP to accommodate drilling OSN-2 is due to Leg 145 not addressing high priority LITHP objectives."

[Note: The PCOM chair draws PCOM's attention to a 10/16 letter (attached to this Agenda Book) from Tim Francis to Adam Dziewonski, proponent for OSN-2, detailing the latest ODP - TAMU estimate for OSN-2 operations as ***5.7 days,*** *including almost 1 day of contingency time.]*

• TECP:

- re: logging 801C - "TECP places high priority on the logging of hole 801C. TECP's main interest in legs 143 and 144 is in questions of plate kinematics. These involve the preservation of a latitudinal spread of basement penetrations. TECP believes that the time allotted to Atolls and Guyots is generous. If something must be cut, however, TECP recommends that basement penetration be sacrificed in mid-latitude sites, preserving the maximum latitudinal spread of basement samples."

(The PCOM chair notes that this strategy would favor preserving basement penetration at Harrie-1 [~5° N], while potentially sacrificing time at Pel-3 and/or Syl-1 [both at ~10° N]. Site MIT-1 is at ~27°N.)

- re: OSN-2 - "Establishment of a global seismic net is extremely important for the long-term objectives of TECP, of ODP, and, indeed, of the global geoscience community. We strongly support the drilling of OSN-2...TECP does have interests in obtaining basement ages at the ocean floor sites and age and paleolatitude information at the seamount sites. If necessary, we would give up any time that might have been devoted to these objectives...some of the potential tectonic objectives are more important than others":

- highest: "significant" basement penetration at Detroit Seamount.
- intermediate: basement information from NW3A.
- lowest *(i.e., easiest to delete, if OSN-2 is drilled):* information from seamount site PM1 and sea floor sites NW-1A and NW-4A.

(The PCOM chair notes that, if OSN-2 is drilled at NW-1A, it will provide basement information at the location of least interest to TECP.)

• OHP:

- re: logging 801C - "Given the special circumstances and the unique opportunity represented by logging the very old crust at Site 801, OHP are willing to see one of the lower-ranked objectives in this leg sacrificed or modified at the discretion of the co-chief scientists in order to allow a specified and limited amount of time (less than 3.3 days) to be spent logging Hole 801C."

- re: OSN-2 - "OHP urges PCOM NOT to schedule proposal S-3 (cased hole for emplacing a seismometer). It clearly cannot be accomplished within the guidelines published for S-proposals and thus would take a disproportionate amount of the time available for scientific drilling on Leg 145...If PCOM does schedule S-3, it will at least require either all but the APC coring at Site DS-3 (eliminating the major Mesozoic opportunity for Leg 145) or dropping all but the APC coring at Site DS-1 (eliminating the major Paleogene opportunities for Leg 145)." OHP considered the following options, if OSN-2 is scheduled, listed here in order of increasing "lack of enthusiasm" (any one of the options listed below would provide the time necessary to accommodate activities surrounding OSN-2):

- reduce DS-1 to double APC/XCB, eliminating Paleogene and Mesozoic.
- reduce DS-3 to double APC/XCB, eliminating Paleogene and Mesozoic.
- eliminate NW-4 and DS-2 or DS-2A.
- eliminate PM-1.

Of the first two (i.e., "more desirable") options, OHP said that they were "almost evenly split as to which of these is the most important and the final decision should be taken in consultation with the co-chiefs."

(The PCOM chair draws PCOM/Panel Chairs' attention to OHP's reservations that basement can be reached at all at Site DS-1 [see p. 4, OHP minutes], underscoring the OHP primary preference for deletion, listed above. Such a penetration is, nonetheless, the highest TECP goal for Leg 145.)

• SGPP:

- re: logging 801C - "SGPP supports supplemental science proposal S-2 to log Hole 801C during Leg 144 because of the potentially valuable scientific information that will be obtained from the downhole measurements to be performed on the oldest drilled oceanic crust. SGPP recommends that the logging of Hole 801C be given first priority status on the condition that logging time be gained through the sacrifice of drilling time for basement penetration at mid-latitude sites..." [see TECP above]

- re: OSN-2 - "SGPP does not support supplemental science proposal S-3 because the necessary experimentation at the first hole [OSN-1] has not been made, the need for drilling a second hole does not seem to be warranted at this time and the 6-8 days needed to complete OSN-2 do not meet the time criteria of a supplemental science proposal. Although SGPP has no thematic interest associated with the OSN, it recognizes its scientific importance and encourages the submission of less than one leg proposals to drill future dedicated OSN holes."

c. **Suggested Courses of Action:** At the risk of putting his head squarely in a noose (where it seems to be most of the time anyway), but in the (faint) hope of expediting discussion and dispatching the "supplemental" science issue (forever?), the PCOM chair recommends the following to the assembled multitudes:

- re: logging 801C - leave it as a (scientifically important, not to be missed if at all possible!) alternate, in support of the August 1991 PCOM action.

Pros: 1) A & G science will not be abridged. As is true with every other ODP program, the drilling slate for A & G (both legs) is over-full (see 11/15/91 letter from Leg 144 co-chiefs to PCOM chair). PCOM would not have scheduled two legs for this science in 1990 if it were not warranted! PCOM should also remember that it has already asked the A & G co-chiefs to accommodate a 60-hour test of the shallow-water drilling capability of *Resolution* during Leg 143, which does not specifically advance their scientific objectives. Furthermore, the co-chiefs have indicated a willingness to accommodate logging at 801C, if it is logistically feasible (see 9/9 letter from Winterer to Austin, attached to this Agenda Book); 2) PCOM will not be viewed as having reversed itself, no small comfort in these complex times, particularly with ODP renewal under consideration.

Cons: 1) Hole 801C is an important window into Jurassic oceanic crust, and many (including, it seems, all of the thematic panels and DMP) will view that PCOM has missed an "opportunity" to derive as much information as possible from that window if the hole is not logged during Leg 144. However, the PCOM chair was persuaded by arguments presented at the August 1991 PCOM (see the minutes) that the "opportunity" is not as large as some have made it out to be (e.g., see the DMP Consensus on this issue, p. 14 of their minutes). The PCOM chair would prefer to see a resubmission of the proposal to deepen Hole 801C, in conjunction with a full logging program at that time; 2) The proponent will be upset, no small concern to the PCOM chair, who must deal with him. Nonetheless, the proponent has indicated a willingness to serve as logging scientist for all of Leg 144, which will give him considerable leverage for pushing his "alternate" at sea. (The PCOM chair supports the proponent's participation on Leg 144, while pitying the co-chiefs in question.)

- re: OSN-2 - in light of the degree to which proposed and scheduled drilling will be affected, decline to schedule OSN-2 on Leg 145.

Pros: 1) OHP, LITHP, SGPP and the co-chiefs will be happy, along with the community of existing North Pacific proponents (see assorted correspondence attached to this Agenda Book); 2) Additional time will be available for planned basement penetrations, which should broaden the appeal of this leg beyond the paleoceanographic community; 3) Original S-proposal guidelines (re: maximum duration = 4 days) will be observed; 4) PCOM avoids embarrassment, if existing time estimates for drilling and casing OSN-2 prove optimistic (as was true for OSN-1, Leg 136).

Cons: 1) TECP, OSN-2 proponents and the FDSN community they represent may not be satisfied. (PCOM cannot win here.) However, the June 1991 report "JOI / IRIS Ocean Seismic Network / U.S. Pilot Experiment Task Force Meeting" (available from JOI, Inc.) suggests that activities at OSN-1 off Oahu will occupy the FDSN community for some time to come, so ODP has generated goodwill in that forum. FDSN can certainly, and should be encouraged to, submit future plans for other OSN holes (worldwide), to be dealt with in the normal review process; 2) If logging at Hole 801C is not scheduled, PCOM will not have scheduled a single "supplemental" science proposal for drilling, which might be viewed by some as a waste of a lot of time. The PCOM chair disagrees. Some experiments work; others do not. The "supplemental" science philosophy does not work, but ODP has given it a (very) fair hearing. PCOM continues to encourage submission of "short" (i.e., non-leg length) proposals, but they must be incorporated into the planning process at an early (i.e., pre-scheduling) stage. Any other strategy leads to internal dissent and ultimately advisory system deadlock, as the August 1991 PCOM meeting and subsequent events clearly show.

3. **Pace of Geoprops testing.**

• At its August 1991 meeting, PCOM passed the following motion re: Geoprops:

PCOM reaffirms the critical importance of the development of GEOPROPS, or tool of comparable capability, as an integral part of scientific planning. PCOM further recommends that OPCOM funds be made available as soon as practicable to further this aim. *PCOM anticipates that a suitable tool could be tested on Leg 146.* [italics added]

• Since that time, B. Carson (Lehigh Univ.), designated 146 co-chief, has taken over supervision of Geoprops development, in concert with ODP - TAMU. Initial expectations had been to attempt to test a redesigned / reconfigured tool on a leg prior to Leg 146. Leg 143 had been mentioned. Conflict arose because the time required to carry out multiple deployments of Geoprops / MDCB during the Leg 143 appeared excessive (perhaps 2-3 days), and such testing did not directly contribute to A & G scientific objectives. Now it appears likely that Geoprops can only be tested on Leg 146, which is in line with PCOM's expectations (stated above), but contrary to co-chief wishes (see Carson / Austin correspondence attached to this Agenda Book). B. Carson has requested that PCOM consider this issue.

ACTION PCOM should reiterate its support for expeditious Geoprops development, but clarify its expectations regarding timing for at-sea testing.

(Approximately 10:30AM) Coffee Break

Item L. Detailed Planning Information for North Atlantic Drilling

1. PCOM's task is to consider the programs (listed below) detailed in the FY 1993 "North Atlantic Prospectus" (NAP) prepared by the JOIDES Office *[Note: While a few extra copies will be available at the meeting, PCOM members and panel chairs are expected to have read and to bring this document with them to the meeting!]* and construct a drilling schedule to fill the time-frame from late January 1993 (conclusion of Leg 147 and expected time for the ship's departure from the eastern Pacific for the Atlantic, agreed upon by PCOM at its 1990 Annual Meeting) to ~October 1993. This exercise involves the scheduling of approximately five (5) legs, one of which may be an engineering leg, as per past PCOM practice. As part of this process, PCOM may want to consider tentative scheduling beyond the end of FY 93, while bearing in mind that renewal may not occur and these programs may never be drilled.

2. To get this discussion started, the PCOM chair requests that PCOM watchdogs each be prepared to give a short (~10 minute) summary of the scientific objectives of NAP programs, as listed below. These presentations should stress thematic impact of the proposed work, its reliance on developing technology and engineering, and any other considerations essential to PCOM deliberations (e.g., sufficiency of site survey information, weather constraints, environmental impact, etc.)

[Note: To aid in these presentations, the JOIDES Office has prepared a series of overheads of pertinent figures from the programs under consideration which will be available at the meeting.]

The PCOM chairperson asks that presentations occur in the order listed below (alphabetical order, by first letter of the designated acronym). PCOM watchdogs for these programs were assigned in August 1991, and are as follows:

- Alboran Basin/gateway & Mediterranean Ridge (AB) - D. Cowan
- Ceara Rise (CR) - J. Watkins
- Equatorial Atlantic Transform (EAT) - J. Mutter
- MAR Offset Drilling (MAR) - B. Taylor
- Mediterranean sapropels (MS) - M. Cita-Sironi
- NAAG-DPG (NAAG) - M. Leinen (or URI replacement)
- NARM-DPG (NARM) - R. Duncan (volcanic) / U. von Rad (non-volcanic)
- New Jersey sea level / "Middle Atlantic Transect" (NJ / MAT) - A. Sharaskin
- TAG Hydrothermal (TAG) - K. Becker
- VICAP Gran Canaria (VICAP) - J. Malpas

(Approximately 12:15-1:30 PM) Lunch

Item M. Program Plan for FY 93 - North Atlantic

1. Previous discussions within PCOM and the considerations noted above suggest that time should be made available during FY 93 (and perhaps early FY 94) for approximately five (5) legs of North Atlantic drilling, or perhaps four (4) legs and an engineering leg. Additional items for PCOM consideration are noted below:

a. AB: -

b. CR: -

c. EAT: -

d. MAR: LITHP has suggested that "the next meeting of the OD-WG be specifically charged with developing an initial drilling strategy for the Atlantic and laying out a provisional strategy for Atlantic drilling." TECP supports this suggestion, adding that the OD-WG (or a DPG) "...should include an integration of tectonic and lithospheric themes, and it should include all the site survey and geologic setting information..." *(Potential PCOM actions to modify the mandate of the OD-WG in accordance with thematic panel suggestions will be taken up under Agenda **Item Q**.)*

e. MS: -

f. NAAG is designed as a possible two-leg program. Successful drilling of high-latitude sites on both legs will require the ideal weather window, late August to early September. This suggests that both legs cannot occur in the same fiscal year (see also comments about pacing of the NAAG program in the OHP minutes).

g. NARM is designed as a multi-leg program. The NARM-DPG has envisaged drilling one volcanic and one non-volcanic leg per year; thematic panels have ranked volcanic and non-volcanic components of this program separately.

h. NJ / MAT: Six sites are located in water depths between 50 and 100 m. These sites are thought to be within the capabilities of *JOIDES Resolution*'s DP system, but will require ideal weather conditions, regardless of the results of the Enewetak lagoon test (Leg 143). Therefore, a May-August weather window is required.

i. TAG: DCS is not required, but TAG could form another at-sea test of DCS Phase IIB. PCOM should consider this option when discussing TAG. However, whether or not such a decision would make TAG an "engineering" as opposed to a "science" leg must probably await the outcome of Leg 142.

j. VICAP: -

2. This blank schedule is provided to assist PCOM members / Panel Chairs with draft planning:

Leg	Approx. Months	Notes	Program
148	Jan 93-Mar 93	no NAAG-NJ / MAT	
149	Mar-May	"	
150	May-July	no NAAG	
151	July-Sep	NAAG I here	
152	Sep-Nov	no NAAG-NJ / MAT	
153(?)	Nov 93-Jan 94	"	

3. **Thematic Panel Rankings** (from the October / November 1991 minutes, attached to this Agenda Book).
[Note: The PCOM chair asks each thematic panel chair to be prepared to display and to justify their fall 1991 ranking of North Atlantic programs at this time. They should also be prepared to define and justify their ranking / voting procedure(s), particularly if such procedures are not clearly spelled out in their minutes, in order that PCOM can assess potential conflicts of interest.]

• The JOIDES Office has summarized thematic panel rankings of NAP and "new" North Atlantic programs in the accompanying tables, which also include global rankings (and the position of North Atlantic programs within those global rankings) for both 1990 and 1991.

a. LITHP - made two recommendations to PCOM concerning their ranking (see accompanying tables):

000026

FY93 Thematic Panel Rankings (North Atlantic)

Compared with global rankings 1990 and 1991

*N. Atl.	Position of North Atlantic proposals in global ranking lists
-	Not ranked
————	New proposal

Lithosphere Panel (LITHP)

FY93 Rank	Key title	Global Ranking 1991		Global Ranking 1990	
		global	*N. Atl.	global	*N. Atl.
1	TAG	2	1	4	2
2	NARM (volc.)	4	2	11	5
3	MAR / Offset Drilling	6-7	3-4	3	1; 3-4
4	NARM (non-volc.)	8	5	-	-
5	VICAP	-	-	-	-
6	AB (#323 + #399)	18	7	-	-
7	EAT	-	-	-	-
8	MR	-	-	-	-
9	NAAG	-	-	-	-

Tectonics Panel (TECP)

FY93 Rank	Key title	Global Ranking 1991		Global Ranking 1990	
		global	*N. Atl.	global	*N. Atl.
1	NARM (non-volc.)	1	1	2	1
2	NARM (volc.)	1	1	5	2
3	EAT	4	3	7	4
4	AB (#323)	2	2	-	-
5	K/T - Gulf of Mexico	————	————	————	————
6	MAR / Offset Drilling (VEMA)	11	8	-	-
7	MAR / Offset Drilling (MARK)	11	8	-	-
8	Alboran Sea evolution (#399)	————	————	————	————

Ocean History Panel (OHP)

FY93 Rank	Key title	Global Ranking 1991		Global Ranking 1990	
		global	*N. Atl.	global	*N. Atl.
1	NAAG	1	1	1	1
2	NJ / MAT	2	2	2	2
3	CR	4	3	————	————
4	NARM (volc.)	10	5	-	-
5	EAT	-	-	-	-
6	NARM (non-volc.)	10	5	-	-
7	AB (#323)	-	-	11	4

Sedimentary and Geochemical Processes Panel (SGPP)

FY93 Rank	Key title	Global Ranking 1991		Global Ranking 1990	
		global	*N. Atl.	global	*N. Atl.
1	NJ / MAT	4	2	5	1
2	MS	2	1	————	————
3	Amazon fan	————	————	————	————
4	MR	16	7	-	-
5	TAG	14	6	11	3
6	CR	12	5	————	————
7	AB (#323)	-	-	-	-
8	VICAP	5	3	-	-
9	NAAG	-	-	-	-
10	NARM (volc.)	-	-	-	-
11	MAR / Offset Drilling	-	-	-	-
12	EAT	-	-	-	-
13	NARM (non-volc.)	-	-	-	-

• "LITHP recommends that a TAG-DPG be set up immediately (whether or not drilling is scheduled in FY 93) to:

- examine all available data to determine the locations of appropriate drilling sites and their priorities.
- consider the structural controls on the hydrothermal systems and determine how to address them through drilling."

• see Agenda **Item M.1.d.** above.

Additional program-specific (down to rank 5) comments from the 10 /91 minutes:

• re: TAG (rank 1) - see recommendation on forming DPG above.

• re: MAR (rank 3) - see Agenda **Item M.1.d.**

• re: VICAP (rank 5) - "LITHP recognizes that the concept explored..., i.e., determining ocean basin evolution by studying reverse stratigraphy in clastic aprons, is very powerful and an interesting idea...it is not clear that this is the best location for this study...the contemporaneous volcanism on all the [Canary] islands will not allow resolution of the volcanism associated with each island:

- biostratigraphy may be difficult
- seismic data suggest there are some large slumps
- it may not be possible to distinguish between material originating on different islands due to subaerial input
- there may be a sampling bias towards the more explosive rock types, which are the less voluminous."

b. TECP - also made a recommendation to PCOM, see Agenda **Item M.1.d.**

Additional program-specific (down to rank 5) comments from the 10 / 91 minutes:

• re: NARM (ranks 1 and 2) - "The panel members generally felt that the volcanic rifted margins were more well-studied than non-volcanic rifted margins...primary interest with volcanic rifted margins seems to be history and evolution of the plume and its interaction with crustal formation processes...Regarding the non-volcanic rifted margins, the Iberian side seems especially well prepared and ready for drilling."

• re: EAT (rank 3) - "...TECP reaffirmed its strong interest in the tectonic objectives of this proposed leg and continues to believe that this area is the best location to carry out a study of transform margins...Major concern was expressed that the proposal includes deep-drilling objectives amounting to 2-3 legs...We suggest that drilling time estimates (using the ODP guidelines) be assembled and that the proposal be divided into legs and prioritized."

• re: AB (rank 4) - "The proposal would benefit greatly from being combined with 399 (rank 9)."

(The PCOM chair notes that the same suggestion was made by LITHP.)

• re: K/T boundary / Gulf of Mexico (rank 5) - "The question of plume-generated eruptions vs. impact as a triggering mechanism of plate motion has been raised in the case of the Indian Ocean, and the question is possibly of even more general importance. Everyone...is interested in the nature of major extinction events. The journalistic importance of this proposal is extremely high, and *the proposal could be the most important site that ODP can drill.*" [italics added]

c. OHP - made the following recommendation to PCOM:

• re: NAAG (rank 1) - "NAAG [DPG] recommended two legs be devoted to this program and that they be separated by a year so that they can both be drilled in the optimum weather window so as to maximize the chances of obtaining the northernmost sites...the panel would prefer to see a two-year gap between the two drilling legs...*OHP recommends (assuming NAAG I is scheduled for summer 1993) that PCOM set up a DPG to meet early in 1993 and again almost immediately after NAAG I ends to finalize a program for a second leg that can be considered at the fall 1993 OHP and PCOM meetings for drilling in summer 1995.*" [italics added] (Potential PCOM response to this suggestion will be taken up under Agenda **Item Q.**)

d. SGPP - only their ranking was available at the time of assembly / mailing of this Agenda Book. Full SGPP minutes will be available at the meeting.

e. SSP - Before proceeding to actual planning of the FY 93 schedule, the PCOM chair requests that the SSP chair report to PCOM on SSP assessment of "maturity" of NAP programs (also see SSP minutes).

4. Summary of Priorities / Planning the FY 93 Drilling Schedule

a. Given the thematic panel rankings summarized above, PCOM (with advice from Panel Chairs) will have to develop a ~five (5)-leg program for FY 93, which could include a leg specifically dedicated to engineering / technical development. What should the rationale for doing that be? As he did last year, the PCOM chair can make a few suggestions:

• Drill each thematic panel's highest priority science: Four different programs are ranked #1 by the four thematic panels: TAG (by LITHP), NARM / non-volcanic - leg 1 (by TECP), NJ / MAT (by SGPP) and NAAG - leg 1 (OHP). Total: 4 legs of drilling, which does not take into account NARM-DPG's request for a leg in both volcanic and non-volcanic settings during FY 93.

If panels' #2 ranks are included, the following additions can be made: NARM/volcanic - leg 1 (by LITHP and TECP), MS (by SGPP) and NJ / MAT (OHP). Total: only two (2) additional programs (NJ / MAT is the #1 choice for SGPP), for a total of 6. All six programs could be accommodated, if PCOM were willing to schedule (tentatively) approximately two (2) legs into FY 94 (see below). However, if #2 priorities are themselves ranked, clear preferences fall to a second leg of NARM (the expressed goal of the DPG for FY 93) and to NJ / MAT (because of multidisciplinary support, see below). As regards the MS program, PCOM must bear in mind the question of "maturity" (see Agenda **Item M.3.e.**).

• Drill important multidisciplinary objectives, with priority as a secondary concern: Only one program, NARM / volcanic - leg 1, received a ranking in the "top 5" from three thematic panels (LITHP, TECP, OHP). Four programs received a "top 5" ranking from two panels: EAT (by TECP, OHP), NARM / non-volcanic - leg 1 (by TECP, LITHP), NJ / MAT (by SGPP, OHP) and TAG (by LITHP, SGPP).

(The PCOM chair notes that if top panel priorities [above] are cross-referenced against multidisciplinary choices, three (3) programs emerge: NARM / non-volcanic - leg 1, NJ / MAT and TAG)

• Drill something "new": Only two "new" (i.e., non-NAP programs) were given a "top 5" ranking: Amazon fan (#3, by SGPP) and K/T boundary / Gulf of Mexico (#5, by TECP). Of the two, the former appears to be more "mature", but the latter carries a great deal of potential "impact" (sorry). Should a "new" program supplant programs which have survived (a) global ranking procedure(s)?

b. A suggested schedule (which takes into account drillship efficiency and known weather window limitations, for which the PCOM chair takes full responsibility - neck in the noose time again):

Leg	Approx. Months	Notes	Suggested Program
148	Jan 93-Mar 93	no NAAG-NJ / MAT	TAG* [LITHP #1]
149	Mar-May	"	NARM (n.v.) [TECP #1]
150	May-July	no NAAG	NJ / MAT [SGPP #1]
151	July-Sep	NAAG I here	NAAG I [OHP #1]
152	Sep-Nov	no NAAG-NJ / MAT	NARM (v.)* [LITHP/TECP #2]
153(?)	Nov 93-Jan 94	"	EAT (?)^ Ceara Rise(?)^ Amazon fan(?)^ K/T boundary(?)^ others(?)

*possible second at-sea deployment of DCS Phase IIB (pending - Leg 142)
^equatorial/low-latitude programs offering maximum flexibility for projected FY 94 drillship operations, which will span the entire Atlantic region (plus adjacent seas / eastern Pacific after April 1994, as per the 4-year plan set in April 1991)

(Approximately 3:30 PM) Coffee Break

Item N. Detailed Planning Requirements - 1992 PCOM Meetings

1. Spring meeting, 21-23 April 1992 (Corvallis).

a. The primary purpose of this meeting is for PCOM to decide the general direction of the vessel for the 4-year period to spring 1996:

• **By mid-April**, PCOM members must receive, in their Agenda Books, **annotated** lists by each of the four thematic panels of their current global ranking of programs.

• The JOIDES Office must receive these lists from thematic panels no later than **1 April**.

• No later than **early March**, the thematic panels will have had to (a) review new and appropriate older proposals from any ocean, in terms of published thematic objectives and the probability of actual drilling (related to scientific and technical maturity of a proposal, including existing or anticipated surveys, engineering developments, safety, and perhaps other factors); (b) assemble acceptable proposals into programs; (c) rank and list those programs; and (d) briefly annotate each program with its thematic objectives and other appropriate comments to guide PCOM. In order to assess and monitor the evolving technical "maturity" of acceptable programs, interaction of thematic panels with DMP, SSP, and TEDCOM is essential. In this regard, the PCOM chair encourages the service panels, particularly SSP, to meet far enough after the thematic panels to make informed statements about program "maturity" in time for input to PCOM. This timing should be observed for both fall and spring meetings of panels. Issues of proposal / program "maturity" become paramount in the fall, prior to the Annual Meeting of PCOM with Panel Chairs (see below).

• As soon as the 4-year general direction for the drillship is set, PCOM must assign watchdogs for each highly-ranked program likely to be a drilling candidate which is not already covered. All PCOM watchdogs should be prepared to report to PCOM at the August meeting.

b. At this meeting, PCOM will also receive initial reports from any new DPGs created at this meeting (if any, see Agenda **Item Q.**), and interim reports from the OD-WG (DPG?) and SL-WG. Input from DPGs / WGs is essential for thematic panels to conduct a proper global ranking of proposals in ~March.

ACTION Are these arrangements satisfactory and clear? Does PCOM want to make any adjustments, in consultation with Panel Chairs that remain?

2. Summer meeting, 11-13 (?) August 1992 (Canada).

a. One important purpose of this meeting is preparation for the 1992 Annual Meeting, at which the FY 94 drilling program will be constructed.

• PCOM should receive and discuss watchdog reports, DPG / WG reports, and other information pertaining to possible candidate programs for FY 94 drilling, which should begin in the Atlantic, but after April 1994 will include adjacent seas and the eastern Pacific. Programs that might be in regions visited by the drillship early in its 4-year general progress will be examined most closely, but even potentially later ones must be discussed.

b. PCOM will also hear reports from formally constituted liaison groups at this meeting, and attempt to accommodate those programs where constructive overlap with expected drilling activities occurs.

ACTION Are these arrangements satisfactory and clear? Does PCOM want to make any adjustments, in consultation with Panel Chairs that remain?

3. Annual Meeting, late November - early December (exact dates to be determined at this meeting) 1992 (probably Bermuda).

a. Review of procedures involving PCOM, thematic panels, and other parts of the JOIDES structure.

b. The primary purpose of this meeting is preparation of the Science Program (drilling plan) for the FY 94 drilling schedule.

- As was true this year, PCOM members and Panel Chairs will receive **no later than early fall 1992** the equivalent of a "prospectus", including: relevant DPG / WG reports, candidate programs for FY 94 presented in leg form, including objectives, thematic / service panel comments and rankings from Spring 1992 meetings, and wherever possible, their specific sites, drilling and logging times, and whatever else is needed for PCOM evaluation and decision.

- Unless PCOM has an objection, the "FY 94 Prospectus" will be assembled during the spring / summer of 1992 by the JOIDES Office. Ideally, this document should include programs (and perhaps a candidate engineering leg) totalling ~7-10 legs, from which ~5-6 will be selected for FY 94. This prospectus should receive additional thematic / service panel review and comment during Fall 1992 prior to the Annual Meeting.

- See comments above about timing of thematic vs. service panel meetings (Agenda Item N.1.a.)

ACTION Are these arrangements satisfactory and clear? Does PCOM want to make any adjustments, in consultation with Panel Chairs that remain?

Saturday, 7 December 1991 (8:30 AM)

Item O. Membership on JOIDES Panels

1. As in the past, this Agenda Book will list necessary actions but not nominees. A separate set of pages will be handed out in Austin to PCOM members including nominees and vitas (if available). PCOM members are reminded to bring documentation (a short biography) for their own nominees to fill panel vacancies. The JOIDES Office will have prepared overheads summarizing each panel's membership and any necessary action items.

a. LITHP

• J. Phipps-Morgan is rotating off, and G. Smith will be rotating off after the spring 1992 meeting. The panel "recognizes the need for an individual with expertise in modeling." Three nominees have been brought forward (see the minutes), although none have as yet indicated their willingness to serve.

b. TECP

• Three members (K. Klitgord, M. Purdy and D. Sawyer) are due to rotate off. TECP would like to keep Purdy and Sawyer for one more meeting, and both are willing. Possible replacements for Klitgord are listed in the minutes, in priority order - two Canadian and two U.S.

• TECP also feels itself "deficient" in two areas: "physical mechanisms of deformation" and "collisional-small ocean basin questions", and has nominated slates of candidates (in priority order) to fill out that expertise. *(The PCOM chair reminds PCOM that TECP already consists of 17 members.)*

c. OHP

• N. Shackleton will be stepping down as chair (and rotating off OHP) after this meeting. The next chair must be nominated, and OHP has supplied a nominee who is willing to serve.

• A. Mix and B. Berggren are due to rotate off. Nominees (both primary and secondary) to replace them have been forwarded to the JOIDES Office.

d. SGPP - no information available at the time of Agenda Book mailing.

e. DMP

• D. Karig is due to rotate off. A nominee, to fill a perceived panel weakness in "*in-situ* stress", has been forwarded to the JOIDES Office

f. IHP

• No action necessary at this time.

g. PPSP

• No action necessary at this time.

h. SMP

• Both A. Richards and B. Whitmarsh are due to rotate off, and should be replaced by nominees by ESF and the UK, respectively. *(PCOM members from those partners take note!)*

• SMP would like to add a sedimentologist. *(Note: SMP currently has only 10 members.)* At the time of mailing of this Agenda Book, nominees had not been received.

i. SSP

• S. Lewis and H. Meyer are due to rotate off. Nominees from the U.S. to replace Lewis will be supplied at the meeting. *(Germany has nominated a replacement for Meyer.)*

• Consensus #24: "SSP recommends to PCOM that the term of membership of its Panel date from first attendance and that terms for SSP members be 4 years rather than 3 years to allow for the full progression of a set of proposals during their stewardship." *(The PCOM chair supports this suggestion, with a view to maintaining corporate memory on this data-intensive body.)*

j. TEDCOM

• No action necessary at this time.

2. ACTION PCOM should discuss and decide panel membership appointments and related matters, and incorporate all membership changes in a single motion.

(Approximately 10:00 AM) Coffee Break

Item P. Other Personnel Actions

1. Co-chief scientists. Nominations for Leg 147 (Hess Deep) and for legs placed on the FY 93 schedule should be given to the Science Operator.

2. Panel liaisons. PCOM liaisons to panels, DPGs and WGs (see Agenda **Item Q.**) should be updated/nominated as necessary. PCOM liaisons to late winter meetings of thematic panels, DPGs and WGs should be confirmed.

• Any general change of PCOM liaison responsibilities (see table)?

	EXCOM	LITHP	OHP	SGPP	TECP	DMP	IHP	PPSP	SMP	SSP	TEDCOM
J. Austin	*							*			
K. Becker						*					*
M. Cita-Sironi				*?					*?		
D. Cowan [?][1]						\ *					
R. Duncan			*								
H. Jenkyns			*								
Y. Lancelot							*			*	
M. Leinen [?][2]									*		
J. Malpas		*									
B. Taylor											
J. Mutter		*									
J. Natland [?][3]											*
A. Taira					*						
B. Tucholke					*						
U. von Rad				*							
J. Watkins										*	

[1]may be replaced by B. Lewis, PCOM chair-designate, after this meeting
[2]has rotated off PCOM. P.J. Fox is the replacement, R. Larson the alternate.
[3]will move to Miami after this meeting. The SIO replacement on PCOM will be W. Berger.

PCOM Liaisons to DPGs and WGs:

B. Taylor	OD-WG
J. Watkins	SL-WG

Item Q. Status of Detailed Planning Groups and Working Groups

1. North Atlantic Rifted Margins DPG.

a. NARM-DPG has presented its "final" (?) report to PCOM at this meeting.

b. ACTION PCOM should decide whether to disband NARM-DPG.

2. Sea Level WG.

• SL-WG has now met twice. It is envisaged that a third, and final, meeting will take place in June 1992 (see minutes of 11/91 meeting included with this Agenda Book). No further PCOM action required at this time.

3. Offset Drilling WG.

a. OD-WG has met once (see the minutes attached to this Agenda Book). As a result of that meeting, PCOM authorized the inclusion of MAR / OD proposals in the NAP.

b. PCOM should consider the LITHP / TECP recommendation re: future functioning of the OD-WG (see Agenda **Item M.1.d.**). Should its next meeting [February 1992] be devoted to Atlantic programs? Should its purpose be shifted from defining a general OD strategy (which makes it a WG) to prioritizing an OD approach using specific proposals (which would make it a DPG)?

c. ACTION PCOM should respond to the LITHP / TECP suggestion, either by directing the OD-WG to continue to develop a general OD strategy (PCOM's original intent) or by changing the OD-WG mandate so that the group can define a specific program for OD drilling in the Atlantic (OD-WG becomes OD-DPG).

4. Possible New DPGs

a. <u>re: TAG</u> - should PCOM set up a DPG to consider drilling details related to this program (see LITHP minutes and Agenda **Item M.1.d.**)?

b. <u>re: NAAG</u> - should PCOM set up another NAAG-DPG ("NAAG, too"?) to deal with a phased approach to North Atlantic Arctic work (see the OHP minutes), or wait until the outcome of NAAG I?
(The PCOM chair is in favor of waiting.)

Item R. Future Meetings

1. The 1992 Spring PCOM meeting will be hosted by R. Duncan at Oregon State University, College of Oceanography, from 21-23 April 1992. A one-day field trip will be held on Monday 20 April, preceding the meeting, in the Coast Ranges (in all weathers). Attendees can fly to either Eugene or Portland and arrangements will be made through Allison Burns at JOI, Inc. to collect people at airports.

2. The 1992 Summer PCOM meeting will be hosted by J. Malpas, probably in <u>Newfoundland</u>, Canada. In August, Tamaki noted that IGC and the Asian Marine Geology Conference conflict with the proposed dates (18-20 August). He suggested 11-13 August. Austin said that he would check with Malpas. A field trip may be held following(?) the meeting.

ACTION PCOM should firmly set the dates and venue for its 1992 Summer Meeting. *(Note: J. Malpas should come to this meeting with details of this meeting, including modified dates, venue and field trip.)*

3. The 1992 PCOM Annual Meeting will probably be held at the Bermuda Biological Station (BBS), Bermuda, hosted by the University of Miami, Rosenstiel School of Marine and Atmospheric Sciences in November / December. The PCOM chair has been in contact with the conference coordinator at BBS, and details concerning the facility, costs, etc. are attached to this Agenda Book. PCOM usually meets during the week preceding AGU (AGU will be held on 7-11 December 1992).

ACTION PCOM must decide on the venue and dates for the 1992 Annual Meeting at this meeting.

4. ACTION PCOM could / should set the dates and venue for its Spring 1993 Meeting:

• This meeting should be held in the U.S., probably at LDGO. (LDGO was initially to have hosted the 1992 Annual Meeting, but that meeting was switched to Miami / Bermuda for obvious reasons related to climate.) *(Note: For PCOM's information, JOI institutions that have not hosted a PCOM meeting over the past four years (i.e., by 1992) are TAMU and LDGO.)*

5. ACTION PCOM could / should set the dates and venue for its Summer 1993 Meeting.

• This meeting should be held outside the U.S. Recent PCOM meetings held outside the U.S. include: Oxford, U.K. (Summer 1988), Oslo, Norway [ESF] (Spring 1989); Paris, France (Spring 1990); Hannover, Germany (Summer 1991); Canada (Summer 1992). Possibilities include Australia, Japan and the Soviet Union).

(Approximately 12:00-1:00 PM) Lunch(?) (PCOM may opt to push through to wine and cheese, which cannot be held at the Thompson Center, but will require a shift of venue to the Radisson Hotel. The PCOM chair is open for discussion on this, and whether or not a break for lunch is scheduled can be decided based upon the morning's progress.)

Item S. Other Business

1. Formation of a "steering group" (WG?) to monitor implementation of the "Report of the JOIDES Working Group on <u>In-situ</u> Pore Fluid Sampling".

a. At its 10/91 meeting, DMP reviewed (and endorsed) the report of the *ad hoc* group named above (see Agenda **Item E.1.**) and made the following recommendation (91/17, see the minutes):

> A steering group should be formed to direct the implementation of the Working Group Report on *In-situ* Pore Fluid Sampling. The steering group should comprise representatives of LDGO, TAMU, DMP and SGPP, with a PCOM liaison. The group should properly represent the areas of geochemistry, downhole measurements, and drilling and tool engineering. The steering group should meet as soon as (OPCOM) funds become available in order to progress the initiative and to contribute to the design of a request for proposals for a feasibility study. It should meet again to evaluate and decide upon the resulting bids. The group should meet a third time to review the output

of the feasibility study. [For proposed composition of the group, see the DMP minutes, p. 13.] Day-to-day supervision of appointed consultants and contractors should be the responsibility of ODP-TAMU.

b. ACTION PCOM should decide whether or not to follow up on this recommendation (see also the joint resolution by LITHP and TECP on this issue, section 5.1 of their joint minutes). *(The PCOM chair suggests that this group could meet as part of regularly scheduled DMP meetings in 1992.)*

2. Formation of a WG to review all ODP hardware / software systems.

a. At its 9/91 meeting, IHP suggested the following:

That PCOM establish a WG with participants from IHP, SMP, and DMP, and advised by an external consultant to undertake an in-depth external review of hardware and software systems (both ship- and land-based) with a view to determining the best possible future direction for ODP computing and data handling consistent with the objectives of the LRP.

b. ACTION PCOM should decide whether or not to follow up on this recommendation.

3. Procedures for obtaining advice on equipment purchases.

a. This issue was raised by T. Pyle, following a conversation with R. McPherson of ODP-TAMU. *(The PCOM chair requests that T. Pyle be prepared to fill PCOM in on exactly what kind of input is required.)*

b. ACTION PCOM should be prepared to make a statement to ODP - TAMU on this issue, once it has been clarified by JOI, Inc.

4. ACTION items postponed from earlier parts of the meeting.

Item T. Adjournment

SUMMER MEETING JOIDES PLANNING COMMITTEE
20 - 22 August, 1991
Bundesanstalt für Geowissenschaften und Rohstoffe
Hannover, Germany

REVISED DRAFT MINUTES
(November 15, 1991)

Planning Committee (PCOM)

J. Austin, Chairperson - University of Texas at Austin, Institute for Geophysics
M. Cita-Sironi - University of Milan (ESF Consortium)
D. Cowan - University of Washington, College of Ocean and Fishery Sciences
T. Crawford (for J. Malpas) - University of Tasmania (Canada-Australia Consortium)
W. Curry (for B. Tucholke) - Woods Hole Oceanographic Institution
R. Duncan - Oregon State University, College of Oceanography
H. Jenkyns - Oxford University (United Kingdom)
Y. Lancelot - Université Pierre et Marie Curie, Paris (France)
J. Mutter - Columbia University, Lamont-Doherty Geological Observatory
J. Natland - University of California, San Diego, Scripps Institution of Oceanography
A. Sharaskin - Geological Institute, Moscow (USSR) (August 21 and 22, only)
P. Swart (for K. Becker) - University of Miami, Rosenstiel School of Marine and Atmospheric Science
K. Tamaki (for A. Taira) - Ocean Research Institute (Japan)
B. Taylor - University of Hawaii, School of Ocean and Earth Science and Technology
U. von Rad - Bundesanstalt für Geowissenschaften und Rohstoffe (Germany)
J. Watkins - Texas A&M University, College of Geosciences

Liaisons

T. Francis - Science Operator (ODP-TAMU)
X. Golovchenko - Wireline Logging Services (ODP-LDGO)
B. Malfait - National Science Foundation
T. Pyle - Joint Oceanographic Institutions, Inc.

Performance Evaluation Committee

F. Goerlich - Germany

Guests and Observers

H. Beiersdorf - Bundesanstalt für Geowissenschaften und Rohstoffe (Germany)
M. Kürsten - Bundesanstalt für Geowissenschaften und Rohstoffe (Germany)
D. Maronde - Deutsche Forschungsgemeinschaft (Germany)
N. Pisias - Oregon State University, College of Oceanography
G.M. Purdy - Woods Hole Oceanographic Institution

JOIDES Office (University of Texas at Austin, Institute for Geophysics)

P. Blum - Executive Assistant and non-US Liaison
C. Fulthorpe - Science Coordinator

000002

SELECTED ACRONYMS AND ABBREVIATIONS

ARC	Australian Research Council
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe
BGS	British Geological Survey
BHTV	Borehole Televiewer
BIRPS	British Institutions Reflection Profiling Syndicate
BMR	Bureau of Mineral Resources
BRGM	Bureau de Recherches Géologiques et Minières
BSR	Bottom-Simulating Reflector
CSDP	Continental Scientific Drilling Program
CSG	Computer Services Group (ODP)
DCS	Diamond Coring System
DFG	Deutsche Forschungsgemeinschaft
DP	Dynamic Positioning
DPG	Detailed Planning Group
ECOD	European (ESF) Consortium for the Ocean Drilling Program
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
ETH	Eidgenössiches Technische Hochschule
FDSN	Federation of Digital Seismic Networks
FMS	Formation Microscanner
FY	Fiscal Year
GSGP	Global Sedimentary Geology Program
IDAS	Isothermal Decompression Analysis System
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer
IGBP(/PAGES)	International Geosphere/Biosphere Program (/Past Global Changes)
ILP	International Lithosphere Program
IOC	Intergovernmental Oceanographic Commission
IPR	Intellectual Property Rights
IRIS	Incorporated Research Institutions for Seismology
JAMSTEC	Japan Marine Science and Technology Center
JAPEX	Japan Petroleum Exploration Company
JGOFS	Joint Global Ocean Flux Studies
KTB	Kontinentales Tiefbohrprogramm der Bundesrepublik Deutschland
LANL	Los Alamos National Laboratory
LAST	Lateral Stress Tool
LBL	Lawrence Berkeley Laboratory
LRP	Long Range Plan
MCS	Multi-Channel Seismic
MDCB	Motor-Driven Core Barrel
MOU	Memorandum of Understanding
MRC	Micropaleontological Reference Center
NADP	Nansen Arctic Drilling Program
NAS	National Academy of Science
NERC	Natural Environment Research Council
NSERC	National Scientific and Engineering Research Council
OBS	Ocean Bottom Seismometer
ODPC	ODP Council
ONR	Office of Naval Research
OPCOM	Opportunity Committee
OSN	Ocean Seismic Network
PCS	Pressure Core Sampler
PDC	Poly-crystalline Diamond Compact (drilling bit)
PEC	Performance Evaluation Committee
PPI	Producer Price Index
RFP	Request for Proposals
RIDGE, InterRIDGE	Ridge Inter-Disciplinary Global Experiments (US and International)
SCM	Sonic Core Monitor
SES	Sidewall-Entry Sub
SNL	Sandia National Laboratory
SOE	Special Operating Expense
STA	Science and Technology Agency (of Japan)
STRATCOM	Strategy Committee
USSAC	US Scientific Advisory Committee
USSSP	US Science Support Program
VPC	Vibra-Percussive Corer
WCRP	World Climate Research Program
WG	Working Group
WOCE	World Ocean Circulation Experiment
WSTP	Water Sampler, Temperature, Pressure (downhole tool)

FY92 Programs:

A&G	Atolls and Guyots
CA	Cascadia margin
CTJ	Chile Triple Junction
EPR	East Pacific Rise
HD	Hess Deep
NPT	North Pacific Transect
504B	(Deepening) Hole 504B

DPGs and WGs:

A&G-DPG	Atolls and Guyots DPG
NAAG-DPG	North Atlantic-Arctic Gateways DPG
NARM-DPG	North Atlantic Rifted Margins DPG
OD-WG	Offset Drilling WG
SL-WG	Sea-Level WG

SUMMER MEETING JOIDES PLANNING COMMITTEE
20 - 22 August, 1991
Bundesanstalt für Geowissenschaften und Rohstoffe
Hannover, Germany

EXECUTIVE SUMMARY

PCOM Motions

PCOM approves the minutes of the 23-25 April, 1991 PCOM meeting (p. 5).

PCOM adopts the agenda for the 20-22 August, 1991 PCOM meeting (p. 6).

Upon evaluation of the three supplemental science proposals we have received, PCOM ranks the potential science return of S-3 (OSN-2) the highest. Therefore, PCOM will consider only S-3 for scheduling in FY92 (p. 32).

PCOM moves to discontinue the practice of accepting "Supplemental Science" proposals (as defined by its motion and consensus of December 1990). However, continued submission of proposals requesting less than 1 leg of drilling is encouraged. Such proposals will be ranked in accordance with normal ODP review procedures (p. 35).

PCOM endorses the plan for allocation of incremental funding recommended by OPCOM as modified by PCOM (see minutes for 21 August 1991). To make the funds available in a timely manner, PCOM recommends that the spending plan be passed to BCOM for their consideration prior to their scheduled meeting (i.e., early 1992) (p. 39).

PCOM endorses the concept of drilling one rotary core site in the lagoon at Enewetak Atoll for the purpose of testing the drilling capability of *JOIDES Resolution* in shallow water. The duration of this test, including deviation from the proposed (legs 143/144) track, should not exceed 60 hours (p. 41).

PCOM moves that supplemental science proposal S-2 (to log Hole 801C) be incorporated in the prospectus of legs 143/144 (Atolls and Guyots) as an alternate site, and that the appointed co-chief scientists consider logging at Hole 801C, which has a considerable scientific merit as recognized by the thematic panels and by PCOM, if time is available (p. 41).

PCOM reaffirms the critical importance of the development of GEOPROPS, or tool of comparable capability, as an integral part of scientific planning. PCOM further recommends that OPCOM funds be made available as soon as practicable to further this aim. PCOM anticipates that a suitable tool could be tested on Leg 146 (p. 44).

PCOM endorses all personnel actions taken at the August meeting (p. 53).

PCOM recommends that proposals which have not been updated for three full calendar years before the present calendar year (i.e., January 1, 1988 for 1991 activities, to roll to January 1, 1989 on January 1, 1992 for 1992 activities) be declared formally "inactive". Thematic panels will be given the directive by the JOIDES Office not to review inactive proposals formally, but rather to initiate submission of proposal updates (as per revised Proposal Submission Guidelines, published in the June 1991 *JOIDES Journal*) from proponents if there is sufficient panel interest. The community will be informed about this change in policy through the *JOIDES Journal* (see additional documentation in the August minutes). (p. 59.)

PCOM Consensuses

In order to decide at the Annual Meeting whether to reserve a maximum of 10 days during Leg 145 for drilling a re-entry hole, OSN-2, paired with NW-1A (Supplemental Science Proposal S-3), PCOM asks the thematic panels and co-chiefs for Leg 145 to determine which sites would be modified or dropped to accommodate up to 10 days at OSN-2 (p. 35).

PCOM thanks Erwin Suess, who is leaving the chairmanship of the youngest thematic panel of ODP (SGPP), for his dynamic, intelligent and dedicated leadership (p. 51).

Addition to OPCOM recommendations

(This addition displaces the original OPCOM recommendation 4 to recommendation 5 and the original recommendation 5 to 6.)
4) Recognizing the long-standing commitment of the scientific community to develop the means of drilling holes 4-6 km deep in 2-5 km of water, PCOM recommends that JOI, Inc. use the most effective route to commission a feasibility study to accomplish such drilling, based on target specifications now being prepared by the several thematic panels. PCOM anticipates a funding level of $0.1M in each of FY92 and FY93 for this item. (p.38).

Summer Meeting JOIDES PCOM
Tuesday, 20 August 1991

905. Welcome and Introduction

PCOM Chairperson Austin called the 1991 Summer Meeting of the JOIDES Planning Committee to order. Von Rad introduced President Dr. M. Kürsten, of BGR, who welcomed the attendees to Hannover. Kürsten noted that BGR has a long history in Marine Geology. BGR's status has recently increased due, in large part, to international cooperation in projects such as ODP, which BGR has strongly supported. With reunification, East German scientists will now be able to participate in ODP.

Von Rad explained meeting logistics and plans for the Harz Mountains field trip following the meeting. He introduced H. Beiersdorf (BGR) and F. Goerlich (PEC III), and informed PCOM that D. Maronde (DFG) would arrive on Wednesday and host a reception on Wednesday evening. Von Rad also introduced U. Röhl and E. Brockmann (BGR), who would provide logistical support. Austin then called for introductions around the table. He noted that there would be no representative from the University of Rhode Island, Graduate School of Oceanography, since Schilling (alternate for Leinen) had returned to the US to attend to hurricane damage to his home.

906. Approval of Minutes of 23-25 April, 1991 PCOM Meeting

Austin called for comments, corrections and approval of the minutes of the 23-25 April, 1991 PCOM Meeting held at Narragansett, Rhode Island. The minutes included modifications through August 2, 1991. Mutter commented that appendices did not accompany the revised draft minutes. Fulthorpe replied that this has been the standard practice. Appendices are sent out only once: with the draft minutes. There were no further corrections.

PCOM Motion

PCOM approves the minutes of the 23-25 April, 1991 PCOM meeting.
Motion Natland, second Watkins Vote: for 14; against 0; abstain 1; absent 2

907. Approval of Agenda

Austin stated that one purpose of the meeting was to hear reports from liaisons to other geosciences programs, though success in attracting liaisons had been minimal. He added that Purdy would give his report later than scheduled in the agenda. PCOM would also consider modifications to the near-term program, OPCOM recommendations, format/content of the FY93 North Atlantic Prospectus, a geriatric study of ODP proposals, third-party tools and GEOPROPS in particular, and the issue of PCOM members as co-chiefs. He added two items to the agenda: nomination of a chair for the PANCHM meeting and a report on PEC III by Goerlich. Austin called for further additions.

Swart suggested discussion of standardizing procedures for voting on proposals by thematic panels. Two points should be addressed: voting method and maturity of proposals considered. Blum suggested that this might come up during the report on the geriatric study. Austin said that it would be taken up under "New Business". In response to a question from Francis, Austin confirmed that the proposed test of *JOIDES Resolution's* shallow-water drilling capability, during the A&G legs, would be discussed under "Adjustments of Near-Term Program". Von Rad proposed discussion of of co-chief selection, including balance of US and non-US co-chiefs and the inclusion of proponents. Austin called for adoption of the revised agenda.

PCOM Motion

PCOM adopts the agenda for the 20-22 August, 1991 PCOM meeting.
Motion Watkins, second Natland Vote: for 15; against 0; abstain 0; absent 2

908. ODP Reports by Liaisons to PCOM

NSF

Malfait reported that increases requested for NSF in FY92 total 17.5%. (Actual congressional actions are listed in Appendix 1.) The US House of Representatives passed an amount slightly less that was requested and the Senate passed an amount reduced somewhat further ($2645M). Elements of uncertainty were the current political situation in the USSR (where a coup was in progress) and the space station, which was not included in the budget that was passed. In addition, the Senate recommended that the Defense Department should support logistics for the Antarctic program. Budget problems could result if this recommendation is not taken up and NSF has to provide support. These matters should be finalized in September.

The budget for ODP Operations and Management Support was submitted at $41.4M. The $2.1M OPCOM increment will be evaluated later (Appendix 1). A 4-year program plan is needed this year (1993-1996). The budget guidance that NSF has given JOI, Inc. for the 4-year plan is consistent with LRP projections. Additional platforms will have to be considered. (Appendix 1 contains a timeframe for activities and funding to the end of 1993 and lists of FY91 and FY92 field programs.) Some other proposals are still under consideration for FY92.

Discussion

Natland, noting the decision to plan using LRP budget projections, questioned the accuracy and meaningfulness of those projections. Responding to a question from Mutter on the doubling of the Instruments and Facilities budget by the Senate (Appendix 1), Malfait said that the Senate wants to see construction of new university buildings. Austin asked why the NAS review of the LRP, which had been described as imminent a year ago, had not yet taken place. Malfait replied that there was some concern that NAS will not be able to conduct a timely review. Austin went on to say that an NAS review had been one of STRATCOM's strongest recommendations, and that it was unfortunate that this had not happened. Pyle felt that NAS had said that they would conduct the review by March 1992, but Malfait said that was uncertain.

JOI, Inc.

Pyle noted that the FY92 budget, augmented by the OPCOM increment, is close to the LRP projection. (Appendix 2 shows LRP budget projections to FY2002.) FY98 marks the end of the current lease on *JOIDES Resolution* and a possible date for a change to a different platform (or platforms). Projections are based on the assumptions listed in Appendix 2 (average annual cost increase of 3.7%). Uncertainties in the post-1993 financial requirements of ODP are: inflation assumptions, engineering and technical developments (Appendix 2), SOEs (H_2S

safety, ice support vessels), *JOIDES Resolution* lease in 1998, alternate platforms (number, cost, management), and science trends and new discoveries.

Liaison groups have now been established with GSGP, FDSN, NAD, Inter-RIDGE and JGOFS. No liaison exists with IGBP/PAGES. (Other interactions, with groups involved in continental and high-temperature drilling, are listed in Appendix 2.)

The FY92 Program Plan (Appendix 2) was approved by EXCOM at its meeting on 9-11 July in La Jolla. (FY92 SOEs are summarized in Appendix 2.) It had been necessary to set aside $0.125M as unspecified. FY92 SOEs total 4.6% of the combined ODP-TAMU and ODP-LDGO budgets, exceeding the 4% minimum.

(The present status and recent past of ODP, from a program management perspective, are summarized in Appendix 2.)

Discussion

Crawford stated that the Canada-Australia Consortium will decide on renewal in the next 2 months and asked whether any increase in international partner contributions was planned. Malfait replied that a proposal to increase such contributions by 7% was discussed by ODPC at its July meeting. Francis noted that only the LANL sampler will be available on Leg 139.

Lancelot commented on liaisons with other geosciences initiatives. He said that the best liaisons are people involved in both programs. Formal liaisons are less effective. The main problem with IGBP is that no ODP people are involved in that program. The best way to interact with other programs would be to mount joint operations or write proposals together. However, Austin felt that formal liaisons encourage informal interactions. Pyle remarked that inter-program liaison has been initiated to achieve two objectives: 1) to increase communication, and 2) to dispel the notion that ODP is an "old boys' club". Austin pointed out that more liaisons had wanted to come to this meeting, but had been prevented from attending by conflicting schedules. Taylor suggested having liaisons attend a PCOM meeting other than the August meeting in order to minimize such conflicts. Austin felt that such action was not yet necessary, but might have to be considered if the situation did not improve.

SCIENCE OPERATOR

Francis began his report by pointing out that he would discuss Leg 137 in his engineering report later in the agenda.

Only one multi-shot camera was aboard at the start of Leg 138, Eastern Equatorial Pacific (the other 2 had been with the manufacturer for maintenance and failed to make the Panama port call). Permission was obtained from Ecuador for both drilling of EEQ-4 and a stop at the Galapagos Islands for the extra multi-shots. Drilling progressed so rapidly that an extra site (850) was chosen and it was also possible to drill an additional, alternate site (854) at the end of the leg (Appendix 3). Approximately 5537 m of core were recovered, exceeding the previous record set on Leg 133 by 19 m. The XCB performed very well; ~1700 m of core was recovered with an average recovery of 93% and no disturbance (Appendix 3). Carbonates with a siliceous component seemed to be ideal for the XCB. Pisias added that holes had been double-XCB'd at 2 sites and that high-resolution sampling was now possible with the XCB in the right lithology.

Francis continued, noting that the Macintosh visual core description program had been used for the first time "in anger" on Leg 138. This is a barrel sheet program that enables on-board production of publishable barrel sheets (Appendix 3). The BUGIN program, for computerizing biostratigraphic data, outputs range charts. It was a preexisting program for IBM-type computers. A Macintosh version was developed and this was tested on Leg 138, but did not work. Swart asked why the IBM version was not used, and Francis replied that most shipboard scientists are Macintosh-oriented, so this was a more user-friendly solution. In response to a question from Cita-Sironi, Pisias said that all cores were opened and described aboard ship.

Francis reported that a great deal of work had to be done during the 6-day San Diego port call, including modifying the air-conditioning system to provide over-pressure in the labs and adding H_2S detectors. In addition, a large number of visitors took advantage of the ship's first return to the US mainland.

JOIDES Resolution was now drilling at Middle Valley on Leg 139 (Sedimented Ridges) (Appendix 3). Plans to leave an instrumented, cased reentry hole at MV-7, the first site and comprising a transect of holes, were dropped. At the next site, MV-2 (an 8-hole transect), massive sulfides were recovered. The sulfides are very dense and it was difficult to clear cuttings. A drill-in casing with a free-fall funnel was deployed. Thicker sediment was encountered at MV-3. The maximum temperature was 110°C, but no major H_2S was encountered. Site MV-1 is in an active vent field. High temperatures were expected (Appendix 3), but not encountered. The first H_2S alert occurred here, but the H_2S was in the core liner and it was not a problem in the lab. The Sandia logging tool was run and lost. The Adara tool (temperature sensor in the APC shoe) was working well. The WSTP tool (Appendix 3) had been rebuilt for Leg 139: 196°C was measured at 20 mbsf in Hole 858B (Appendix 3). Subsequently a maximum of 208°C was measured in Hole 858D. The first 2 runs of the PCS (Appendix 3) were unsuccessful, but the next 3 runs recovered 0.5 m core under pressure, water (no core) under pressure and core under pressure with gases, respectively. The PCS now seems to be a working tool. Hole 857C is a cased, reentry hole: 568 m was drilled and cased, then the hole was left to equilibrate. Subsequently, it was deepened and "corked". Two corked reentry sites will be achieved by the end of Leg 139.

Discussion of the engineering aspects of Leg 140 (504B/HD) will be covered in the engineering report. Guidebases, etc, for HD will be aboard. (Co-chief scientists and other personnel for legs 140-146 are listed in Appendix 3.)

No problems with clearance are expected for Leg 141 (CTJ). Two Chilean scientists and a Chilean Navy observer will be aboard. Leg 141 marks the first instance of permission being given to drill through a BSR. The strategy will be to work upslope from the deepest site, following a progressively strengthening BSR. Emphasis will be placed on the use of the PCS and WSTP tools.

Leg 142 (Engineering EPR) will be discussed in the engineering report.

Legs 143 and 144 comprise the A&G program. Leg 144 will be the first leg to have 2 women co-chiefs. An engineering test of the capability of the *JOIDES Resolution* to drill in very shallow water has been proposed. The test will be conducted at Enewetak and could be conducted on either Leg 143 or Leg 144.

Francis went on to discuss the selection of co-chief scientists, about which there has been some criticism. The position after Leg 142 was as follows: if the allocation of co-chiefs were to be in balance by the end of calendar year 1992, the international partners were owed 8 co-chiefs with only 4 legs (143-146) remaining unfilled (Appendix 3.15). Rather than appoint no US co-chiefs, however, it was decided to invite 3 from the US and 1 each from ESF, Germany, Japan, UK and USSR. The Japanese scientist declined the invitation; the co-chief from Germany subsequently withdrew because there was no proponent co-chief on Leg 145. Austin interjected that the letter of withdrawal had been most eloquent, expressing the feeling that the scientific objectives of the leg would be better served if one of the co-chiefs were a proponent. He felt that ODP owes the individual concerned a debt; his name should be brought up again for nomination as a co-chief on an appropriate future leg.

The outcome of this round of co-chief invitations, Francis continued, was that 5 US and 3 international partner co-chiefs were appointed. Looking to the situation at the end of calendar year 1993, with co-chiefs now in place up to and including Leg 146, ODP owes the international partners 12 co-chief positions, since there are now 7 international partners (Appendix 3.17). The situation is also affected by the fact that since 1989 there has been 1 engineering leg/year with only 1 co-chief scientist, who to date has always been US.

In response to a question from Duncan, Austin said that the MOU expectation is that international co-chief balance will be averaged over 1 year. Malfait pointed out that the MOU specifies that co-chiefs need only be invited, for purposes of international balance, and need not necessarily serve. He added that ODPC is ready to consider averaging over time periods of >1 year. Natland felt that engineering legs should not be included in the tally. Lancelot suggested rewording MOUs to balance participants and not co-chiefs. Choice of co-chiefs must be based on science. Malfait responded that ODPC did not express that view and had supported continuing co-chief representation as expressed in the present MOU. Cita-Sironi suggested appointing 3 co-chiefs/leg to alleviate the problem. Crawford supported Lancelot's statement and encouraged flexibility and balance over longer periods. Jenkyns stated that the UK view is similar. UK might accept a trade-off of co-chief positions for extra shipboard scientists. Von Rad stressed that one co-chief on each leg should be a proponent.

Francis continued his report with a discussion of staffing. Legs are staffed to Leg 144, inclusive. ODP-TAMU is waiting for some international nominations for legs 145 and 146. Nominations should be sent to A. Meyer at ODP-TAMU. The number of scientists/leg is generally ~25-30 (Appendix 3). The record is 31 on Leg 138. ODP-TAMU would like to maintain the number at 26-27 (including the ODP staff scientist and ODP-LDGO logging scientist). (Staff changes at ODP-TAMU are summarized in Appendix 3.) Staff scientist M. von Breymann has left and been replaced by R. Musgrave, who will sail on Leg 141 (on which von Breymann will be a shipboard scientist). The major turnover is among seagoing technical support, whose turnover rate is ~1/month. In response to a question from Mutter, Francis said that seagoing technicians generally burn out after ~3 years. Responding to Swart, Francis said that ODP-TAMU might be looking for staff scientists soon and that nominations should be sent in. Finally, Francis reported that Initial Reports to Leg 132 and Scientific Results to Leg 118 have been published.

WIRELINE LOGGING

Golovchenko began by noting that Leg 137 had a limited logging program. The plan had been to run a temperature log, BHTV to examine both casing and open hole conditions, flowmeter for permeability measurements, and FMS (never before run in Hole 504B). In reality, the temperature log was run, as was the BHTV inside the casing (Appendix 4). Only a short section of open hole was examined with the BHTV, the flowmeter failed, and there was no time for the FMS run. The temperature log shows that downhole flow of cold water has increased. Natland commented that temperature measurements made on successive visits to Hole 504B show that downhole water flow first decreased and has now increased again.

Golovchenko characterized Leg 138 as a very successful logging leg. A total of 2500 m of hole was logged, involving 7300 m of logs (Appendix 4). Correlation of log and GRAPE densities was performed aboard ship for the first time. Correlation was better with HPC core than with XCB core. This was the first leg with true core-log integration, the result of improved data transfer and better coordination between the ODP-LDGO and the JOIDES logging scientists. The scientific party received logging data before logging was completed. Comparison of core and log gamma, resistivity and susceptibility records is not yet possible, since there are no core gamma measurements or core resistivity measurements comparable with the highest-resolution log resistivity (FMS), and no log susceptibility tool. Calcium content correlated with density on Leg 138.

Leg 139 required a great deal of preparation because of the use of specialty and high-temperature tools. Schlumberger was out in force to evaluate tools at the San Diego port call.

The latest French (BRGM/Plastelec) tool, rated to 500°C, was not ready for Leg 139. The Sandia tool is rated to 350°C, and the Kuster tool (also 350°C) was purchased as a back-up. The JAPEX tool has been leased, but downgraded to 230°C. The logging winch heave compensator was removed at San Diego and the effects of heave will, therefore, be seen in the logs. The highest temperature measured on Leg 139 to date has been 222°C (using the Sandia tool) at Site 857. At Site 858, 196°C was measured at 20 mbsf. In response to a question from Pyle, Golovchenko explained that logging is being carried out using the SES with continuous circulation; this might be reducing temperatures.

Golovchenko went on to discuss personnel matters. The departure of R. Jarrard was imminent. Advertisements for a replacement will be placed in *Eos* and *AAPG Explorer*. The international partners have also received copies of the advertisement. Applications will be reviewed at the end of September. In the meantime, M. Lyle is filling in for Jarrard. Austin asked that Golovchenko remind R. Anderson that ODP-LDGO should have a representative at the PCOM Annual Meeting. Golovchenko added that ODP-LDGO will also be hiring 3 others: a programmer/systems manager, an additional log analyst and a replacement for a log analyst (who has accepted a program coordinator position).

A new Masscomp computer has been purchased at 20% of the list price. The latest version of the log analysis package has been received. It is very user-friendly and will cut down on the training of JOIDES logging scientists. ODP-LDGO has a space problem and has leased a trailer with 3 offices. A request for a second trailer for tape storage has been turned down by LDGO administrators.

Discussion

Cowan asked whether the packer problem on Leg 137 was significant. Golovchenko replied that there was no apparent reason why it deflated. It was in casing at the time. Austin added that the tool is back on Leg 139. In response to a question from Pyle, Golovchenko said that the reason for the failure of the BHTV was also unknown. Austin recalled that ODP-LDGO had had problems filling logging requests with the available staff and asked about the current situation. Golovchenko explained that Leg 137, which produced few logs, had provided a useful respite and that ODP-LDGO had almost caught up with requests. Additional staff would be hired soon.

909. JOIDES Reports by PCOM Liaisons

EXCOM

Austin reported that EXCOM had met jointly with ODPC in La Jolla on July 9-11. The joint meeting is usually in June, but was moved to coincide with the San Diego port call.

Individual perspectives on renewal were discussed. The prospects for renewal to 1998 are positive, but there is less agreement about the second 5 years of a philosophical 10-year renewal, and particularly about whether *JOIDES Resolution* or other platform(s) would be used post-1998. EXCOM has finally begun to address the alternate platform issue, raised initially as a French initiative. A 1-person sub-committee was nominated to report to EXCOM on the subject in January. Austin added that he would touch on this issue again during his report on OPCOM.

EXCOM endorsed the FY92 Program Plan, with a caveat regarding Leg 147 (though Leg 147 is technically not in FY92). Austin wrote the motion (Agenda Book blue pages 7-8). Leg 140 had become an "either/or" situation because of junk left in Hole 504B at the end of Leg 137. In addition, DCS III will not be available for Leg 147. Both of these points fed into the motion. Mutter asked whether the "bottom line" was that Leg 147 would be HD. Austin replied that HD has to be addressed, but that if Leg 140 is HD, Leg 147 might not be HD.

Responding to a question from Duncan about EXCOM's interest in drilling the lower crust and upper mantle, Austin said that, at the October 1990 EXCOM meeting, some members had wanted to see exciting scientific results. This discussion took place earlier in the renewal process. EXCOM reiterated its October 1990 motion at its July 1991 meeting (Appendix 5). However, Austin stated that it is not clear that PCOM would have followed EXCOM's advice in this matter if the HD proposal had not arisen. There was some feeling on EXCOM that PCOM should heed EXCOM's advice, regardless of other factors. Austin felt that EXCOM (and LITHP) would rather see a single hole through the entire oceanic crust ("Mohole") than an offset approach, but Pyle disagreed that EXCOM had expressed that opinion clearly. Cowan asked how PCOM was supposed to find sites for Mohole drilling without proposals. Austin replied that this was merely an example. EXCOM wants PCOM to respond to exciting developments. A proposal to investigate a possible K/T boundary impact site, to be submitted soon, will probably rise through the system like HD.

EXCOM feels that the LRP is a good document, but an inadequate implementation plan. EXCOM wants PCOM to consider focussing ODP.

Taylor asked why, if DCS III would not be available for Leg 147, EPR still formed part of the FY92 Program Plan motion. Austin explained that he had retained the reference to EPR because nothing has been received in writing about the status of DCS III. In response to a question from Lancelot, Austin said that it was his sense that deep drilling at EPR should not proceed with DCS II, but should await DCS III. Natland added that the ODP-TAMU engineers have said that they would only drill one leg at EPR with DCS II (its elevated drilling platform is a safety concern). Duncan said that DCS II is also very slow and Lancelot added that, therefore, Leg 147 should not be EPR. Responding to a question from Natland, Francis said that it was necessary to push on to DCS III. Further drilling with DCS II after Leg 142 is not desired.

Austin continued his report, noting that EXCOM had endorsed PCOM's motion about the size of DPGs. He added that EXCOM is concerned about PCOM's role and requests that PCOM consider the appropriateness of PCOM members serving as co-chiefs. EXCOM is neutral on this issue, but would like to get PCOM's feelings. Austin pointed out that non-US members have often served longer on PCOM than US members and might be disadvantaged if not allowed to serve as co-chiefs for the whole period of their membership on PCOM. Cita-Sironi asked about support on EXCOM for this idea. Austin replied that C. Dorman had raised the issue, but that there was wider support. Others had felt, however, that such a policy might discourage the best people from serving on PCOM. Lancelot felt that having PCOM members as co-chiefs was not a problem as long as the procedure for choosing co-chiefs was well-defined and based on science. Austin said that EXCOM and ODPC were sympathetic to rewriting MOUs on international participation as co-chiefs. They supported having proponents as co-chiefs. EXCOM is interested in PCOM's philosophical stance, and is not asking for PCOM action at this time.

Pisias stated that ODP-TAMU appoints co-chiefs. He feared that to disallow PCOM members would discourage people from joining PCOM. Austin informed PCOM that Francis would write an article on co-chief selection for the next issue of the *JOIDES Journal*. It seems that much of the community is ignorant about how it is done. Von Rad noted that EXCOM had felt that ODP-TAMU should choose co-chiefs from the lists of names presented by PCOM. Francis said that this usually happens, but that when international balance is required, ODP-TAMU approached the international PCOM member concerned for a nomination. Von Rad and Austin proposed that the PCOM chair, at least, should be involved in the process. Lancelot agreed. However, Francis pointed out that ODP-TAMU has the authority to choose co-chiefs. Mutter felt that there was potential for conflict of interest when proponents on PCOM might be chosen as co-chiefs and that this also applied to panels. Austin recalled that proponents left the room during pertinent parts of the discussion at the April PCOM meeting. The issue of institutional representation was also considered in deciding on that course of action. Austin said that the issue of co-chief selection would be discussed further under New Business.

SMP

Austin informed PCOM that Cita-Sironi was the PCOM liaison to SMP, though she had not been at the last SMP meeting. The full SMP minutes were included in the Agenda Book (white pages 59-74). He asked if there were any SMP items that PCOM wished to discuss.

Regarding levels of technical staffing on the drillship raised by SMP, Natland reported that the issue had also been discussed at the Co-Chiefs' Meeting. Concern was expressed about the size of the shipboard party. Austin, referring to Francis's graph (Appendix 3), commented that shipboard parties are not increasing as rapidly as had been thought.

Cita-Sironi asked whether the digital image scanner had been used on Leg 138. Pisias replied that it had not: only core reflectance had been measured.

PPSP

Austin said that he had not attended the PPSP meeting. He asked it there were any questions based on the minutes (Agenda Book, white pages 75-78). In the absence of further discussion, Austin reported that he was encouraging early completion of updated safety guidelines, on which PPSP continues to work.

DMP

Becker (not present at PCOM) had attended DMP's last meeting as PCOM liaison. Austin said that two points arose for consideration: 1) testing of GEOPROPS cannot now be conducted on Leg 141, opening up the question of whether a test of the MDCB is necessary on that leg, and 2) DMP's recommendations regarding the logging program for Leg 140 should be repeated to ODP-LDGO and the co-chiefs.

Taylor felt that the Leg 140 recommendation amounted to changing the program for that leg after the fact. However, Golovchenko explained that this was something discussed at the pre-cruise meeting that somehow was omitted from the prospectus.

Lancelot enquired about the DMP recommendation to increase the number of re-entry holes drilled, adding that this would take time. Austin replied that ODP must respond to proposals and he did not think that PCOM should make a statement on this matter. He reminded PCOM that DMP is an advisory panel, not a thematic panel. Taylor said that such recommendations must come in early enough for PCOM to consider them along with scientific objectives. This would avoid any need to take time away from drilling programs which have already been defined. Austin commented that this is related to focussing of ODP. If PCOM decides to focus ODP, proponents of proposals may become less important.

Crawford pointed out that there was no "subduction zone off Tasmania", as stated on p. 7 of the DMP minutes (Agenda Book, white page 89). He requested that this be changed to "Southern Ocean". The change was noted.

SGPP

Swart reported that SGPP had carried out a global ranking in March. Then, 5 categories of proposals had been created and proposals ranked within each group. The global ranking was created by voting first on the top proposal in each group, then subsequently on the top proposal remaining in each group after successive rounds of voting. Proponents left the room until their proposal had been removed from a voting position. This meant that some were out of the room for most of the time, and some peculiar ranking resulted. Austin interjected that Moberly had always characterized the voting of SGPP as very fair. Swart responded that he had the impression that this was a new system and he did not like it, since the results depended greatly on who was at the meeting. Natland stated that the SGPP method had been in use for at least one year.

At its June meeting, SGPP decided that the voting method adopted for its March global ranking had been unfair and decided on a second vote. This vote was initially to include all proposals, but, following further discussion, it was decided to consider only North Atlantic proposals. Austin pointed out that the top five proposals in March had remained high in SGPP's new, North Atlantic ranking, but that below that level there had been much change (Appendix 6). Swart agreed, noting that the Barbados proposal had moved from 17th to 3rd.

(Note: in the draft minutes it was incorrectly reported that E. Suess, then SGPP chair, was a proponent of the Barbados proposal considered for ranking. Suess is not a proponent of proposal 378-Rev (Barbados accretionary wedge). The JOIDES Office sincerely regrets the implication that anyone on SGPP deliberately influenced the ranking of any proposal.)

Lancelot emphasized that rankings should drive the drillship, rather than the reverse. Austin asked how much guidance PCOM should give the thematic panels. Discussion was required. PCOM has given guidance that ranking should be global. He, therefore, asserted that the new regional ranking should be ignored. Swart stated that the two top-ranked programs in the original ranking were not even mature proposals. Austin countered that generic programs were placed in the global ranking as place holders, an acceptable practice. They would be ignored when creating the North Atlantic Prospectus (see minutes, p. 54). The issue is the desirability of a regional ranking, which Austin opposed. Mutter added that voting procedures should also be addressed. Austin replied that in the past this had been left to the panels, but Mutter felt there was a need for some uniformity. Austin stated that, so far, PCOM has said that ranking should be global and that proponents must not vote. PCOM should now discuss the issue further. Von Rad reported that he had spoken to N. Christie-Blick, an SGPP member, who had explained that, given that the *JOIDES Resolution* would spend 2 years in the Atlantic, SGPP wanted to state its preferences. SGPP would, however, stick to its global ranking at other meetings.

Austin noted that the SGPP chair had given responsibility for writing minutes of the June meeting to a member. The JOIDES Office then had difficulty obtaining the minutes in time for inclusion in the Agenda Book and the minutes received were incomplete. Austin said that he would like PCOM to voice its concern: input from the panels is needed on time. Von Rad felt that delegation of minute-writing should be allowed. Austin agreed, but stressed that the chairperson must be responsible for getting the minutes in on time.

Swart continued his report by noting that the June meeting of SGPP had been held in conjunction with DMP. A fluid sampling workshop was to be held in Houston immediately following the present (August) PCOM meeting. SGPP heard two presentations on potential deep drilling targets in the Somali Basin and Aleutians (drilling from an island). SGPP felt that these projects would be too expensive. SGPP also discussed OPCOM priorities and the Gas Hydrates Workshop, held in conjunction with the March SGPP meeting. The workshop report was felt to be insufficiently thorough and will be rewritten. SGPP decided to solicit proposals for drilling gas hydrates in the Atlantic by placing an advertisement in the *JOIDES Journal*.

SGPP would also like to explore obtaining permission to drill in the Red Sea. Swart concluded his report by proposing that PCOM pass a motion thanking Suess for his chairing of SGPP.

North Atlantic Rifted Margins Detailed Planning Group

Von Rad reported that NARM-DPG had its second meeting, lasting 5 days, in Copenhagen the week before the PCOM meeting. NARM-DPG had a difficult task, covering volcanic and non-volcanic margins. It considered 7 proposals at its first meeting and 5 additional proposals, mostly from the Greenland Geological Survey, at its second meeting. Its report is due by mid-September, for incorporation into the North Atlantic Prospectus.

Transects are envisaged at the following conjugate margins: Newfoundland to Iberia Abyssal Plain (non-volcanic) and Greenland to Rockall (volcanic), together with a mini-transect on the Voring Plateau (volcanic) (Appendix 7). NARM-DPG was a well-balanced group and Larsen was a good chair, though it was a good idea for PCOM to appoint Sawyer a co-chair for the second meeting, especially because of the number of Greenland Geological Survey proposals (for which Larsen was a proponent). Von Rad expected that NARM-DPG's recommendations will lead to ODP conducting much more basement-oriented drilling in the future.

Blum, who had also attended NARM-DPG, continued the report. He pointed out that a great deal had been sorted out at the first meeting. At the second meeting, 5 new proposals were considered and some new members were present. By the third day, a consensus had been reached. The philosophy of drilling conjugate margins was felt to be less important for volcanic margins, where radial transects were believed to be more appropriate to test plume models.

The transect strategy and site objectives for these volcanic margins were summarized (Appendix 7). The Voring margin is the same distance from the proposed plume as one of the Greenland transects. Mutter asked why, in that case, it was necessary to drill at both locations. Blum replied that their volcanic wedge morphologies differ.

The transect strategy and site objectives for non-volcanic margins were also summarized (Appendix 7). Some additional seismic data are required to plan the Newfoundland Basin sites. Austin commented that a cruise to collect such data is scheduled for summer 1992.

Blum reported that NARM-DPG will suggest 1 volcanic margin leg and 1 non-volcanic margin leg for FY93. NARM-DPG placed importance on examination of results of these first legs before proceeding with further drilling. Mutter asked whether there was an intention to drill a very seaward site at the east Greenland margin to provide a reference site in normal oceanic crust. Blum replied that this had not been felt necessary. Responding to a question from Cita-Sironi, Blum reiterated that NARM-DPG had felt radial transects would be more important than conjugate drilling on volcanic margins. Answering Francis, Blum said that the deepest hole to be drilled would be 2.5 km. Mutter asked whether drilling through the S-reflector was planned. Blum replied that NARM-DPG felt that the S-reflector was too deep to be drilled at its best-imaged occurrence.

Offset Drilling Working Group

Taylor reported that OD-WG grew out of a workshop 2.5 years ago at Woods Hole on drilling the lower crust and upper mantle. One of the recommendations of that workshop was to hold a further workshop to study offset drilling.

OD-WG studied global offset drilling objectives and took a long-term view (1993-2000). The highest priority is the layer 3/mantle transition (Appendix 8). The strategy is to combine 4 sections to give a complete section at both fast- and slow-spreading ridges. The drilling program is expected to involve ~12 legs, at 1000±500 m of penetration/leg. The global priority regions for fast-spreading ridges are: HD (still the highest priority), MARK, Vema FZ, and Atlantis II FZ/Hole 735B (Appendix 8). All 4 regions are ready for first-stage drilling. Other regions are on-line for slow-spreading drilling (e.g., 15°20'N in the Atlantic, and King's Trough, also Atlantic). Fast-spreading alternates are needed, e.g., Pito Deep, Endeavour Trough. No region has been sufficiently surveyed for a 4-leg "total section" to be drilled. No drillable principal transform deformation zone (PTDZ) has been identified.

While gabbro is drillable with current technology, many objectives have engineering implications: DCS is needed for the Layer 2/3 transition, slimhole logging tools are required, guidebases for 35° slopes are necessary (27° is the current theoretical limit and 20° is a more reasonable practical limit), and drill-in casing will be needed.

Offset drilling will involve enhanced site survey requirements. Outcrop scale geological maps, with real dips, will be needed for work beyond first-stage drilling. This is beyond the scope of present site surveys.

OD-WG will ask for additional meetings in February and May, 1992. A report on the first meeting will be available by mid-September, 1991. OD-WG would like this report to be treated similarly to a DPG report and be included in the North Atlantic Prospectus. Austin said that could be discussed later in the meeting.

Natland, who had also attended OD-WG, added that ~20 different locations had been evaluated world-wide based on a number of factors. These included: the presence of components of the total vertical section, presence of a median valley "master fault", plume vs. none-plume origin, proximity to a fracture zone, hydrothermal processes, logistics, site survey data, etc. The locations were ranked from 0 to 3 and this is how the 4 highest-priority, fast-spreading regions were identified. The ranking was not based on proposals. The next meeting will focus on evaluation of data. Natland concluded with a "personal note", remarking that offset drilling is now at a stage comparable with paleoceanography at the introduction of the HPC. The potential exists to make a great scientific contribution..

Discussion

Cowan asked how the chances of drilling crustal transitions can be improved, given limited site survey data. Natland replied that the layer 3/mantle has not been completely defined, but that some places are known where it must be. Responding to questions from Mutter and Watkins, Taylor said that the guidebase problem (i.e., stabilizing it at steep dips) should be solvable. Natland commented that suggestions for solving the guidebase problem included: making 1 leg longer than the others, an improved gimbal system, and anchoring with concrete. As a "reality check", Pyle cautioned that neither a working DCS nor slimhole logging tools exist. Taylor responded that OD-WG would downplay the layer 2/3 transition objective until DCS III is ready and focus on other objectives. OD-WG would prefer full-sized holes to slim holes.

Von Rad noted the lack of site survey data, adding that OD-WG should provide guidance. Taylor responded that the last page of their report will be devoted to this issue. The top 4 regions have the best site survey data, though 3-dimensional data are lacking. Francis pointed out that DCS II is limited to a drill string of 4500 m, but Taylor said that all locations are within the capabilities of the *JOIDES Resolution*. Responding to a question from Tamaki, Taylor explained that the term "master fault" refers to faulting creating median valley topography. "Transform fault" implies mylonite zones and movement. Natland confirmed that the layer 2/3 transition at HD is accessible by DCS. Austin asked whether OD-WG's request for 3 meetings was acceptable to PCOM. There were no objections.

INDIAN OCEAN SYNTHESIS

Duncan explained that the purpose of the Indian Ocean synthesis meeting, held over 3 days in Cardiff, UK, was to review the 9-leg Indian Ocean ODP program and recast the results in terms of the thematic objectives of COSOD II and the LRP. Attendees were divided into thematic groups. A preliminary report is included in the Agenda Book (white pages 139-147). A firm contract has been arranged with AGU to publish the 27 papers proposed at the meeting. Drafts are to be submitted by November and the volume is scheduled for publication late in 1992, soon after the Indian Ocean scientific results volumes. The volume is expected to contain 800-900 pages.

Discussion

Taylor asked whether the proposed papers had been listed before or after discussions with AGU. Duncan replied that a preliminary list had been in hand during negotiations with AGU. In response to a question from Swart, Duncan said that the editors would be himself, von Rad, R. Kidd, and J. Weissel. Von Rad suggested that other former regional panels might wish to discuss achievements in their respective regions. He asked whether any plans for such syntheses existed. Taylor, answering on behalf of the old Western Pacific panel, said that there had been some discussion and a meeting might be held in October 1992.

PERFORMANCE EVALUATION COMMITTEE III

Goerlich reported that PEC III comprises 8 members, 5 US and 3 international. It has met three times this year, in Austin, College Station, and San Diego, and will meet in September at ODP-LDGO and JOI, Inc., and again in November in Switzerland to write up their report.

Topics addressed have included co-chiefs and MOUs, overcrowding of the *JOIDES Resolution* with instruments and people, and the decision-making of PCOM ("top-down" vs. "bottom-up" philosophy). There has been some discussion of whether the *JOIDES Resolution* should be considered an investigation tool for paleoceanography for 2 years while a tool for deep crustal drilling is made ready. PEC III has considered splitting ODP in the long-term future and creating "think-tanks" to consider the main targets of deep crustal drilling. Technology development would take place while soft-rock drilling proceeds. However, splitting ODP involves technological, financial and political considerations. ODP should consider such long-range planning.

Discussion

Austin noted that these were preliminary ideas and that PEC III had not yet produced its report, which was not due until early January. Mutter asked whether publication of ODP volumes had been addressed. Goerlich said that it had, but that he could not comment at present. Francis asked about the timeframe for splitting ODP. Goerlich responded that it was envisaged as occurring ~1998.

GENERAL PANEL ISSUES

Austin asked whether PCOM wished to pass a motion about timely submission of panel minutes. Watkins and Lancelot felt that this was not a matter for PCOM, but should be dealt with by the JOIDES Office. Natland also felt that no further action was required. Lancelot stated that he did not like singling out Suess (SGPP chair), who has done a great deal for ODP.

Swart suggested that PCOM should not decide on the question of whether to ignore SGPP's regional ranking without a vote. Austin responded that the new ranking was not mandated by PCOM and it was not clear how SGPP reached its ranking. Cowan agreed that the ranking was not requested: PCOM is still interested in global rankings. Austin stressed that PCOM's task is to agree on proposals for inclusion in the North Atlantic Prospectus. Taylor said that, in that case, the second SGPP list was unnecessary. Natland suggested reviewing this problem when considering the prospectus. The new ranking exists and PCOM can deal with it at that time. Austin pointed out that the other three thematic panels would be angry if this additional ranking was allowed to stand. Lancelot said that PCOM could not ignore the ranking, but must be precise. PCOM can say that it understands SGPP's point of view, but for several reasons PCOM cannot include the new ranking in its deliberations.

Natland said that PCOM cannot be sure that it received a global ranking from the panels, a point he had raised at PCOM's last meeting. Generic programs are a problem. Blum stated that the global rankings are the input to the system. Proponents are informed of these rankings and to change rankings at this stage would turn the system upside down. However, Swart responded that SGPP had felt that the problem was with their first ranking and not the second, though he acknowledged that it had been a mistake not to make the second ranking global. Lancelot said that PCOM should be open to SGPP's view that they made a mistake with their first ranking.

Austin pointed out that the two rankings are fairly consistent if only the top 7 proposals are considered. However, there is one glaring anomaly. Lancelot observed that the global ranking had already been used to set the direction of the drilling vessel and, therefore, suggested now allowing SGPP to change their minds. Austin pointed out that SGPP's rationale for its ranking had not been explained in the SGPP minutes and again highlighted the anomaly of a proposal (Barbados) rising from 17th to 3rd. Blum explained that the Barbados proposal, in successive rankings, had gone from 10th, down 7 to 17th, then up 10 to 3rd (Appendix 6 and Appendix 9, which compares the 1990 and 1991 global rankings for LITHP, OHP and TECP, as well as SGPP). Cita-Sironi said that the thematic panels have a great deal of power and they should, therefore, rank only once per year. Austin stressed the need to prevent regional panel thinking from resurfacing.

Swart said that, during SGPP's voting for global ranking in March, their "fluids" category contained 9 proposals. Barbados was nominally 7th within that group, but only the top and bottom proposals in the group were chosen, and the middle group were simply thrown in. However, their order ended up making a big difference in the ranking because of SGPP's voting system. Austin said that the JOIDES Office will remind panels about consistency in ranking. EXCOM also wants that.

Austin said that he would have to ask for a PCOM consensus that SGPP's regional ranking be disregarded, since the new ranking was neither requested nor explained and was not done by the other thematic panels. Mutter remarked that, in that case, a true global ranking was needed. Taylor suggested discussing Barbados as a special case when deciding on the prospectus. He did not like making it 3rd, or leaving it 17th. Austin predicted that the other thematic panels would object. Lancelot declared that if SGPP is unanimous in now thinking Barbados should be more highly ranked, PCOM has to allow that. However, he added, if its rise in the ranking is only an artifact of the voting procedure, to change would be dangerous. Natland said that, in the end, he agreed with Austin. SGPP will have the option to re-rank proposals next year. Austin said that they would also be able to reconsider proposals at their scheduled November meeting.

Jenkyns commented that the New Jersey sea level and Mediterranean sapropels proposals had been reversed in the new ranking. Swart responded that Mediterranean sapropels was not, in any case, a mature proposal. Cowan said that he echoed Lancelot in that panels should be allowed to change their minds, but that the scientific basis for any change must be made clear. Austin read the relevant section of the SGPP minutes (Agenda Book, white page 125). Lancelot agreed that the scientific basis for the change was not explained. Austin declared that the minutes would reflect that, in this instance, an invalid and unsolicited ranking had been produced.

910. Reports of Co-Chairs (or representatives) of Liaison Groups

Austin proposed not to discuss further the written reports from liaisons which were included in the Agenda Book: GSGP (white pages 149-151), NAD (white pages 153-167) and JGOFS (white pages 169-172). Reports from FDSN and InterRIDGE liaisons were expected to be heard later in the meeting.

911. Engineering Report

Francis began his report with a discussion of the status of Hole 504B following Leg 137 (Appendix 10) and plans for cleaning the hole on Leg 140. He noted that the bottom of Hole 504B is now at 5096.5 mbsl (1621.5 mbsf) and that the round trip time for pipe tripping is 18 hours. He added that vigorous circulation must be avoided to maintain hole stability.

Milling was successful and Hole 504B was drilled ahead with a tricone bit, retaining boot baskets because there was still some metal in the hole. Two RCB cores were then taken, with 17% and then 10% recovery. The second RCB was very worn (Appendix 10), indicating hard, abrasive rock. A diamond core barrel (DCB) was deployed and bit wear was severe. A second DCB wore out rapidly and the outer part of the core barrel was found to have broken off, leaving an 18.5 m length in the hole. Impregnated diamond core bits proved unsatisfactory for drilling in this lithology and, since a harder matrix cannot be obtained, RCBs will have to be used in future drilling at Hole 504B. During a subsequent fishing attempt, the overshot was lost. That junk (Appendix 10) will have to be fished on Leg 140. Taylor commented that the ideal fishing tools were not available on Leg 137.

Francis explained that the strategy on Leg 140 will be to try a number of fishing attempts with different fishing tools. During the first 36-48 hrs. temperature and FMS logs will be run. Then the following sequence of fishing attempts will be followed: another overshot (~1 day), spearing device (~1 day), taper tap (~1 day). If these fishing efforts fail, it is planned to mill

(~1 week). After 5 days, it will be known whether milling will be necessary. Clearing the hole of junk will take ~1 week beyond that.

Austin stated that if fishing fails, there will be a discussion among a small group of people (the co-chiefs, Francis, Pyle and Austin) to decide on the course of action to be followed. Austin stated that milling has not previously been considered as an option. PCOM is on record as recommending going to HD if cleaning attempts are unsuccessful after ~7-10 days at Hole 504B. The milling option is a new variable. The first plan was to allow only 7 days for cleaning Hole 504B on Leg 140. After polling PCOM on the issue, it was decided to increase this to 7-10 days, but there was no discussion of spending >10 days on cleaning and milling operations. Francis pointed out that the first 1-2 days will be taken up by logging, not cleaning. Austin recalled that the junk had been originally characterized by ODP-TAMU engineers as "eminently fishable". Pyle noted that JOI, Inc. must be involved in any decision about terminating operations at Hole 504B on Leg 140 and Austin confirmed that that would be the case. Lancelot said that his opinion had been either to spend the whole of Leg 140 fishing, if necessary, or to forget about Hole 504B. He did not feel that the cleaning objective could necessarily be met within 10 days. Austin explained that Lancelot had been outvoted because PCOM had believed the ODP-TAMU engineers' estimate of 1 week for cleaning. He reiterated that milling had not been previously mentioned. Lancelot said that PCOM must be fair and that the ODP-TAMU engineers are entitled to revise their judgements. Austin stated that if PCOM wished to change the time frame for cleaning at Hole 504B, the co-chiefs must be informed.

Francis continued his report, explaining that a modified C7 RCB, the C8, will be used on Leg 140. Regarding casing inspection, Francis said that the BHTV run in the casing on Leg 137 had been successful, but that the results were difficult to interpret. The casing in Hole 504B may be split near the bottom, but no problems have been encountered. Golovchenko asked who did the BHTV interpretation. Austin replied that it had been a group interpretation aboard ship. The consensus had been that there would be no problems on Leg 140, but that future attempts at Hole 504B might be affected by casing degradation.

Francis turned to the status of DCS II and plans for Leg 142. The guidebase will cope with 25° slopes and has a re-entry cone 8 feet in diameter (Appendix 10). A counterweight keeps the cone vertical. Options for casing/spudding were shown (Appendix 10). DCS II successfully passed the slingshot test, recently conducted at Dreco in Houston. Options for core barrels and core catchers were shown (Appendix 10), as was the preliminary operations plan for Leg 142. The early November deadline for surface shipping of equipment to Valparaiso can be met. Natland asked what would happen if DCS II does not work as expected early in Leg 142. Francis replied that it might be possible to drill through the rubble using rotary coring, with a smaller diameter than previously, and deploying nested casing. Austin added that this was a fundamental point. The ODP-TAMU engineers would keep trying for the whole leg, moving the guidebase as necessary. If they do not succeed, objectives at fast-spreading ridges will be limited. Francis said that an experienced diamond driller will be taken on Leg 142.

Francis reported that DCS III feasibility studies are examining 2 options: a bottom structure (to accommodate heave) and a riser option. The reports will be completed in September and discussed at TEDCOM. It was too early to be specific about cost, but the bottom type might be cheapest.

Francis went on to discuss progress on prioritization of non-DCS engineering. A redesigned XCB shoe will be tested on Leg 141. The test will not take time away from the Leg 141 operations. A more-robust RCB version of the SCM will be taken on Leg 141. It uses an electronic multi-shot device. A larger-diameter (7") version of the VPC is being examined by Novatek. Based on their analysis, ODP-TAMU will redesign ODP's smaller, but mechanically similar, VPC. Responding to a question from Pyle, Francis said that in order for Jack Pheasant (of BGS) to resume work on the VPC, he would have to be paid. In that case, ODP-TAMU would rather have him work on the breakaway piston head. The incentive to develop the MDCB was to drill pilot holes for GEOPROPS. The redesigned MDCB will be available for Leg 141, but there will be no GEOPROPS. Austin noted that that would be discussed later. He added that PCOM would also return to Leg 140 under Adjustments of Near-Term Program.

WIRELINE LOGGING

Golovchenko reported on new logging tools being developed or considered. The BRGM high-temperature (350°C) temperature tool will be on legs 140 and 141. It had originally been rated at 500°C, but had been downgraded to 350°C because of its cable.

A contract was about to be signed with Camborne School of Mines to develop the high-temperature resistivity tool. It should be available for December 1992 and Leg 147. The availability of money from the UK Department of Energy is uncertain. The total cost will be $300,000, of which ODP will provide $168,000. Both the BRGM temperature tool and the high-temperature resistivity tool will be ODP tools.

The Japanese magnetometer is a third-party tool. It will be used on legs 143 and 144 for A&G basement objectives. The magnetometer is a self-contained tool which is designed to be run at the bottom of the Schlumberger logging string. However, it is long and thin, and bridge breaking could damage it.

The wireline packer (an ODP tool) has proved inadequate. DMP felt that a complete redesign was necessary. Immediately following this PCOM meeting, a meeting on downhole fluid sampling was to be held in Houston, chaired by P. Worthington (DMP chairperson). A working fluid sampling tool would be desirable for legs 143, 144 and 146, but no such tool will now be available for at least the first 2 of these legs.

A log susceptibility tool would be useful on all legs for core-log integration. The resolution of the French susceptibility tool is too low. A new tool could be developed at a cost of ~$200,000, but its resolution (40 cm) would also be too low.

Discussion

Austin asked about the status of dewaring the ARCO tools. Golovchenko replied that most of those tools were old and in poor condition and that it would not be worthwhile to dewar them. This had been a SOE, but the money was put into the resistivity tool instead. Responding to a further question from Austin, Golovchenko explained that the original idea had been to dewar existing tools. However, it is now recognized that new tools will have to be developed, with associated long lead times.

912. SCIENTIFIC REPORTS OF RECENT DRILLING LEGS: LEG 138

Pisias reported that Leg 138 had begun on May 5 in Panama and ended on July 4 in San Diego, ~1 day early. So much time was saved on the leg that the co-chiefs eventually ran out of things to do. The prospectus plan was to drill 9 sites, but 2 extra sites were also drilled. The pipe trip times had been estimated at 10 hrs, but the efficiency of the SEDCO crew was such that this was reduced to 5 hrs. Leg 138 was also fortunate in avoiding equipment losses and extra trips. All but 3 sites were triple APC'd and 2 sites were double XCB'd. The 5.5 km of core was a record and the recovery rate was 99.9%. At all sites but one, 100% recovery of the section with the APC could be demonstrated. Double XCB drilling recovered only about 75% of the section.

Leg 138 drilled north-south transects (Appendix 3) across the equatorial current system. The record obtained extends back to ~17 Ma. No sites recorded the influence of the California Current. Pliocene sedimentation rates were low and results of Leg 138 cannot, therefore, be linked to those of Leg 108, where recovery was mostly Pliocene.

Sharp oceanographic gradients are recorded in the surface sediments and the goal of Leg 138 was to extend the record back in time. TECP had felt that the tectonics of the region were well understood. However, Leg 138 obtained the same basement age at all sites and this does not match existing tectonic reconstructions. Objectives of Leg 138 while at sea were to monitor coring to ensure recovery of 100% of the sections and to develop a high-resolution stratigraphic framework, so that sites can be interrelated. The sampling strategy for high resolution stratigraphy will be developed onshore. The scientific party wished to avoid indiscriminate sampling at intervals of a few cm, since many of the thousands of samples involved would not be useful. About 50% of the scientific party had their sampling needs filled aboard ship The remainder of the sampling will be conducted onshore.

Multi-sensor tracks, including color reflectance, were plotted on barrel sheets (Appendix 3) and as large-scale, colored charts. Color reflectance provides very high-resolution variability. (Reflectance was averaged over 2 cm circles on the split core, at spacings of 3 cm.) The shipboard Vax computer did not work well, but fortunately extra Sun computers had been brought aboard by the co-chiefs to handle the load.

The general drilling strategy was for the A hole at each site to be the mudline core. The B hole was APC'd and drilled to basement. Then the site was double APC'd (C and D holes). The D holes were not sampled aboard ship. The logging period provided an opportunity to examine results from the B hole to ensure overlap of cores. It also gave a respite to the sedimentologists, who were under great pressure to keep up with the flow of cores. Susceptibility, GRAPE and reflectance were combined for the B, C and D holes to demonstrate overlap of cores. Some gaps remained at one site, even with triple APC coring, because of heave. The XCB left more gaps. It was found that composite sections tended to be stretched (e.g., a section with a true thickness of 100 m yielded 110 m of core) for reasons which are not clear. Core-log integration was used to remove the stretch.

Magnetostratigraphy gave one level of stratigraphy. Increased resolution of sedimentation rates resulted from the continuity of the section and focussing of biostratigraphic sampling. Only one hiatus was found in Leg 138 cores.

Discussion

Austin asked about the problems with the shipboard computers. Pisias replied that the IBMs were not standard and remained unused by the scientific party. Macintosh computers were preferred. Too many processes are carried out on the Vax, which was overloaded. This problem was alleviated because extra Suns were aboard.

Cowan asked Pisias for his opinion of the suitability of an alternate platform for "routine" coring for paleoceanographic research. Pisias replied that he would have concerns about a smaller platform. Sea state affected results, even on the *JOIDES Resolution*. Furthermore, a smaller ship would need the capability to do the work and plan sampling. In response to a question from Francis, Pisias noted that the multi-sensor track can only be produced on a large ship. He added that the leg had produced ~5.5 km of core and that it would be difficult for the paleoceanographic community to handle more. Furthermore, proper site surveys are required. Therefore, Pisias questioned the desirability of giving the drill ship to the paleoceanographic community for 2 years. Lancelot suggested that this might still be feasible if, after the pioneering paleoceanographic work, the community selected, and focussed on, particular intervals.

Austin asked how many cruises like this one the paleoceanographic community could handle, even with unlimited funding. Pisias answered that he was not sure, since several groups in the paleoceanographic community were not represented on Leg 138. He noted that Leg 138 had taken 4 years of effort from the co-chiefs to date. Natland said that the same overloading of the community occurred when high rates of recovery of complex igneous rock were obtained. Austin commented that it might be argued that it was important to collect as much data as possible, put it in an archive (as NASA does), and wait for the funding to study the data at a later date. However, Pisias felt that approach would result in a great deal of waste and stressed the need to plan. He stood by the opinion expressed in the LRP that involvement of a broad-based community in ODP is best. Taylor characterized Leg 138 as a good example of bottom-up science. Lancelot said that probably only 4-5 people did most of the work and that Leg 138 did not use the whole paleoceanographic community. In any event, the paleoceanographic community would not expect to monopolize even an alternate platform for 2 years.

Natland asked about Leg 138 publications. Pisias replied that the Initial Reports would probably be published in 2 volumes. Natland remarked that Leg 138 would have a fiscal impact on publications. Taylor suggested using microfiche, but Pisias felt that this would not be a good way to display multi-sensor plots.

Goerlich asked whether the paleoceanographic community was large enough for its tasks. Lancelot responded that there is a definite lack of stratigraphers. Pisias commented that one of the coring technicians had been an illustrator and had proved very helpful in that capacity. However, the biostratigraphers had to do all of their own sample preparation. There are 3 parallel chains of command aboard the *JOIDES Resolution* and the problem is that the scientific party cannot control the technicians. Lancelot agreed that there is little flexibility built into the system. Goerlich asked whether it would help to add 2 technicians to the shipboard party. However, Francis noted the limit set by the number of berths available (51). Pisias added that the situation had not really hampered science. Natland reported that, at the last co-chief's meeting, the opinion had been expressed that there were too many things going on aboard ship to enable co-chiefs to be fully involved in the science. Mutter asked why there had been so many scientists on Leg 138 (31). Pisias replied that this was partly due to the onset of USSR participation. However, he added that it would have been difficult to have managed with fewer, without delaying processing and sampling.

Wednesday August 21, 1991

913. Report of Co-Chairs (or representatives) of Liaison Groups (continued)

FEDERATION OF DIGITAL SEISMIC NETWORKS

Purdy (JOIDES co-chair of the JOIDES/FDSN liaison committee) described the goal of establishing an Ocean Seismic Network of ~15-20 permanent, broadband ocean floor seismometers (Appendix 11). This will be a phased effort. The scientific objectives are: to enhance global coverage and resolution of tomographic images of the earth's interior, to provide for the first time pure-path observations in oceanic lithosphere to improve knowledge of the structure of oceanic lithosphere and upper mantle, to improve the ability to define source mechanisms in areas not adequately sampled and azimuthally covered (e.g., west coast of US), with subsidiary goals including studying oceanic crustal structure, providing tsunami warnings, and better understanding mechanisms of long-period noise generation in the deep ocean. The OSN-1 pilot hole (Leg 136) has served as a catalyst to the program.

FDSN was formed in 1986 to develop common standards in data acquisition, quality and location of stations. Its membership, 4 working groups and members of the JOIDES/FDSN liaison group, are listed (Appendix 11). The FDSN-OSN liaison committee met in Vienna on August 13, 1991 and discussed plans for the FDSN meeting on August 15 (Appendix 11).

The meeting also reviewed options for the use of the OSN-1 pilot hole. A French group will place a British-designed sensor in Hole 396. The system should have been proved by spring 1992 and might be placed in OSN-1. A disadvantage of this system is that it is completely dependent on the NADIA re-entry system and the submersible *Nautile*. The meeting also established the need for improved international communication. At present, the program is at the mercy of the French ship schedule. It would be preferable if, e.g., a US re-entry system could be used to deploy a French seismometer. The Japanese effort does not have funding in place at present, but they have placed a broadband sensor in the Japan Sea. They are still the only group to have deployed a working sensor, but some of the results obtained are unusual. In the US, a proposal is pending with NSF to prepare an alternative sensor; another proposal will be submitted toward the end of the year to support the necessary fieldwork. Purdy felt comfortable that OSN-1 would achieve its objectives.

The FDSN-OSN liaison committee also discussed the proposed OSN-2. Purdy informed PCOM that he is a co-proponent of the supplemental science proposal to drill OSN-2 on Leg 145 and that he did not wish to abuse his position at this meeting. However, the group strongly supported the proposal. It fills in a gap in the global system and is close to the region of intense seismic activity associated with the trenches of the northwest Pacific.

At the FDSN meeting on August 15 in Vienna, OSN-1 was enthusiastically received (Appendix 11). ODP has affiliated itself with another geosciences community. A formal resolution in support of the OSN-2 S-proposal was unanimously adopted (Appendix 11). FDSN proposed increasing the size of its representation on the JOIDES/FDSN liaison committee from 2 to 3 because of a desire to broaden international participation. Purdy suggested that JOIDES do likewise, adding that a Japanese representative would be ideal.

Discussion

Duncan asked about the status of the US wireline re-entry system. Purdy replied that F. Spiess's system had been used already as a one-off venture. The concept has been proven and the technology exists. Spiess is now converting the system into one that can be used routinely. Austin, noting that ship scheduling is always a problem, asked whether servicing the seismometers would be feasible, in light of the difficulty already encountered in scheduling placement of a seismometer. Purdy replied that servicing the full system of 15-20 seismometers once/year would require 200-250 days/year of ship time. Servicing would not be carried out by a single ship; some stations will be operated by different countries. The estimated cost of servicing will be $3-4M/year.

Natland, noting that 3 groups are developing seismometers, asked whether OSN-1 will be a test site for all 3. Purdy answered that it would, adding that alternative solutions should be explored, though better coordination is required. For example, not enough is known about the Japanese experience in the Japan Sea. Duncan asked what review process was in place to prevent someone getting a seismometer stuck and ruining the OSN-1 hole. Purdy replied that there is a JOIDES policy of review by PCOM prior to any such operation.

Mutter asked what improvement in resolution was gained by filling in one gap in the global seismometer network. Purdy answered that it depended what was meant by resolution. To gain a significant improvement, all gaps must be filled. However, for source mechanism studies, one station can have a huge effect, depending on its location. Mutter then asked whether a priority plan existed for filling the gaps in the seismometer network. Purdy replied that no such plan existed and that the current priorities are the pilot experiments, technical problems and taking advantage of opportunities to get suitable holes in place for when the technology is ready. A priority plan will be developed in the future.

Natland asked how soon OSN-2 could be used. Purdy said that it would not be within the next couple of years. The Japanese are very interested, but activity will depend on funding. Responding to a further question from Natland, Purdy said that Site 396 is a potential OSN hole. Natland asked whether that meant that no OSN proposal should be expected in the future for that part of the Atlantic. Purdy replied that he could not be certain. There are many questions to be answered concerning coupling of the sensor to the hole and water flow noise. The latter is the result of convection caused by heat from the sensor's electronics. It might mean that shallow holes (50-75 m) will be required, with the sensor cemented at the bottom of the hole. If so, Site 396 might be difficult to work with.

Taylor asked how anyone can know the best hole to drill when the best site conditions for the instrument are unknown. Purdy agreed that the characteristics of the ideal hole for seismometer deployment are unknown and would remain so until 5-10 years of data collection from several observatories (Phase 2) had been completed. The answer might vary with environment. It's a trade-off. The first guess might not be optimal, but it is a site OSN can use anyway. It is known to be essential to get into hard rock basement, but it is not known how far. Taylor asked whether it would be sufficient to simply bury an instrument in the seafloor. Purdy replied that information is needed from comparisons of the OSN-1 sensor results with those from other sensors (e.g., on land, or buried in seafloor). The answers will not be known for a long time, so the plan is to proceed with reasonable judgement.

Lancelot asked how many existing DSDP/ODP holes OSN can use. Purdy replied that only 2-3 are possibilities in areas not covered by the global seismometer network; hole conditions are questionable. Responding to a question from Beiersdorf, Purdy said that the results of the DARPA experiment (DSDP Leg 91) were useful, but were all in too high a frequency band.

Austin said that he had allowed OSN discussion to continue as it bore on the next issue, that of Supplemental Science proposals. Purdy was asked to leave the room because he was a proponent of one such S-proposal.

914. Supplemental Science Proposals

Austin recalled that Supplemental Science proposals (S-proposals) were originally discussed at the 1990 PCOM Annual Meeting in Hawaii. They were a renewal-based concept, designed to open up ODP to a broader community. PCOM passed 2 motions and a consensus advertising the possibility of supplemental science, describing the timing for submission of S-proposals, and noting that PCOM would consider scheduling up to 10 days of supplemental science during legs 141 to 147 (Agenda Book, blue pages 12-13).

There had been some concern that the system would be inundated with proposals, but only 3 were received. Austin commented that PCOM might consider what that low number meant. The aims of the S-proposals are given in the Agenda Book (blue pages 13-20). The S-proposals are all very different scientifically. All have some measure of thematic panel support.

S-1: NAVY FAN

S-1 (Appendix 12) proposes 6 days of APC coring at 3 sites, to a maximum depth of 150 m. Austin noted that the duration proposed for S-1 exceeds PCOM's original 4-day limit for supplemental science on a single leg.

Taylor commented that time is taken from legs, rather than added to them. Austin explained that the FY92 schedule had already been set when the policy on supplemental science was adopted, with the proviso that leg length would not be increased. The minutes of the Hawaii PCOM meeting imply this, though it is not stated in the motions. Taylor said that, in that case, supplemental science had to be judged against the science that it would replace.

Natland suggested that PCOM might also want to consider 2 other items: W. Sager's request to extend basement drilling on Detroit Seamount and ODP-TAMU's request for a test of the *JOIDES Resolution's* shallow-water drilling capability on Enewetak. Austin replied that the first was not an issue, since he had told Sager to discuss his plan with the co-chiefs. The second is an issue for PCOM to discuss.

Mutter asked if what would be replaced by the supplemental science was known. Austin answered that it was. The S-1 sites are located off San Diego. SGPP endorsed the science, but wanted it to come out of (hard-rock) Leg 147. However, it is more probable that Leg 146 (CA) would be impacted (Appendix 12). S-1 would have to be drilled *en route* to San Diego at the end of Leg 146. Francis pointed out that the sites were in Mexican waters (Appendix 12) and that *JOIDES Resolution* would have to put in to San Diego to pick up Mexican scientists. Austin said that S-1 would take at least 1 high-priority site from CA.

Von Rad reported that SGPP had not been very excited by S-1. It would require more like 0.25 - 0.5 leg to do properly. SGPP is very interested in CA and will not want to give up any sites. Swart added that the S-1 sites would involve drilling and coring in sand, for which the technology was not available. Austin commented that the lack of fluid sampling technology meant that the same could be said of CA.

Lancelot said that S-1 fails to involve a different community and that the science is poorly defined. Swart recalled that the S-1 was originally submitted as a low-rated, full-leg proposal. However, Taylor felt that the deep-sea fan community had been disenfranchised by ODP and that they could gain by this small effort. Austin stated that the site survey data for S-1 are poor and that other fans have better data sets. Von Rad believed that a 2-4 day program would not do justice to the problem. It needed more time. Austin informed PCOM that, whatever the outcome of the discussion, PCOM must justify itself. He would request write-ups for motions.

Lancelot did not think that the deep-sea fan community had been disenfranchised, except by their own doing. They had been very strong within DSDP. He did not believe that S-1 was what PCOM had had in mind. Austin noted that S-1 must also be judged against what would be lost. It would be up to the co-chiefs to choose which site(s) to drop. Mutter remarked that it was difficult to make a choice without knowing which site will be dropped. Taylor felt that S-1 was not popular with PCOM and suggested calling a motion to drop it. However, Austin said that he would rather discuss the other two S-proposals and then consider such a choice.

S-2: LOGGING HOLE 801C

Austin drew PCOM's attention to thematic panel comments on S-2 (Agenda Book, blue pages 15-17) and related correspondence from Winterer (Leg 143, A&G co-chief: Agenda Book, white pages 191-192) and Larson (S-2 proponent, correspondence handed out at meeting). Austin explained that Winterer wrote to express his feelings about S-2 and then Larson felt that he deserved equal time. S-2 logging operations would take ~3 days when *JOIDES Resolution* is *en route* from the Marshall Islands to MIT Guyot (Appendix 12). The likely loss would be some level of basement penetration at some site, to be determined by the co-chiefs.

In response to a question from Watkins, Francis said that the ODP-TAMU proposal to test shallow-water drilling capabilities at Enewetak could take place on either Leg 143 or Leg 144. Austin added that, in addition to its engineering benefit, the co-chiefs are interested in the proposed Enewetak shallow-water drilling, in contrast to their feelings about S-2. Duncan commented that the decision of what science to drop should not necessarily be left up to the co-chiefs, who might not represent all objectives. It might be necessary to go to the panels. Austin agreed and Duncan continued that, if a thematic panel supports an S-proposal, it should nominate part of the relevant leg, within its area of interest, that they would be prepared to eliminate. Austin pointed out that the S-proposals were reviewed by the panels, who knew that there would be losses to legs. Natland reported that Winterer felt that the time would be taken from operations at Seiko.

Lancelot announced that he was not a proponent and that S-2 had originally been part of a full proposal which had not been highly ranked. Watkins felt that S-2 sent a "good old boy" message and does not involve a new community. However, Austin thought that it was unfair to exclude people who have been involved in ODP: the *Eos* advertisement detailing supplemental science did not stipulate that. Natland believed that there was a need for logging of old crust in the Pacific, but that the holes should be deeper than Hole 801C.

Cita-Sironi favored S-2, characterizing it as short and ready to go. She added that A&G got 2 legs and can afford to lose 3 days. However, Taylor noted that 3 days was 8% of the on-site time on either leg. Furthermore, most of the holes are paired: if one is removed, 2 are effectively lost. Jenkyns said that the more discussion he heard, the more he worried about the whole scheme unless the co-chiefs really go along. Cowan stated that scientific merit is the main criterion and suggested throwing the question back to the DPG. Austin pointed out that the DPG no longer exists, but Cowan felt that communication by fax would be sufficient to enable them to define a decent leg. However, he added that he was not sure that either S-1 or S-2 was the best S-proposal.

Natland commented that it might be possible to accommodate S-2 depending on the progress of the A&G leg. He suggested making it an alternate. Austin noted that the Hole 801C logging must, however, be done before the end of the leg. Natland said that it would only be possible if the leg got well ahead of schedule. Tamaki agreed with Natland. However, Francis thought that recovery problems associated with A&G drilling would cause S-2 to fall by the wayside if it was left as an alternate. Austin felt that PCOM should not pass the decision back to the co-chiefs.

S-3: OSN-2 Cased Re-entry Hole

Austin declared that S-3 does involve a different community (Agenda Book, blue pages 17-19). The location for the proposed OSN-2 hole is right next to NW-1A, to be drilled on Leg 145 (Appendix 12). However, Austin noted that proposed, enhanced basement drilling (W. Sager proposal to co-chiefs) would probably occur early in Leg 145. Austin also drew PCOM's attention to OHP's comments about S-3 (Agenda Book, blue page 18): that the proposal was of "no OHP interest", that OHP would be "very concerned" to see time taken from an OHP leg for this project (essentially outside ODP), and that S-3 would reduce further the already small number of drilling days on Leg 145.

Duncan stated that LITHP should decide between basement drilling objectives and OSN-2. Lancelot felt that PCOM should decide on this issue, since S-3 is outside ODP's thematic framework. Austin, however, observed that LITHP and TECP had been very supportive of S-3 and that S. Humphris (LITHP chair) had told him that S-3 was more important than basement penetration scheduled for Leg 145.

Francis said that, all going well, all that could be accomplished in 4 days would be to drill 315 m of sediment and case the hole. There would be no time to penetrate basement further. Natland pointed out that there is a re-entry cone on Suiko Seamount, but Lancelot responded that FDSN wishes to place their seismometers in oceanic crust and not on a seamount. However, Taylor said that some are on islands and that Suiko fills a gap in the global seismometer network. Von Rad asked whether 10-15 m basement penetration would be enough. A sill might be encountered, for instance. Furthermore, OSN-1 has not been used yet. He questioned giving FDSN another hole. Natland responded that the crust at NW-1A was almost certainly normal oceanic crust and that the Japanese have already tested an instrument.

Austin recalled that in discussing OSN-1, PCOM's philosophy had been to give one hole to FDSN and see what they do with it. They have not yet come through. In addition, if ODP gives them a second hole, FDSN might apply every time *JOIDES Resolution* enters a gap in the global seismic network. Duncan agreed that if good results had come out of OSN-1, PCOM would support OSN-2. However, the tests have not been performed. Cowan countered that PCOM had known that results from OSN-1 would take time. Lancelot added that FDSN has learned a great deal and benefitted from the first hole. Furthermore, if OSN-2 is drilled, the French ship schedule would be altered. Austin commented that S-3 is the only S-proposal in the spirit of the original PCOM intent for supplemental science.

Mutter voiced the opinion that concerns about FDSN's technological readiness were a red herring. He drew an analogy with ODP, which is very dependent on DCS. Mutter was confident that FDSN would place the seismometers, but felt that OSN-2 should not be stuffed into an existing leg.

Natland remarked that drilling OSN-2 would provide a boost to the Japanese program. Taylor suggested having an instrument on the *JOIDES Resolution*, which could be deployed without the necessity of returning to the site. Lancelot responded that the instrument deployment can be done from a different ship. Drilling OSN-2 would help the French to get funded. Watkins noted that the proposed site is in a remote part of the world and that it would be a long time before the drill ship returned to the region. Tamaki thought that FDSN should make a global priority plan before ODP drilled another OSN hole.

Cowan asked if a "mini-leg" were feasible. Francis replied that it would increase the problems associated with leg length and also introduce an extra port call. Mutter noted that there have been short legs in the past. Austin pointed out that a mini-leg would cost ~$2M. Furthermore, it would set a precedent and more mini-leg proposals would be received. Natland observed that, if ODP must operate within the framework of ~55 day legs, mini-legs must take away time from other objectives. Austin added that, in any case, the Program Plan for FY92 has already been approved, so that a mini-leg could not now be included in the FY92 schedule. Francis expressed the belief that the goodwill of SEDCO and the support of the technical staff are very important to the success of ODP, more so than the opportunity to add the odd mini-leg.

General Discussion

Austin stated that PCOM had now looked at S-proposal science and, to some extent, at what science would have to be subtracted as a consequence. He asked whether PCOM should choose an S-proposal for drilling, adding that there was still time to involve the panels as well as the co-chiefs, in deciding what to subtract. However, PCOM must ultimately decide.

Natland favored OSN-2 (S-3) because of the level of thematic panel support of the science and the involvement of a new community (with potential for long-term commitment). The other S-proposals received less thematic panel support. Watkins agreed. However, Swart stated that SGPP had strongly supported logging Hole 801C (S-2). Swart favored S-2. It was important to log this hole in the oldest oceanic crust drilled and A&G can accommodate the time. He expressed concerns that FDSN had not yet used OSN-1 and that it was still uncertain whether emplacing a seismometer in a borehole was better than burying it. Duncan liked S-3 most, but felt that it was premature to drill a hole when it was not known whether OBSs might be as effective. Lancelot supported Natland and S-3, adding that FDSN does have a plan. OSN-1 was to test feasibility and design of the coupling between instrument and rock. OSN-2 gives an opportunity to the Japanese or French to deploy an instrument in a scientifically rewarding area. Austin suggested that PCOM could request a prioritized plan from FDSN, even if OSN-2 is scheduled.

Crawford said that 3 panels had high interest in S-2. He preferred S-2, but it was hard to balance against the science to be subtracted. Austin responded that PCOM cannot go further in characterizing the science to be subtracted without going back to the panels. Natland commented that the thematic panel support for S-2 was equivocal. Hole 801C should be deepened before further logging will be worthwhile. Von Rad noted that S-3 would occupy 10% of the drilling days of NPT (Leg 145). S-3 should not, therefore, be drilled.

Curry suggested that shifting Leg 145 basement objectives to OSN-2 might provide enough time for OSN-2 to be drilled without impacting OHP objectives. Mutter agreed, adding that his personal ranking of the S-proposals would be: S-3, S-2, S-1.

Austin commented that he was sensing that S-1 was out of the running. There was general agreement on this point. It was felt not to be strong scientifically. Lancelot recalled that PCOM had been prepared to allocate up to 10 days of supplemental science in FY92. Failure to allocate 4 days would send a bad signal. Austin agreed, noting that, at the Hawaii meeting when supplemental science was first discussed, Tucholke had stressed that if PCOM raised the possibility of supplemental science, some days would have to be scheduled. However, Austin added, supplemental science need not be done forever. Mutter felt that if PCOM were to discontinue supplemental science it would be showing that PCOM cannot run ODP. Austin disagreed: supplemental science was an experiment. The JOIDES Office might still receive 50 S-proposals next year. Blum pointed out that some S-proposals had already been received for Atlantic drilling and that he had had to inform proponents that they had submitted them too early. Austin noted that PCOM had said that S-proposals need not be consistent with leg themes and that this affects staffing. Francis explained that this was not a problem with S-3, since OSN-2 was essentially an engineering effort. Mutter added that that was also the case for S-2.

Francis raised the issue of who would draw the line at the end of supplemental science on a particular leg, whether it had been successful or not. He asked whether OSN-2 would be left before it was complete, or whether it would be completed even if it took 5 or 6 days. Duncan asked how deep into basement OSN-2 would have to penetrate. Natland responded that that was a complex issue. OSN-2 would not be a duplicate of OSN-1. Austin commented that PCOM could request that FDSN do some tests on OSN-1 and provide drilling depths, together with a global prioritization of OSN sites.

In response to a question from Watkins, Francis said that OSN-2 would probably take 4-6 days. NW-1A will already have been cored, so that only drilling and casing will be necessary (i.e., no coring). This would include 10-15 m of basement penetration. Natland remarked that it was not easy, but was fairly routine. Austin stressed that PCOM would have to allow time for the work to be done properly and that it could take 50% longer than Francis' estimate. Mutter said that the same thing can be said of any hole within a leg: all can take twice as long as scheduled.

In reply to a question from Taylor, Francis said that his estimate of 4-6 days did not include leaving any open hole. All would be cased, including the 15 m basement penetration. There would be insufficient time to drill open hole beyond the cased section. Taylor read from the S-3 proposal, which specified drilling the sedimentary section and 10 to 15 m into basement. It was not clear about the necessity for open hole in basement. He suggested inviting Purdy back into the room to ask him. Austin agreed, but cautioned that PCOM must be careful in questioning Purdy in order not to afford him the opportunity to unduly influence the future of S-3. He added that there is more uncertainty concerning S-3 than S-2: S-3 could take 20% of the on-site days of Leg 145 (Appendix 12). In reply to a further question from Taylor, Francis said that to drill ahead beyond the casing, into basement, the drill pipe would first have to be tripped, taking 18-24 hrs (in 5000 m water depth).

Mutter suggested assuming that S-3 would occupy 6 days and that the original 4-day estimate was wrong. Lancelot asked whether the load could be distributed among other legs, but Austin responded that that would make Leg 145 longer by 6 days. Furthermore, it would irritate a lot of people a little, rather than fewer people a lot.

Purdy returned and was asked by Austin whether the seismometer would need an open hole, or whether it could be emplaced in a cased hole. Purdy replied that an open hole was preferred. Francis commented that that would require a pipe trip, drilling ahead and cementing at the bottom of the hole. Taylor reminded Purdy that the S-3 time estimates were based on a completely cased hole. Purdy reiterated that FDSN would prefer an open hole, rather than a casing of unknown coupling. Purdy again left the room.

Austin stated that at least an extra 24 hrs would be required, and possibly even more time, to ensure a good section (suitable for seismometer emplacement). Golovchenko added that the BHTV would also have to be run. Replying to a question from Austin, Francis said that OSN-1 had taken 12-14 days. Austin said that PCOM was potentially faced with the same situation at OSN-2. Lancelot suggested asking the ODP-TAMU engineers whether it could be done in 10 days. However, Natland felt that the Leg 145 science would be too severely impacted if S-3 took 10 days, and Leg 145 would become too long if the load was distributed to other legs. Austin highlighted the problem of long transits and fewer on-site days in the FY92 program in the Pacific.

Taylor felt that S-3 had appeared to be an opportunity, but was now looking less attractive. He added that Dziewonski (S-3 proponent) had not asked the right questions about leg length. Duncan said he would have supported OSN-2 if experiments had taken place in OSN-1. However, Pyle noted that OSN-2 has been said to be of higher priority. Mutter stressed that LITHP had assumed that S-3 would take only 4 days when evaluating it. Austin agreed that "the bet is off" if OSN-2 takes 10 days. At Hawaii, PCOM had said that no S-proposal should occupy >4 days of ship time. Cita-Sironi also agreed that PCOM cannot stick to the 4-day requirement and also stick to S-3.

Cowan recalled that NPT had not been a highly-ranked program: OHP had ranked it first, but SGPP had ranked it seventh and TECP sixth. Austin added that Leg 145 was the least-planned leg of FY92 and that this was an advantage of scheduling an S-proposal in Leg 145. A&G and CA planning is much more advanced. Leg 145 is still being planned and the co-chiefs have just been named. The spirit of the understanding on supplemental science was to limit it to 4 days/leg, but that was not in a motion. He posed the question of whether OSN-2 science was justified. Mutter said that it was. Austin said that PCOM could decide that S-3 was the best S-proposal scientifically and make a motion to that effect. In that case, the other S-proposals would no longer be in the running, since PCOM is limited to 10 days of supplemental science.

However, Swart pointed out that if PCOM says that the science at S-3 is the best, then S-2's science must be very bad, since there is no science in S-3. Austin said that was a fair comment. Crawford noted that S-3's science might be potentially good, but that there was no point in considering it if it cannot be fitted into a leg. Austin stated that reliance on technology development is part of ODP. Cita-Sironi suggested that Francis be asked to present the ODP-TAMU ideas on shallow-water drilling, but Austin preferred to defer that issue.

A series of straw votes were held which revealed that PCOM ranked S-3 highest among the S-proposals. Austin noted that a rationale would be needed for why S-1 and S-2 were ranked lower than S-3 and that he will ask PCOM to write it. In response to a question from Von Rad about the procedure of dropping S-1 and S-2, Austin said that it was an attempt to whittle down the discussion. However, Mutter observed that there was sufficient support for S-2 that he did not feel comfortable dropping it. He suggested that it be kept available as truly opportunistic in the event that something goes very wrong with A&G. Austin replied that PCOM can suggest that S-2 be an alternate when it discusses near-term planning. PCOM passed the following motion.

PCOM Motion

Upon evaluation of the three supplemental science proposals we have received, PCOM ranks the potential science return of S-3 (OSN-2) the highest. Therefore, PCOM will consider only S-3 for scheduling in FY92.

Motion Natland, second Lancelot — Vote: for 11; against 1; abstain 4; absent 1

Austin asked whether, now that PCOM was only considering OSN-2, it should schedule S-3. In response to a question from Watkins, Austin said that W. Sager had presented a letter proposing enhanced basement objectives at Detroit Seamount. Austin had advised Sager that his proposal should be incorporated into the planning process being conducted by OHP and the Leg 146 co-chiefs. Pyle asked how Sager's proposal differed from supplemental science; Austin answered that it was not supplemental, but was integral to the leg. Natland added that a paleolatitude study was in the original prospectus and that Sager is simply suggesting doing it properly. He will help plan Leg 145 with OHP. Blum explained that Sager was informed of the options for getting his ideas incorporated and decided not to submit them as a supplemental science proposal. Natland acknowledged that Sager's proposal will probably be impacted if OSN-2 is drilled. Responding to a question from Taylor, Austin said that one Leg 145 co-chief will be at OHP's next meeting.

Tamaki noted that OSN-2 is far from Japan, but that it should be visited at least once/year. He would, therefore, prefer OSN-2 to be drilled further south, perhaps during Leg 144. FDSN did not need to insist on the NW-1A site. However, Natland stressed that FDSN had specified a site and that PCOM could not change that. Taylor added that it is adjacent to an existing site. Austin explained that OSN-1 had to be cored and logged, but that this will have been already done at OSN-2. If the OSN-2 site was moved, an extra hole would have to be cored. Taylor remarked that 5 of OSN-1's 12 days are already scheduled on Leg 145 (i.e., coring and logging at NW-1A). OSN-2 should, therefore, only take 7 days. Tamaki reiterated his position. Taylor responded that the Leg 144 holes are not suitable for OSN and that a new hole would have to be drilled and cored. Austin said that the philosophical necessity of coring and logging all ODP holes means that OSN-2 will take much longer if it is moved.

Cowan suggested a motion allowing a maximum of 10 days of drilling on Leg 145 for OSN-2. He said that he deliberately did not refer to S-3, since OSN-2 will require additional basement penetration not described in S-3. Austin pointed out that it must also be specified that OSN-2 be paired with NW-1A. Mutter objected that Leg 145 would be impacted by 10 days. Austin added that this was 25% of the on-site time. Duncan emphasized that PCOM must know what science would be replaced. Austin said that PCOM could turn the issue back to the thematic panels for review and recommendations of what to cut. OHP's response can be predicted, but the responses of LITHP and TECP are important. Cowan recalled that Shackleton (OHP chair) had said, at the Hawaii PCOM meeting, that OHP was only interested in the Neogene. Austin noted that how the time is to be taken would have to be in any PCOM motion: if the time is to be distributed among more than 1 leg, Leg 145 will grow in length, while other legs will be shortened. Francis reemphasized that SEDCO and the ODP-TAMU technicians want shorter legs.

Duncan observed that if all basement objectives were removed from Leg 145, it would free 7 days (Appendix 12). However, PCOM would need to hear from LITHP and TECP that this was an acceptable exchange. Tamaki said that the most important point is to demonstrate that borehole seismometers are better than those on land. OSN-2 might be redundant if onland seismometers were deployed in the Kuriles and Aleutians. Taylor countered that such locations were not on the most desirable side of the trench. Tamaki added that maintenance would also be a problem at OSN-2. Austin responded that FDSN will never get service if they do not establish sites. ODP is in a position to provide assistance to another major international initiative to help it get off the ground. Natland remarked that Purdy had said that OSN-2 would be an important site even if land stations were available. Taylor noted that F. Duennebier (University of Hawaii) has not been able to get funding to service his high-frequency downhole seismometers, adding that OSN-2 is a remote site. However, Lancelot felt the analogy to be invalid, since FDSN was a large community. Austin stated that if ODP does nothing for FDSN, they will get nothing from other sources. Taylor questioned whether the first seismometers should be put in such remote places. Austin noted that FDSN had not chosen to place an OSN site on the CA (Leg 146) schedule. Taylor responded that the reason had been the lack of a duplicate site on that leg.

Austin felt that the case still might not be strong enough for PCOM to schedule OSN-2. PCOM could ask FDSN to provide a prioritized list of OSN sites for the PCOM Annual Meeting, and also go back to the panels for further advice. Natland raised the possibility of moving NW-1A. Duncan responded that OHP had chosen NW-1A based on the available data; Austin added that moving the site would not bring it closer to port. Jenkyns said he would prefer to defer the issue to the Annual Meeting, when panel chairs would be present. Austin stated that PCOM had made a selection: PCOM can now ask S-3 proponents to prioritize OSN sites globally and also request additional thematic panel input before making a final decision. Francis pointed out that, by deferring, PCOM was reducing the number of legs from which time could be taken, and also sending a message that only those S-proposals to be scheduled near the end of the FY have a chance if the decision is left to the Annual Meeting.

Austin, referring to the Agenda Book (blue pages 19-20), said that PCOM must decide whether it wishes to continue with the supplemental science experiment. Taylor disliked the "subtraction" concept. He felt that the issue of supplemental science must be dealt with early in the planning process, not after legs have been scheduled and when science must be subtracted. Some Atlantic S-proposals were already in the system. They could be made truly supplemental. Austin felt that S-proposals did not fit into advanced planning: they are small projects, generally unrelated to the legs to which they may be attached. Mutter asked how OSN-1 got onto the schedule. Austin replied that PCOM had been very sensitive to renewal and the impact of liaison groups. Mutter responded that it was, therefore, possible to schedule mini-legs. However, Natland pointed out that OSN-1 got onto the schedule before the Hawaii 1990 Annual Meeting, when Francis had stressed the importance of a 56-day limit to leg lengths. Austin reiterated that uneven leg lengths create problems; Francis added that every leg has more objectives than it can accommodate: co-chiefs have to make choices.

Mutter acknowledged that the proponents of S-3 should be told that PCOM likes the proposal and would like to schedule it, but that PCOM needs more information from proponents and panels. Taylor again expressed his belief that S-proposals should be incorporated early in the leg planning process. He suggested allowing submission of short proposals. Austin said that that was not supplemental science, but it would force panels to assemble legs from proposals of varying length. Supplemental science presupposes a ship track, not just a 4-year plan. Taylor said that, in that case, legs should be scheduled to last <56 days, so that supplemental science can be added. Austin asked Francis how short legs can be. Francis replied that short legs add to costs and worsen the ratio of transit time to drilling time. Natland agreed that small projects should be incorporated when a leg is planned. Austin noted that such a strategy would affect staffing.

Natland said that Leg 145 was a pieced-together leg. He thought that it would be possible to come up with 10 days out of the program. Austin said that PCOM can tell OHP to incorporate OSN-2 if it is important. However, 10 days is a lot more than 4. If S-3 had originally specified 10 days, OHP would have been more negative and LITHP and TECP might have been less favorable. Lancelot stated that S-3 did not fit within the thematic approach, so PCOM must evaluate it, not the panels. PCOM should not let OSN-2 be killed by panels with other interests. Mutter again suggested a mini-leg, but Francis replied that 2 back-to-back mini-legs would be required, or there would be no crew change and one extra-long leg for the SEDCO and ODP-TAMU staff.

Austin said that he was prepared to send S-3 back for review and also to declare supplemental science a bad experiment. Cowan read a preliminary consensus on asking the thematic panels and Leg 145 co-chiefs for further input. Curry asked whether it removed the option of shortening other legs. Austin replied that he believed that it did, but that the decision had not yet been made. Natland stressed the need to find out what was needed at a minimum to make Leg 145 a success. Austin said that it would be important for PCOM liaisons to thematic panels to stress the need to know how Leg 145 would be impacted first, without shedding the load to other legs. Responding to a question from Cita-Sironi, Austin stated that S-3 proponents would have to consult with Francis to determine refined time estimates. Natland suggested a straw vote on the idea of taking 10 days from Leg 145. Cita-Sironi reiterated that that contradicts the 4-day limit. Austin countered that that limit had been a consensus, not a motion.

Austin asked to hear from those opposed to S-3. Curry felt that 10 days was an extreme impact on Leg 145 and that it was bound to impact OHP objectives, not just those of LITHP and TECP. He added that he would be in favor of S-3 if it took only 4 days. Swart agreed and felt that the preliminary consensus read as though PCOM had already decided. Austin agreed that a modification to the consensus was in order: the objective is to ask the panels and co-chiefs about the 10-day limit. Mutter commented that PCOM already knows that OHP's answer will be strongly negative. Austin responded that PCOM is asking LITHP if it will give up basement objectives for S-3. It is possible that OSN-2 can be completed using only time from LITHP objectives. Lancelot said that he hoped that OHP would respond with something more constructive than "no way", and that it will evaluate its objectives: NPT is still weak. Austin reiterated that LITHP was the key. He felt that LITHP was more interested in OSN-2 than in basement objectives. Swart noted that if all of the time was taken from basement objectives, the flexibility to drill extra sites would be removed. Taylor remarked that the basement objectives could be alternates. Austin reminded PCOM that it had not yet scheduled S-3. Natland felt that if S-3 strangled OHP's objectives, then it should be dropped. However, by dropping basement objectives and weaker science, there should be time for OSN-2. PCOM finally reached the following consensus.

PCOM Consensus

In order to decide at the Annual Meeting whether to reserve a maximum of 10 days during Leg 145 for drilling a re-entry hole, OSN-2, paired with NW-1A (Supplemental Science Proposal S-3), PCOM asks the thematic panels and co-chiefs for Leg 145 to determine which sites would be modified or dropped to accommodate up to 10 days at OSN-2.

Austin emphasized that PCOM would have to take a stand on the continuation of supplemental science. The concept had been introduced to try to involve other earth sciences groups, but this did not seem to be happening. In response to a question from Malfait, Blum reported that 3 Atlantic S-proposals had been received to date.

Natland suggested encouraging submission of short proposals, based on the 4-year plan, that could be incorporated into legs at the planning stage. Cowan agreed with Natland, adding that he would hate to see FDSN lose all opportunity to get holes drilled. Austin pointed out that short proposals could not be received early in the planning process and still have a cut-off date. OSN-2 could not have been submitted until the ship track had been established. Lancelot suggested simply stating that proposals need not be for whole legs, though he acknowledged that this would not be supplemental science as PCOM had originally wanted it. PCOM should advertise that a single site can be proposed. Austin noted that new proposal guidelines had just been published, but that panels will rank short proposals with little supporting data poorly.

Cita-Sironi suggested continuing the supplemental science experiment for one more year. The time required for S-3 is longer than was originally presented and it affects a planned leg, but supplemental science should not be written-off altogether. Cita-Sironi expressed support again for S-2. Blum agreed that a 1-year experiment with supplemental science was not enough. Austin reminded PCOM that the supplemental science concept originated at the last Annual Meeting. He could have it discussed at the PANCHM meeting preceding the next PCOM Annual Meeting. PANCHM may characterize it as a mistake; it also makes more work for panels. They would have to incorporate short proposals into legs. Mutter stressed the importance of developing a mechanism other than trying to stuff supplemental science into already-scheduled programs. Austin acknowledged that panels should have been asked to evaluate what science could be dropped when they evaluated S-proposals. He added that PCOM could say it was discontinuing S-proposals, but that it still encouraged the submission of short proposals. Blum commented that this is not supplemental science.

In conclusion, Austin noted that PCOM is unhappy with the concept of supplemental science; the minutes will reflect that. PCOM also passed the following motion.

PCOM Motion

PCOM moves to discontinue the practice of accepting "Supplemental Science" Proposals (as defined by its motion and consensus of December 1990). However, continued submission of proposals requesting less than 1 leg of drilling is encouraged. Such proposals will be ranked in accordance with normal ODP review procedures.

Motion Taylor, second Natland — Vote: for 13; against 1; abstain 0; absent 3

915. OPCOM

Austin recalled that, at its April meeting, PCOM heard of the availability of an extra $2.1M for the purpose of furthering the objectives of the LRP. At that time, PCOM decided to set up the Opportunity Committee (OPCOM) to discuss ways of using the extra funds, and wrote the OPCOM mandate. OPCOM met at JOI, Inc. on June 7. Minutes are included in the Agenda Book (white pages 173-185).

OPCOM decided to consider the funding increment as a step function for FY92 and FY93. It concluded that the DCS was the most important project to be funded during this period, and that DCS testing should be carried out aboard *JOIDES Resolution*, the platform on which it will be deployed. $1.9M was allocated to the DCS (spread over the 2 years FY92 and FY93). OPCOM discussed whether this was too much for ODP-TAMU to use effectively and decided that it was not. OPCOM's second priority was logging and fluid sampling and its third was alternate platforms. OPCOM recognized the need for a feasibility study on alternate platforms; Austin has contacted a consultant, H. Zaremba. He is willing to carry out the study, even though funds will not be available before October 1 ($100,000 has been allocated). Zaremba will be at TEDCOM's fall meeting and estimates that the study will take 6 months. OPCOM decided that the best use of alternate platforms would be in association with existing programs (e.g., A&G and New Jersey sea level). Finally, OPCOM acknowledged that its decisions have staffing implications for ODP-TAMU. PCOM must now decide on these recommendations.

Discussion

Natland pointed out that deep drilling had been in OPCOM's original mandate, but was not apparently considered by OPCOM. This is also in the LRP and PCOM should look at this now. Austin responded that the DCS is tied to deep drilling. Natland noted that the thematic panels had been asked to prepare targets for deep drilling. Alternate platforms might be required if the targets are beyond the capabilities of *JOIDES Resolution*. ODP-TAMU should hire an engineer to consider the panels' deep drilling targets. Austin replied that TEDCOM will consider the issue and Zaremba will be there for alternate platform advice. More information is required on alternate platforms: there is not enough to go on, at present, to justify hiring an engineer. Natland recalled that TEDCOM had recommended having someone study deep drilling at ODP-TAMU. Austin stated that Zaremba will get continued exposure and information from the ODP system. Austin's total contact with Zaremba has only been 2 phone calls and a letter to date. It was necessary first to find out whether he was interested. PCOM can give him input and he will do what is requested. Furthermore, he will not have a mandate if PCOM does not approve of him. Natland reiterated that he would like to see more action on deep drilling. He felt that PCOM should commit to some sort of study of deep drilling, or it will be admitting that it will not be addressing a LRP objective in the stated timeframe.

Taylor pointed out that the first step in deep drilling (as stated in the OPCOM mandate, Agenda Book, white page 51) is to maximize the capabilities of the *JOIDES Resolution*. ODP has not yet even drilled to 2000 mbsf. Austin stated that maximizing those capabilities is an issue of "community will"; PCOM will have an opportunity to discuss it in December in connection with the FY93 Program Plan. *JOIDES Resolution* has a dynamic 7.3 km string length. Therefore, a 2.5 km hole in 4 km of water is feasible if the ship is left on site long enough, and that is a PCOM decision. Mutter asked about the timeframe of Zaremba's study. Austin replied that PCOM has to set his mandate. All that has been done so far is to contact him. Responding to a further question from Mutter, Austin said that PCOM will have to consider deep drilling issues in December in conjunction with the decision of whether to schedule legs from NARM-DPG. Maximizing the capabilities of *JOIDES Resolution* involves decision making, not engineering. The community has displayed no will to allow the drill ship to sit on one spot for extended periods. Cita-Sironi asked how long it would take to drill a 2 km hole. Austin replied that NARM-DPG estimated 48 days to drill 2.5 km, including logging. Taylor noted that Site 793 (~1700 mbsf) took ~0.5 leg, though he believed that Nankai involved the longest continuous occupation of a single site.

Returning to the question of Zaremba's study, Austin was unsure as to whether he can extrapolate beyond existing technology. A different person might be required for the longer-term future. Lancelot stated that TEDCOM agreed that deep crustal drilling is an unknown and that ODP must think in different terms. Francis added that there are different types of deep drilling. Crustal drilling to 6 km (Moho) is currently impractical. Drilling to 2.5 km (as recommended by NARM-DPG) is achievable now and ODP-TAMU has the necessary personnel. Austin stated that it was still an open question as to whether ODP should get involved in such drilling. Natland asked what PCOM's course should be. Taylor reiterated that Natland had noted that deep drilling was not specifically covered by OPCOM's recommendations. Watkins responded that deep drilling was subsumed under DCS.

Austin asked whether there was any disagreement with OPCOM's first priority: DCS. Swart asked whether there were any checks to prevent DCS becoming a "bottomless pit". Mutter commented that the objective is to accelerate development of DCS, not throw money at it. Austin reported that a hearing on DCS would be held in October. Mutter noted that DCS is not equivalent to deep drilling: other routes to deep drilling might have to be followed. Austin remarked that Natland's proposed modification to the OPCOM recommendations to include hiring an engineer arose in part because TEDCOM did not want to do the job. However, Francis felt that to be unfair to TEDCOM, who do provide outside information. Austin observed that SGPP had not provided information on deep sites for TEDCOM: both LITHP and TECP have provided such information.

Austin asked about OPCOM's second recommendation on logging and fluid sampling. Golovchenko noted that the high-temperature resistivity tool was to be developed by Camborne School of Mines and that a meeting was scheduled in Houston, immediately following the August PCOM meeting, to discuss downhole fluid sampling. Von Rad asked whether that meeting would include discussion of GEOPROPS. Francis answered that it would. Pyle reported that discussions had taken place with the US Department of Energy, who will provide money for a high-temperature sampler for borehole fluids (as opposed to formation fluids). In response to a question form Cowan, Austin said that the wireline packer had cost ~$200,000. Lancelot asked whether it had been OPCOM's philosophy to try to put money where the need will be most urgent in FY92 and FY93. Austin replied that recommendations 2-5 had not been prioritized: only recommendation 1 (DCS) was prioritized.

Regarding recommendation 3 (alternate platform feasibility studies), Austin reported that alternate platforms were considered for DCS testing. OPCOM's feeling, however, had been that DCS should be tested on *JOIDES Resolution*. Austin had made the recommendation at OPCOM that it would be best to consider alternate platforms in the context of existing highly-ranked programs.

Natland asked if there was any real chance of getting an alternate platform for A&G in FY92. Mutter remarked that alternate platforms would lack *JOIDES Resolution's* labs. Austin responded that that was the point of using an alternate platform when *JOIDES Resolution* is in the vicinity. Lancelot commented that R. Ginsburg had used a platform without laboratory facilities in the Bahamas. Mutter stated that what was being discussed was an additional platform, rather than an alternate platform.

Von Rad felt that extended discussion of the OPCOM recommendations was unnecessary, characterizing them as good recommendations for the near-term future. Austin acknowledged that OPCOM might have slighted long-term deep drilling. However, the question was whether PCOM should start long-term planning now or not.

Natland read the following addition to the OPCOM recommendations, which could be added to the OPCOM recommendations as a new item 4 (displacing the original item 4 to item 5 and the original item 5 to item 6):

4) Recognizing the long-standing commitment of the scientific community to develop the means of drilling holes 4-6 km deep in 2-5 km of water, PCOM recommends that JOI, Inc. use the most effective route to commission a feasibility study to accomplish such drilling, based on target specifications now being prepared by the several thematic panels. PCOM anticipates a funding level of $0.1M in each of FY92 and FY93 for this item.

Austin said that this was not a motion, but a modification to an existing set of recommendations. There only needs to be discussion of this, since OPCOM was an internal subcommittee of PCOM. The recommendations will eventually go to JOI, Inc. and NSF. If PCOM is comfortable with this new recommendation, it will simply be added to the list. Mutter felt it to be a good addition. It would require $200,000 to be taken from one of the other recommendations. Austin stated that old recommendation 4 (now item 5) was the "sponge" and that the $200,000 could be taken from that (reducing the $1.7M of unencumbered FY93 funds to $1.5M). He added that Natland's modification would be included in the OPCOM recommendations.

Mutter noted that the mandate of the alternate platform study should be addressed, for recommendation 3. Austin said that he would be guided by PCOM. Zaremba perceives his job as that of augmenting the capabilities of *JOIDES Resolution* for near term programs, but that the mandate had not been defined. Mutter raised the possibility of asking Zaremba to consider the longer term. Austin said that he would be able to ask Zaremba at TEDCOM. Taylor suggested modifying the OPCOM recommendations by replacing the term"alternate" platforms with "additional" platforms. He commented that the cost of high-latitude support vessels was supposed to have been part of the regular cost of the program, but this money must have been used for other things, since funds have been earmarked from OPCOM for this purpose. Francis responded that this was because SOEs had been used for essential engineering development instead.

Austin stated that if the funding increment is a step function, it is not clear that OPCOM-type discussion will be needed for the second year. Malfait noted that the idea is not to fritter away the money on extra personnel, etc. It should be used to assist in the achievement of LRP objectives. Austin asked whether OPCOM should meet again, or whether its modified recommendations should be forwarded to JOI, Inc. Mutter suggested that, if OPCOM were to meet again, suggestions be solicited from a wider community. However, Natland felt that ODP does get such suggestions and that it would not be useful to solicit them. Austin said that timing was also a problem: he would prefer to get the money sooner, rather than later, and the "meter starts running" on October 1. Responding to another question from Mutter, Austin said that panels had had the opportunity to discuss the funding increment, by mail or at meetings, and forward their opinions to OPCOM. Pyle added that the funding increment was aimed at the LRP and that necessarily narrowed the options for its use. Austin concluded that he sensed that PCOM did not feel it necessary for OPCOM to meet again.

Pyle asked PCOM for its thoughts on whether PCOM endorsement was sufficient for the OPCOM recommendations to go to JOI, Inc. for budgeting. The endorsement should go through EXCOM, but EXCOM did not meet until January, which was late in the budgeting process. Pyle added that he would like PCOM to say that this can be dealt with by BCOM, convened by mail or fax. Cowan asked what would happen if the fluids meeting recommended spending $400,000 immediately. Austin replied that BCOM (which includes Austin) can be given the power to make limited modifications. If $1M is requested, the decision might have to come back to PCOM. PCOM passed the following motion.

PCOM Motion

PCOM endorses the plan for allocation of incremental funding recommended by OPCOM as modified by PCOM (see minutes for 21 August 1991). To make the funds available in a timely manner, PCOM recommends that the spending plan be passed to BCOM for their consideration prior to their scheduled meeting (i.e., early 1992).

Motion Mutter, second Duncan — Vote: for 16; against 0; abstain 0; absent 1

916. Adjustments of Near-Term Program

LEG 140 (HOLE 504B/HD)

Austin stated that the plan for Leg 140 was to begin at Hole 504B and move to HD if Hole 504B cannot be cleaned within 1 week to 10 days. The status of site selection at HD was included as an attachment in the Agenda Book (white pages 201-208).

Taylor pointed out that the primary site is on the intra-rift ridge (Agenda Book, white page 205). He reported that OD-WG had felt comfortable with H. Dick's proposal. Austin noted that the issue was whether submersible data was sufficient for choice of site. Good seismic data are lacking. Austin stated that he was also comfortable with H. Dick's proposal as the basis for an initial approach to HD. He added that the minutes would reflect PCOM's endorsement.

Another issue was the time to be allowed at Hole 504B. If milling is used, it could take >10 days to clean the hole. Austin asked whether PCOM wished to endorse more freedom to the co-chiefs to decide, or whether the decision should be left to Austin , Pyle, ODP-TAMU and the co-chiefs.

Lancelot responded that he was happy to have that sub-group decide, so long as it was realized that there was nothing magical about the 10-day limit. If the hole can be cleaned without milling, it might be completed within 2-3 days. After that, it might be best to go straight to milling. Austin informed PCOM that Leg 140 provided 39 days of on-site time at Hole 504B. A transit to HD would take 4.5 days and the trip from HD to Panama would take 6 days. Too long a delay before going to HD leads to a situation of diminishing returns. Francis added that if milling is begun, but does not work, little time will remain for HD. Natland commented that

H. Dick has the minimum time requirements worked out and is aware of the cut-offs. Austin reminded PCOM that there were contingencies associated with Leg 137 and these can be left in place. However, PCOM should be aware that milling is a new variable. Lancelot stressed that the decision-making group must be informed of progress early, and not just after 10 days.

LEG 141 (CTJ)

Austin stated that GEOPROPS would not now be on the drill ship for Leg 141. He asked whether the planned test of the MDCB should, therefore, still be conducted, noting that Leg 141 is short of time for its stated objectives. Austin added that the MDCB might have a lower engineering priority now that GEOPROPS is unavailable.

Lancelot asked Francis whether the ODP-TAMU engineers will wish to test the MDCB later, if not on Leg 141. Francis replied that the philosophy is that if MDCB does not work, there will be no further spending on it. However, it does need a test. Austin reminded PCOM that GEOPROPS was the primary rationale for the MDCB. Francis pointed out that the MDCB test would only take a few hours and, furthermore, that D. Huey would be on Leg 141; he has been the ODP-TAMU engineer behind MDCB. There was general agreement that the test of the MDCB on Leg 141 should take place as planned.

LEGS 143 AND 144 (A&G)

Austin reported that ODP-TAMU has approached the co-chiefs to test the shallow-water capability of *JOIDES Resolution* with a site or sites. Francis explained that the proposed test was part of the attempt to maximize the capabilities of *JOIDES Resolution*. SEDCO has tested the sister ship of *JOIDES Resolution* (472) in 57 ft (17 m) of water in the R. Tagus at Lisbon. DP was used with a taut wire. SEDCO feels that, with good sea conditions, the vessels can drill in very shallow water (<<60 m). The shallowest water in which *JOIDES Resolution* has drilled to date has been 150 m. ODP-TAMU felt that a test would be useful. This would be an engineering test, involving only rotary drilling (the APC cannot be used in shallow water). ODP-TAMU had written to the co-chiefs asking them to suggest an atoll. They were keen about the test, since it opens up prospects for atoll drilling in the future, and suggested Enewetak. The test will require about 30 hrs. on site, plus a transit time of about 2.5 days. Enewetak is a big atoll and was the site of 43 nuclear explosions between 1948 and 1958. It has been covered extensively by geophysical surveys. ODP-TAMU staff scientists on legs 143 and 144 will pick the site and it will go to PPSP in October. The water depth will be ~20 m.

Malfait asked whether the Nuclear Regulatory Commission had drilled on Enewetak. Francis answered that they had, and had studied Enewetak in great detail. Austin commented that it would be useful to tie the proposed ODP-TAMU drilling into the existing drill data, referring to a recently-published USGS Memoir by B. Wardlaw. Francis noted that the proposed Enewetak site was the only true atoll site in the legs 143 and 144 "atolls" and guyots program.

Austin asked whether Francis was certain of unanimous co-chief support for the test and asked how it would be incorporated into the legs' prospectus. Francis answered that he was sure of co-chief support; the test could take place on either Leg 143 or Leg 144. Austin noted that this was a substantial deviation from the Program Plan and would require a motion. Taylor asked how it would affect thematic panel objectives. Watkins noted that A&G-DPG had regretted that the drillship could not drill on atolls; there was unanimous enthusiasm for this sort of thing. He asked how deep a hole could be drilled in 30 hrs. Francis replied ~200 m. Swart cautioned that a great deal of sand might be encountered. Francis replied that if this test of the DP system in shallow water was successful, a return could be made with DCS in the future. PCOM passed the following motion.

PCOM Motion

PCOM endorses the concept of drilling one rotary core site in the lagoon at Enewetak Atoll for the purpose of testing the drilling capability of *JOIDES Resolution* in shallow water. The duration of this test, including deviation from the proposed (legs 143/144) track, should not exceed 60 hours.

Motion Swart, second Cita-Sironi — Vote: for 16; against 0; abstain 0; absent 1

Austin reminded PCOM of the plan to include logging of Hole 801C (S-2) as an alternate. It could impact Leg 144 (Appendix 12). Golovchenko felt that if it was left as an alternate, it would not get done. However, Austin stated that after the earlier discussion about S-proposals it could only be an alternate. Cita-Sironi said that it should not be ignored. PCOM passed the following motion.

PCOM Motion

PCOM moves that supplemental science proposal S-2 (to log Hole 801C) be incorporated in the prospectus of legs 143/144 (Atolls and Guyots) as an alternate site, and that the appointed co-chief scientists consider logging at Hole 801C, which has a considerable scientific merit as recognized by the thematic panels and by PCOM, if time is available.

Motion Cita-Sironi, second Natland — Vote: for 16; against 0; abstain 0; absent 1

LEG 145 (NPT)

Austin stated that Leg 145 had already been discussed at length and the appropriate action taken. There was no need for further discussion at this stage.

LEG 146 (CA)

Austin explained that the GEOPROPS issue had bearing on Leg 146. Furthermore, his perspective was that Leg 146 got onto the schedule primarily as a fluids program, but that limited fluid sampling capability was now available. Taylor asked if that meant that options for Leg 146 were limited to those available at Nankai. Francis replied that that was so, except in the unlikely event that GEOPROPS was ready. Taylor asked about the status of LAST. Austin replied that LAST was not ready. It was back with the manufacturer. He added that PCOM would be discussing third-party tool development later in the meeting.

Golovchenko recalled that LAST I had worked on Nankai, but Francis said that LAST II had not yet been made available. Taylor noted that K. Moran had produced a tool (LAST I) that worked. Natland asked what might be expected from CA. Cowan replied that there were 2 parts to CA. The first is the Vancouver Island diffuse porosity and hydrates study, which only needs squeezed water. The second part is the main fluids element. The only possibility will be to use a drill string packer, probably in perforated-cased holes. Francis reminded PCOM that the PCS is working. However, Cowan agreed that in the sense that CA had wanted the capability to isolate parts of the hole near faults, the situation was the same as at Nankai.

Austin said that PCOM must be realistic about what Leg 146 can accomplish, though he was not suggesting removing it from the schedule. Von Rad suggested contacting SGPP and the co-chiefs: perhaps they could push the development of GEOPROPS. Austin pointed out that development of GEOPROPS had been guided by someone who no longer feels his science is being served by further effort on GEOPROPS. In response to a question from Duncan, Cowan said that he had asked C. Moore whether Leg 146 would be worthwhile if GEOPROPS was unavailable. Moore had suggested the drill-string packer, but that will not help isolate sections of hole.

Austin stated that, though the existing third-party developer will not work further on GEOPROPS, it could be ready for Leg 146 if PCOM makes a recommendation, e.g., to turn it over to ODP-TAMU. However, he added, PCOM had made GEOPROPS and the MDCB the lowest ODP-TAMU priority in April, 1991. Duncan asked how close to completion GEOPROPS was. Francis replied that it had been tested at the end of June by TAM in Houston. It was felt to be not yet ready for sea, and will need a sea test prior to CA.

Taylor said that, as far as CA was concerned: 1) availability of GEOPROPS is a primary issue, 2) the leg should continue even without GEOPROPS, 3) the issue of how to develop GEOPROPS should be left until the agenda item on third-party tools. Austin asked whether PCOM should modify Leg 146 because GEOPROPS is not available, or tell ODP-TAMU to make GEOPROPS available. Francis noted that, even if an ODP-TAMU engineer can be found to get GEOPROPS ready, PCOM should not expect too much of the tool on Leg 146. Mutter asked what it would take to get GEOPROPS ready for Leg 146. Francis replied that it would require an engineer and ~$25,000. S. McGrath, a new ODP-TAMU engineer, might be appropriate, though he could not do much work on GEOPROPS until January, since he is going on Leg 141. Furthermore, this would mean setting aside the engineering priority list endorsed by PCOM in April. Austin noted that that priority list (Agenda Book, white page 37) does show MDCB required for GEOPROPS on Leg 146. He added that having GEOPROPS become ODP-TAMU's responsibility sets a precedent that might encourage other third parties to drop tools for ODP-TAMU to pick up. Perhaps it would be best to wait for recommendations of the fluid sampling meeting chaired by P. Worthington. Taylor asked whether this would indeed be a precedent, noting that some of K. Becker's equipment had been incorporated into ODP-TAMU. However, Austin explained that once a tool becomes deployable on the drill ship, it goes to ODP-TAMU anyway.

Cowan stated that CA needs a fluids sampler and asked what could be done to guarantee that the tool will be workable and on the drill ship in only 1 year. Austin remarked that he was concerned about admitting now that GEOPROPS will not be available. Fluid sampling is important. Cowan said that PCOM should then wait for Worthington's fluid sampling meeting to report. Natland pointed out that deployment for Leg 146 requires immediate action, but if GEOPROPS is intended as a long-term tool, designed with more than Leg 146 in mind, it should not be abandoned, even if it cannot be made ready for Leg 146. Austin commented that he did not think that deployment of GEOPROPS on Leg 146 was impossible. Francis said that MDCB and GEOPROPS would have to be tested before Leg 146. That test would have to be on Leg 144. Responding to probing from Austin, Francis admitted that it would be possible. Austin felt that such developments must be scheduled and pushed, or they would never happen. Sediment squeezing might always be the only way to sample fluids.

Duncan suggested that a co-chief replace the GEOPROPS third-party developer to interact with ODP-TAMU. Austin pointed out that the previous third-party developer had not wanted to write another proposal for funding. Natland asked what might be possible sources of $25,000 in the short term. He suggested OPCOM or USSAC funds. Pyle replied that the OPCOM funds would not be available and that USSAC is a US program, while GEOPROPS is an international tool. Austin noted that even if a co-chief could be persuaded to write a proposal for more funds, it would not solve the problem of making the engineering personnel available. Natland stated that GEOPROPS had been funded by US money all along and asked why USSAC was out of the question. Pyle replied that ODP-TAMU is an international organization. Austin wondered whether a US co-chief might be able to get money from USSAC. Pyle said that USSAC's response would be that this was an inappropriate use of US funds. Austin stated that OPCOM money has been committed for fluid sampling, but was not yet ready. Pyle added that OPCOM funds could not be available on October 1, because of the need for BCOM consideration. Swart felt uneasy about jeopardizing a leg for only $25,000 and asked whether ODP-TAMU could not put up the money. Austin said that would be a bad precedent.

In response to a question from Mutter, Pyle said that $25,000 was probably an underestimate of the cost of GEOPROPS. Something would have to be dropped. Austin reiterated that the OPCOM money would not be available until early 1992. Taylor asked whether, if that was the case, enough time remained for GEOPROPS to be developed. Swart pointed out that even if a proposal was written today, no funds could be received before January. Pyle stated that ODP was in the red and that he would not mortgage it further. Austin explained that JOI, Inc. could spend the money, but that it might not get it back. In that eventuality, PCOM would have to tell JOI, Inc. where something could be dropped. Malfait said that re-budgeting the Program Plan was an option.

Cowan suggested leaving the matter to BCOM, pending the report of the fluid sampling meeting, since it must be determined whether the investment is worthwhile. Austin reminded PCOM that, even if the money was available, an engineer and a proponent to interact with ODP-TAMU (perhaps a co-chief) would be required. Natland suggested not making CA Leg 146. Austin responded that PCOM was not in that position. The question is what to do now. Austin said that CA might have to be made the GEOPROPS test leg. Watkins agreed with Cowan. He asked what could be done, in light of the Gas Hydrates workshop, to find out more about hydrates on CA. Perhaps the emphasis could be shifted to make Leg 146 a hydrates leg. He also suggested that deployment of Corks might be useful.

Austin cautioned that the fluid sampling committee might not be specific on the issue of GEOPROPS. PCOM must reaffirm the importance of GEOPROPS and its preparedness to allocate OPCOM money as soon as it is available. Taylor suggested using $50,000 out of the current budget for the DCS in October, and Mutter suggested sending GEOPROPS on Leg 141. Francis responded that these ideas will not work. Money was not the only consideration. An engineer is needed.

Austin referred to the guidelines on the development of third-party tools, published in the February, 1991, issue of the *JOIDES Journal*. The guidelines state that tools must pass land tests and be endorsed by PCOM. If GEOPROPS were given to ODP-TAMU now, PCOM would be breaching those guidelines. Pyle pointed out that the prevailing cost estimates and engineering time are just to get to a land test. A sea test will then be required, during which problems will probably be identified and more money required. Austin countered that to drop GEOPROPS would be to abandon fluid sampling. Natland asked whether, if the bench test had worked and GEOPROPS had gone on Leg 141 and failed, there would have been no money to fix it. If such money were available, why is it unavailable now? Malfait remarked that

GEOPROPS was supposed to have been ready for Nankai; its funding had already been supplemented twice.

Lancelot asked for clarification of the issue of third-party tools. Austin responded that the endorsed guidelines for development of third-party tools have loopholes linked to the principal investigator. Lancelot asked whether PCOM could decide that a third-party tool is so important that it should be made an ODP tool. Austin responded that the objection was that GEOPROPS was not a working tool.

Jenkyns read a preliminary motion regarding GEOPROPS. Swart suggested mentioning the OPCOM money, when it becomes available, to enable testing on Leg 146. Taylor pointed out that GEOPROPS is a physical properties tool that also collects fluids. The engineering prioritization was made on the assumption that it was a third-party tool and it, therefore, was not even included in the prioritization. If PCOM wants ODP-TAMU to develop GEOPROPS, it should be slotted into the engineering prioritization. Austin responded that he would rather not change the prioritization, especially before the report of the fluid sampling meeting. Mutter asked what would happen if the co-chiefs demand a working tool, rather than a test tool. Cowan responded that he thought that the co-chiefs would say that the leg was worthwhile whether GEOPROPS is available or not. Mutter said that perhaps PCOM should overrule that philosophy. Austin felt that the fluids thrust of Leg 146 could be de-emphasized. Swart asked whether there would be a GEOPROPS expert at the fluid sampling meeting; Francis replied that D. Huey would be present. Swart said that he would also be there. PCOM passed the following motion.

<u>PCOM Motion</u>

PCOM reaffirms the critical importance of the development of GEOPROPS, or tool of comparable capability, as an integral part of scientific planning. PCOM further recommends that OPCOM funds be made available as soon as practicable to further this aim. PCOM anticipates that a suitable tool could be tested on Leg 146.

Motion Jenkyns, second Natland — Vote: for 13; against 1; abstain 2; absent 1

LEG 147 (ENGINEERING EPR/HD)

Austin proposed deferring discussion until the outcome of Leg 140 is known.

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Austin pointed out that J. Fox, InterRIDGE liaison, would be unable to attend the meeting because of the effects of Hurricane Bob on the east coast of the US. There would, therefore, be no co-chair report.

917. Old Business

FOCUSSING ODP

Austin explained that EXCOM was concerned about the potential for focussing ODP beyond the LRP. STRATCOM was a renewal-driven initiative (see executive summaries of STRATCOM I and II, Agenda Book, white pages 187-189). Austin stated that he would like PCOM to reexamine the STRATCOM recommendations and to look specifically at the issue of focussing. EXCOM feels that PCOM is the group to focus ODP if it is felt to be necessary. Austin felt that discussion of this issue would also give PCOM members an opportunity to highlight what they think is scientifically important. PCOM may conclude, as it did a year ago, that ODP is working well and that the LRP is an adequate implementation document.

Cowan saw no need to focus ODP because: 1) it was no longer necessary for renewal, and 2) it is unclear at which audience a focussed plan would be aimed. Austin recalled that the PCOM's fear last year had been that focussing would cut out some groups and not reach new ones. Austin said that 12 of the 16 themes of the LRP are now being addressed, but that EXCOM thinks that ODP is not focussed enough.

Lancelot agreed. There is a perception that ODP is an old program. Lancelot has had to defend it in competition with other programs by arguing that ODP, and the LRP, are new. Global change programs place big problems first, followed by strategy. ODP does not. The idea of a proposal-driven program sounds good to PCOM, but others do not understand it. Lancelot reported that he has heard this from several committees. ODP should define some major problems, then define strategy. Duncan agreed with Lancelot. PCOM can provide a balance between the ideas that percolate up through the system and long-term goals. However, he felt that WGs and DPGs have been successful in focussing ODP and that there was no need to go further.

Natland noted that PCOM was no longer trying to sell ODP. His concern was that ODP is facing major programs that will take much time. Some concentration of effort will be necessary. There are too many things to do and not enough time. DSDP/ODP have had a history of concentration. Ocean history was the early emphasis: there was no crustal drilling. Ocean history is also an emphasis now, but the lithosphere community now wants to embark on some major initiatives.

Cita-Sironi pointed out that she represented 12 countries who are working together, not fighting, toward renewal. Nobody wants to drop out and there is no need to focus for renewal. Speaking as a stratigrapher, she said that there are still gaps in the record, e.g., early-middle Miocene and Oligocene/Miocene boundary. More biostratigraphy and magnetostratigraphy are needed. The stratigraphy community is large.

Mutter felt that the issue of focussing arises because of comparisons with other programs, e.g., RIDGE and WOCE. They use many tools to address a single problem. In contrast, ODP champions a single tool for many problems. At the same time, a subset of the LRP objectives could be defined that includes problems that can only be solved by drilling. These could be addressed as central themes, while not ignoring others. Austin noted that STRATCOM had come up with 6 themes, reduced from 16, for which it was felt that drilling was critical. Mutter said that ODP's goals read as knowledge-gathering exercises, adding that other programs have clearer objectives.

Crawford pointed out that Canada and Australia are in similar situations. Most geologists in those countries are land-based explorationists. ODP needs their goodwill, or Canadian/Australian renewal would be jeopardized. The drilling of 90 m of massive sulfides on Leg 139 just before the Canadian port call has been particularly important and the flow of information to continental geologists must be maintained. Renewal is now fairly certain and there is no need to focus ODP further as a renewal strategy. However, perhaps ODP should focus on problems that can only be addressed by drilling, as suggested by Mutter.

Austin agreed that ODP has been tool-limited. A 5-year renewal was now reasonably sure, but ODP was entering a period when multiple tools will be considered. It might not be too early to try to get away from the tool-limited philosophy. Taylor felt that alternate platforms will require focussing on problems only they can address. He was strongly in favor of a bottom-up, proposal-driven ODP, as was his institution. Leg 138 was a classic example of a small group of scientists writing a competitive proposal and carrying through a leg. However, in 1998, with alternate platforms arriving on the scene, he might have to argue differently.

Tamaki felt that DSDP had had clear strategies and had succeeded well. It had been a top-down program and ODP has similar obligations. He preferred a top-down organization. Austin asked what the response to the LRP had been in Japan. Tamaki replied that Japan was happy with the LRP; it had been discussed by a small committee. Responding to a further question from Austin, Tamaki said that he saw PCOM as the "top" for a "top-down" ODP.

Curry said that while, in one sense, the LRP is a document oriented toward a bottom-up ODP, it also fits a long-term Neogene focus. The 2 sides are inseparable. The best proposals in each theme always rise to the top. Lancelot commented that proponents view their task as writing proposals to use the facility. They might have thematic objectives in mind, but they are not the main point. Lancelot liked the idea of having the main problems clearly in mind. ODP is viewed as the facility: *JOIDES Resolution*.

Jenkyns noted that PCOM had stated that thematic panels can write proposals, so that there is a mechanism for top-down direction. Austin asked for the British perspective. Jenkyns answered that focussing was no longer relevant to renewal and that most people are happy. Jenkyns asked to whom PCOM was responding: 1 or 2 EXCOM members, or a broader community? However, he added that the situation post-1998 would be different. Austin commented that it was a question of how forward-thinking PCOM wanted to be.

Von Rad reported that the LRP had been discussed a great deal in Germany. There was no desire to exclude groups by focussing. In general, Germany was happy with a proposal-driven ODP. However, there are exceptions. For instance, von Rad approved of NARM-DPG's identification of gaps. He also felt that OHP should have submitted the Santa Barbara Basin supplemental science proposal, which they initiated.

Francis commented that the very nature of ocean drilling is "top down". This introduces a bias, to which ODP adds by drilling lots of shallow holes. To change this, *JOIDES Resolution* must be allowed to spend more time on site. Curry noted that the funds available for research follow a similar trend, with most for the Pleistocene. He did not think that that was just because the Pleistocene was easier to recover. ODP would be wasting its time if it collected large amounts of older material if there were no US funds available to work on it.

Sharaskin, noting that ODP depends on proposals at present, said that it makes sense to encourage people to write proposals on subjects PCOM considers important. It would also be useful to integrate not only the panels' ideas, but also those of the national groups.

Austin reminded PCOM that brochures had now been prepared by Australia, Germany, UK and the US. Their emphases should be compared. Pyle responded that that had been done to some extent and that it had been fed into the LRP. Von Rad stated that a growing community in Germany was interested in the Mesozoic, which was missing from the 6 STRATCOM themes. Watkins felt that, since the LRP had only been out for 1 year, it was too soon to worry about it and that problems would become more evident later.

Natland said that the main point is how to allocate time. Many of the oceanic lithosphere community's plans are unrealistic, but even a realistic program will require the dedication of more time. That is a top-down decision. Watkins commented that all interest groups feel that they are not getting enough time. Mutter felt that the job of PCOM was to sit above that and plan. The LRP is not seen as a plan, but as a menu from which a plan can be drawn. PCOM has yet to construct a plan. Austin agreed that was PCOM's job. However, Taylor thought it would be bad to disenfranchise a large section of the community. The Ocean Margin Drilling program had done that and it was one reason why it did not develop. He did not want "little science" to be "squeezed out". Austin countered that the Ocean Margin Drilling Program did not fail to materialize because it did not cover all communities. Focussing did not mean closing out ideas. HD was a good example of a good idea that rose rapidly through the system. Taylor said that a proposal to study the K/T impact event would also be a good example: it would not be covered by any of the existing themes. Austin stressed that the whole JOIDES structure, including PCOM, must continue to remind itself that the thematic thrust is important. No more formal action may be required at this stage than to remind ourselves.

Cowan suggested that there were 2 kinds of focussing: 1) focussing the 16 LRP themes to 6, and 2) focussing on problems that can only be addressed by the drill ship. Cowan was in favor of the latter. However, he noted, ODP was still developing a lot of the technology required for these problems, e.g., DCS and fluid sampling. Austin asked whether PCOM needed to push harder on these technological developments. PCOM has expressed the desire to address certain problems and has scheduled legs under the assumption that the technology will be ready. However, it has occasionally not been ready. Then ODP faces criticism that results would have been better if legs had been done properly. Cowan said that, therefore, PCOM should direct ODP's resources to those specific items, as OPCOM did.

Austin asked whether it was enough for PCOM to be internally cognizant of this, or whether it was important for PCOM to be more outwardly directive. He stressed that ODP was still in competition with other initiatives. Taylor asked whether ODP should focus on the things it can do well with the drill ship, or keep butting its head against things it cannot do. Mutter stated that, as Cowan had said, drilling could have a role in fluid sampling. ODP cannot do it now, but should work toward it, since drilling was the only way. However, Taylor asked whether PCOM should be scheduling legs that require this non-existent technology. Austin responded that PCOM had had this discussion regarding DCS. The decision had been to put the spotlight on DCS and test it in an area of scientific interest (EPR). Duncan felt that it would be a mistake to concentrate on things only the drill ship can do. Integration of other problems (e.g., FDSN) was also important. However, Mutter commented that if FDSN wants seismometers in holes, the only way to do that is by drilling.

Natland recalled that in 1977, PCOM had decided that, because of many legs to drill oceanic crust and accretionary margins, there would be a change of emphasis to ocean history. It was a top-down decision to exploit the HPC, a new tool. Curry agreed that it had been a top-down decision, but added that it was also a revolutionary time for paleoceanographers, who could now penetrate below the top few m. Proposals came in to use the new tool. Taylor added that if ODP demonstrates that it can do something, there will be a drive to do more of it. Tamaki stated that the bottom-up philosophy had not produced any outstanding results for the Japanese community over the last 20 years.

Austin said that it might be useful to determine which of the LRP's 16 themes are uniquely attached to drilling. He asked whether PCOM was comfortable with the way it handles input. He added that focussing is more of a US issue at EXCOM than an international one. Taylor responded that PCOM members "vote with their feet" when scheduling legs and budgeting for engineering developments. Mutter countered that that was not planning, or at least not long-term planning. It's reacting. Taylor responded that the introduction of engineering legs was a long-range development.

Austin asked whether PCOM had a perception of how panel input and ranking will lead to generation of the FY93 schedule. Natland replied that the present approach was consensus-based. He asked whether PCOM could move from that. Cowan did not think that a change would be possible while ODP was still in the DSDP mode of 2-month legs. Until the DCS is operational and a new battery of tools (e.g., fluid samplers) is available, PCOM will not be able to focus on what ODP can do well. Lancelot agreed with Natland. In the early days, panels laid out major problems and then suggested where the drill ship should go to solve them. Then they fought at PCOM for ship time. OHP still does that, but the others do not: their objectives come from PCOM. In most cases, PCOM selects the best science, but it would be nice to have a program focussed on what ODP can do uniquely. Austin reminded PCOM that it should look at the LRP and determine where ODP can make the greatest contributions. Lancelot agreed.

Taylor felt that PCOM needed input. Panels should consider the LRP points in detail and pull out what they think should be done globally about specific problems. Austin pointed out that panel white papers exist; they are viewed by panels equally with the LRP. Mutter stated that white papers were not implementation plans. Austin said that perhaps PCOM should give more guidance to panels. Von Rad noted that SGPP has its main interests, accretionary wedges and sedimented ridges, and that these are now being addressed. Natland felt that white papers, etc., were productive to a point, but the available range of proposals does not address some problems. For example, LITHP will not discuss problems for which no proposal exists, in spite of PCOM's direction.

Austin noted that thematic panels had always wanted to review proposals. However, proposal review takes a lot of time and, now that DPG's exist, panels are passing proposals to them. This was predicted when regional panels disbanded. If thematic panels do not have the right membership, or are incapable of handling their tasks, PCOM must examine that situation. Taylor felt that PCOM could only plan if it gets advice. He reiterated his suggestion that the panels review each LRP point. Austin responded that he could tell the panels to re-evaluate the LRP, but if PCOM does not know what it thinks is important, it will not be able to judge the panels' advice.

Lancelot commented that panels do not take a leadership role. He suggested that they be charged with constructing a detailed scientific framework. Austin reiterated that PCOM must know what it wants or it cannot complain if panel rankings are flawed.

Cowan recalled the Hawaii Annual Meeting. He asked what PCOM's options were. CA could have been thrown out because it could not be done properly, but what would have replaced it? Until the technology is ready PCOM has no choice. Austin responded that Sedimented Ridges II had been dropped because of safety concerns, but he felt that PCOM's response had been inconsistent. Later in this meeting, programs to be included in the FY93 prospectus will be decided. The FY93 program will be produced from that. PCOM should think about what it wants to do in order that the North Atlantic program will be a success. Taylor felt that a longer view of the North Atlantic program than 1 year was needed. Blum noted that no program wanted more than 2 legs in a row, and only NARM-DPG wanted 2. Austin thought that might have been a reaction to what NARM-DPG thought that PCOM would do. However, Blum pointed out that NARM-DPG clearly stated that they want a year in between pairs of NARM legs.

Returning to the process of setting the ship's schedule, Austin reminded PCOM that panel chairs attended the Hawaii Annual Meeting. Lancelot had been the watchdog for NPT and had been lukewarm. Then the OHP chair had made the case that OHP must have NPT. Austin remarked that he was not saying that the North Pacific was a bad place to work, but that the issue was that the OHP chair had made a demand and PCOM was not prepared to have a point of view, even though most PCOM members thought the proposal weak. He asked PCOM whether it wanted to be liked or to be effective.

Austin sensed a range of opinions within PCOM: some are happy with the *status quo*, others feel that things could be done differently. Austin said that he would re-emphasize the motion that PCOM passed last year in his charge to the thematic panels. He felt that it was important to stress that panels be proactive, look critically at the LRP and dovetail it with their own interests. PCOM must then come to the Annual Meeting with a vision of what it wants to get out of the process. PCOM must be more proactive. If PCOM is too chaotic in its response at the Annual Meeting, perhaps it should write its own white paper.

918. Membership and Personnel Actions.

Austin stressed the need to examine critical disciplinary gaps in panel membership. He noted that there were not many nominations to make at present, but that there might be many more at the Annual Meeting.

LITHP

S. Bloomer has been invited to replace M. Perfit. S. Humphris will provide >1 nominee in future, but will not approach all of them in advance. PCOM had suggested that LITHP augment its tectonics expertise. It will meet jointly with TECP in October and enhanced cross-over of expertise will be considered.

OHP

N. Shackleton will retire as chairperson after the Annual Meeting. M. Delaney will probably replace him as chair and may attend the Annual Meeting as a guest. Austin noted that she had been very effective at OPCOM.

Duncan noted that Delaney's rotation date was 1992, but Austin explained that she would automatically get another 3 years if she becomes chairperson. Natland pointed out that the USSR representative was wrong for OHP. Sharaskin agreed and said that he would look into the matter.

SGPP

J. McKenzie has replaced E. Suess as chairperson and Suess will leave SGPP after the November meeting, as will S. Dreiss. Their departure will leave a gap in SGPP's fluid expertise. McKenzie has also stated that metallogenesis and paleochemistry are underrepresented on SGPP. (SGPP list their themes as: sea level, sediments, fluids, metallogenesis and paleochemistry.) McKenzie wishes to be an "at-large" chair, as was Suess. This would require ESF to appoint a new member.

Cita-Sironi said that the nominee proposed by SGPP was M. Camerlenghi. He would attend as a guest at the November meeting. Austin noted that PCOM should receive multiple nominees and that Camerlenghi must be only a guest in November, since panel members rotate in January. In response to a question from Pyle, Austin said that at-large members are created to achieve disciplinary balance. Taylor observed that, in that case, the at-large member should be the one being brought in for additional expertise, and not the panel chair. Austin responded that McKenzie did not mind being ESF representative and Camerlenghi could be the at-large member. It is a question of financial support. McKenzie had planned to be paid from a separate source, but if Camerlenghi became the at-large member, ESF would have to pay for both. Cita-Sironi said that was an ESF problem.

Austin asked whether PCOM should request multiple nominees. Alternatively, PCOM could make nominations. However, he added, such options would only be possible if McKenzie remains ESF representative. If McKenzie is made at-large, the other nominee would be an ESF representative and decided upon only by ESF. Cowan stated that McKenzie was the ESF representative. Austin replied that he could ask McKenzie to provide additional nominations. Duncan proposed G. Klinkhammer, whose expertise is in fluids and spreading ridges. Austin asked Duncan to obtain a CV for discussion at the Annual Meeting. Taylor noted that the CV should also go to McKenzie.

Austin pointed out that at least one replacement for Suess and Dreiss will be needed. Of SGPP's 5 themes, 3 are underrepresented. PCOM should nominate for at least 1 of the fluids vacancies, if not today then before the SGPP November meeting. Austin added that Camerlenghi will not attend as a guest in November. PCOM reached the following consensus.

PCOM Consensus

PCOM thanks Erwin Suess, who is leaving the chairmanship of the youngest thematic panel of ODP (SGPP), for his dynamic, intelligent and dedicated leadership.

TECP

Austin reported that no action is required. Mutter highlighted the lack of knowledge of extensional tectonics on the panel. He said that there were 4 individuals with such expertise, but felt that most had strong regional biases and only one had a broader view. If a replacement is needed after the next meeting, someone with broad expertise re: extension should be nominated. Austin stated that nominees would be needed. PCOM should review TECP's membership, considering white papers and the LRP, and bring to the Annual Meeting ideas on completing its expertise. Lancelot noted that the French representative, J. Bourgois (who has compressional expertise) would be rotating off. He could be replaced by, e.g., J.-C. Sibuet, who has the expertise Mutter thinks is necessary. Jenkyns pointed out that G. Westbrook had already been replaced by A. Robinson. Austin reminded PCOM that nominees would be needed in the next few weeks, before the panel meetings.

Natland commented that TECP has had a series of interactions with LITHP. TECP feels that many proposals with LITHP objectives do not address tectonics. One problem is the lack of tectonic expertise on LITHP. Another is that only one person on TECP has mid-ocean ridge experience. Austin expressed reservations about setting up sub-groups of influence. He was sympathetic to joint panel meetings, adding that panels can always nominate guests with specific expertise. Austin said that he could ask Moores (TECP chair) to evaluate TECP's membership in relation to its themes (as McKenzie had done for SGPP). Natland said that TECP seems to think that tectonic themes will come out of LITHP proposals, which is one reason that TECP ranks lithosphere proposals poorly. Austin felt that PCOM had to continue to give panels the opportunity to fix problems on their own. Mutter asked what PCOM's role was. Austin reiterated that PCOM should ask Moores to consider TECP's expertise in light of its themes. Then PCOM can impose its views: it has already pointed out the gap in lithosphere knowledge and, therefore, supported joint meetings with LITHP.

DMP

B. Carson has rotated off. The two nominees, R. Desbrandes and S. Hickman, are both willing to serve. Worthington has recommended nominating Desbrandes and "saving" Hickman until 1992.

Taylor observed that rotation dates had passed for some panel members. Austin responded that the rotation policy is less formal for service panels. Golovchenko added that Wilkins had asked to stay on DMP (he is one of the few who have sailed on a leg), but will rotate off after January. Karig will rotate off after October.

IHP

No action required. Moore has been replaced as chairperson by Gibson. Austin commented that IHP will have to deal with PEC III comments on publications. Sharaskin said that he was surprised to see Basov as the IHP nominee, as he would be better on OHP. Sharaskin said that he would discuss the matter with Bogdanov.

PPSP

No action required.

SMP

R. Chaney has been invited to replace Gibson. Since Gibson was the C-A representative, the JOIDES Office had waited for a C-A nominee. None was received, so Chaney was invited.

SSP

No action required. SSP will review its own membership in October.

Von Rad informed PCOM that K. Hinz is the new German representative, replacing H. Meyer. Mutter noted that Hinz will provide expertise on passive margins.

TEDCOM

No new ESF nominee to replace Strand has been received. Sparks would like S. Thorhallsson to join TEDCOM. Thorhallsson has been invited and will join. Austin will be at the September TEDCOM meeting, as will H. Zaremba.

NARM-DPG

NARM-DPG has had its second and presumably final meeting. Its report should be ready in September. There were some membership changes at the second meeting. NARM-DPG co-chairperson Larsen will present the report to PCOM at the Annual Meeting.

In response to a question from Mutter, Austin said that NARM-DPG will not be disbanded until the report has been reviewed. NARM-DPG could be asked to meet again. Responding to a question form Cita-Sironi, Austin said that the NARM-DPG report will be part of the North Atlantic Prospectus. Von Rad commented that new NARM proposals might be received. Austin agreed that this might happen. Such proposals would be forwarded for panel review and PCOM would have to discuss how to dovetail them with the NARM-DPG report.

OD-WG

OD-WG has met once and will meet twice more in the next year. In response to a question from Taylor on the relatively poor attendance at the first meeting, Austin explained that August is a period of many schedule conflicts. He predicted that more will attend the next meeting. Taylor felt that there was a need to clarify the membership of OD-WG, since the chairperson was not even sure. Austin said that he would take note. OD-WG membership could be augmented, if necessary.

SL-WG

SL-WG has met once and will meet again in November. There will probably be a third meeting in the spring of 1992. SL-WG would like to invite 3 speakers to its November meeting. In response to a question from Jenkyns, Austin said that one of the potential invited speakers was non-US.

LIAISONS

Cowan pointed out that the Annual Meeting would be his last PCOM meeting. He cannot attend the next DMP meeting because of a conflict and expected Becker to attend. Austin responded that the JOIDES Office would contact Becker.

Neither Lancelot nor Watkins could attend SSP in October. Austin said that he would ask Taira to attend. Tucholke could attend the LITHP/TECP joint meeting in Cyprus instead of Taira.

Taylor pointed out that OD-WG would meet twice in the spring and that he preferred not to be SGPP liaison. Von Rad said that SGPP will meet in Miami in February or March, 1992. Cita-Sironi noted that she had no expertise for her role as SMP liaison and offered to go to the spring SGPP meeting.

Austin stated that he would attend TEDCOM's next meeting, in place of Natland.

PANCHM

S. Humphris was nominated as chairperson of PANCHM, with J. McKenzie as backup nominee.

CO-CHIEFS

All co-chiefs for legs through Leg 146 have accepted their appointments. Austin suggested deferring nominations for Leg 147 until it is clear what Leg 147 will be.

PCOM passed the following motion.

<u>PCOM Motion</u>

PCOM endorses all personnel actions taken at the August meeting.

Motion Watkins, second Cowan Vote: for 16; against 0; abstain 0; absent 1

919. New Business

FORMAT OF THE FY93 "NORTH ATLANTIC PROSPECTUS"

Curry noted that he was a proponent. Austin thanked him for the notification, but did not feel that there would be any danger of conflict of interest in this case.

Atlantic programs that appear in the global rankings, down to rank 10, are listed in the Agenda Book (blue page 30). The JOIDES Office proposed that the following programs be included in the FY93 prospectus (see also Agenda Book, blue pages 29 and 31): NAAG-DPG report, NARM-DPG report, TAG hydrothermal (#361), New Jersey sea level (#348), Ceara Rise (#388), Mediterranean sapropels (#391), VICAP Gran Canaria (#380 Rev.), Alboran Basin/gateway & Mediterranean Ridge (#232 Rev. + #330) and Equatorial Atlantic transform (#346 Rev.). Proponents have been asked for revisions and most are complying. The deadline for submission of revisions is ~September 10.

Taylor pointed out that proposals globally ranked 6 and 7 by LITHP come under the purview of OD-WG. LITHP's rank 6 is Vema FZ: layer 2/3 & Vema FZ: deep crust (#376 + #382), and its rank 7 is MARK deep mantle (#369). The report of OD-WG's first meeting will be completed by September 1 and should be included in the prospectus. Natland added that he had been asked by LITHP to point out that the NARM program contained many proposals when it was ranked, but the HD, Vema and MARK proposals were ranked separately. LITHP wants to emphasize the importance of offset drilling. Mutter also felt that the Vema and MARK proposals should be included in the prospectus.

Austin pointed out that, if that was done, fairness would dictate that TECP's 6th ranked proposal, Caribbean Crust, also be included. He added that legs need to be scheduled only from January, 1993, to October, 1993. This involves only 4 legs plus an engineering leg(?). The prospectus is already very long. Taylor referred to the earlier talks on focussing ODP and noted that offset drilling was a major focus. Austin stated that he could not endorse offset drilling as a program until he received the OD-WG report. Taylor responded that a "first cut" report would be received before the deadline. Austin reported that LITHP and TECP had stated that offset drilling should not be addressed until the OD-WG report is received, but Taylor emphasized that it was an OD-WG preliminary report that he would like to see included in the prospectus. It would include revised versions of the Vema and MARK proposals. Austin asked whether the OD-WG report would constitute a drillable program. Taylor answered that it would.

Austin said that the OD-WG report would be included in the prospectus if it was received by September 10, but that individual proposals would not be included without the report. However, Curry said that PCOM could allow those proposals to be included based on the report of the OD-WG liaison. Austin agreed that if the OD-WG report was not received, both Vema FZ proposals and the MARK proposal would be included in the prospectus. Taylor said that, historically, PCOM had programs before it that would occupy >1 year when planning. Austin countered that this time the programs would occupy >2 years.

Jenkyns informed PCOM that another Alboran Basin proposal exists which will not be reviewed until after the prospectus has been produced. Austin explained that the proposal can still be ranked by thematic panels, who can review whatever they wish along with the prospectus. He noted that PCOM had included 5 LITHP items in the prospectus and asked whether other thematic panels had been fairly treated. Mutter pointed out that no further OHP preferences would be included even if proposals to rank 10 were considered. Blum pointed out that thematic panels had previously questioned the inclusion of large numbers of proposals in the prospectus. The task then becomes almost like doing a new global ranking.

In response to a question from Natland, Austin said that TAG hydrothermal does not require DCS. Austin stressed once again the need for thematic balance in the prospectus. PCOM liaisons to thematic panels must feel that their panels are getting fair treatment. In response to a question from Taylor, Austin said that it would be up to the panels to decide whether Mediterranean sapropels was mature enough to drill. PCOM must include it in the prospectus, based upon its global ranking. Austin added that if the prospectus is too unwieldy, it might not be taken seriously.

Mutter commented that panel rankings are advice to PCOM. PCOM can choose to take whichever parts of that advice it wishes. Austin countered that PCOM would be unwise to ignore thematic input. Von Rad said that the FY93 prospectus might be useful for FY94, but Austin noted that FY94 will involve not just the North Atlantic. Von Rad expected NARM-DPG to ask for 2 legs each year (1 volcanic margin and 1 non-volcanic margin). Austin commented that if PCOM decides that the NARM-DPG report is not complete, it can send it back to NARM-DPG, or even ignore it for FY93. There are enough other programs available to fill the schedule.

Taylor asked whether the equator was the dividing line for FY93 programs. Austin replied that PCOM was on record to that effect: the line had to be drawn somewhere. The definition was made at the Paris PCOM meeting. Francis reminded PCOM that the North Atlantic weather windows will be critical and von Rad pointed out that both NARM-DPG and NAAG-DPG have requested the same planning windows.

In response to a question from Taylor, Austin said that the NARM-DPG report will be prioritized leg by leg. Taylor proposed that PCOM could create a list so that all of the panels rank the same thing. Blum pointed out that PCOM had charged NARM-DPG to consider both volcanic and non-volcanic margins, but that the report will be divided into 2 parts. Austin felt that it was up to the panels to rank as they saw fit. PCOM could not ask them to rank the NARM-DPG report as 2 parts. Taylor stressed the need for a consistent ranking: for PCOM to receive input on the same slate. Mutter thought that the NARM program might be ranked differently depending on whether the volcanic and non-volcanic parts were separate or together, e.g., LITHP might only be interested in volcanic margins.

PCOM Watchdogs: "North Atlantic Prospectus" Programs

Austin moved on to discuss PCOM watchdogs, noting that the idea was to avoid having proponents as watchdogs. The following assignments were made, some of which differ from, or are additional to, those in the Agenda Book (blue pages 31-32):

Alboran Basin/gateway & Mediterranean Ridge	Cowan
Equatorial Atlantic Transform	Mutter
Ceara Rise	Watkins
Mediterranean sapropels	Cita-Sironi
VICAP Gran Canaria	Malpas

OD-WG proposals (treated together)	Taylor
New Jersey sea level	Sharaskin
NAAG-DPG	Leinen
NARM-DPG	Duncan (volcanic)/ von Rad (non-volcanic)
TAG hydrothermal	Becker

Austin said that he would write a charge to the panels notifying them of what to do with the prospectus. He would fax this charge to all PCOM members for comments/input before sending it to the panels.

JOIDES OFFICE GERIATRIC STUDY: STATUTE OF LIMITATIONS ON ODP PROPOSALS

PCOM discussed, at its April 1991 meeting, a ~3-year limit beyond which ODP proposals would be considered inactive (without additional input from proponents). PCOM decided to wait until a list was prepared by the JOIDES Office summarizing all proposals submitted and their fates. Blum has now prepared such a list (Agenda Book, white pages 217-244; see also blue pages 32-33).

Crawford pointed out that the Marion Plateau proposal (#338) should be listed as "not drilled". It still stands as ranked by OHP. Austin noted the correction and asked PCOM members to review the list and send their comments to the JOIDES Office. He added that PEC III is also interested in this list. The main focus at this meeting is whether to institute a statute of limitations.

Blum described setting up the proposal master lists and notes (also see Agenda Book, white pages 217-244). The objective was to clarify the issue of "active" vs. "inactive" proposals. These terms have been used, but not previously defined. There are now too many proposals in the JOIDES system to review and keep in the collective memory: panel memberships change substantially every ~3 years, but ODP is now 6 years old.

The approach in developing the master lists has been to asses the status of proposals. Lists have been set up on a flexible data base system. Users of the master lists (including PCOM) are assumed to be familiar with proposal submission guidelines regarding proposal categories, proposal maturity and proposal review and ranking procedures. The JOIDES Office recommendation is to institute a statute of limitations. A possible follow-up is to adopt consistent voting procedures for ranking of submitted proposals.

A proposal is "active" in the view of the JOIDES Office if:

1) it is in review (generally done only once by the thematic panels),
2) it has been ranked (not so clearly defined, e.g., OHP globally ranked 12 proposals, while LITHP globally ranked 27 proposals),
3) it has not been ranked, but was submitted after January 1, 1988 (sometimes a thematic panel is just not interested in a proposal, sometimes it just "falls through the cracks").

The JOIDES Office would like to be able to tell panels that they have to look at this basket of proposals. Each panel would have to take ~2 dozen proposals to their meetings.

A proposal is "inactive" in the view of the JOIDES Office if:

1) it has been replaced (in the past, replacement proposals were given new numbers, but this practice has been discontinued),
2) it has been sent to a DPG (although sometimes a DPG does not include all proposals sent to it; the remainder can be re-ranked by the thematic panels),
3) it has been drilled, or is on the schedule,
4) it has not been drilled and has not been updated since January 1, 1988 (if proponents are still interested in a proposal, they should update it; the JOIDES Office will advise them when the deadline is approaching),
5) it is a "ghost" (a previous version of a resubmitted proposal when the new version was assigned a different number).

Austin interjected that renumbering of the same proposal was an artifact of the rotation of the JOIDES Office. Blum cited the example of CTJ: this proposal was first assigned #8, then #308, and finally #362. Austin noted that, using the *4th Dimension®* data base, master lists can be recast and listed by date, name, etc. Lancelot asked whether he could be sent a diskette of the list. Austin agreed to do that.

Master list A (Agenda Book, white pages 221-232) is listed by date and shows that there are no ranked proposals older than ~1988 (there are only 5 ranked proposals from 1986/7). Austin noted that this was no fluke: COSOD II met in 1987. Blum presented the JOIDES Office recommendation, couched on the form of a possible PCOM motion (Agenda Book, blue page 33).

Blum pointed out that it would only be necessary to inform 3-4 proponents in January, 1992, that their proposals were about to become inactive. In order to keep a proposal active, they could send an addendum, or perhaps only a letter, so that the JOIDES Office knows that the proposal should still be kept in the system.

Austin reiterated that only a letter might be enough to indicate continued interest on the part of the proponents and maintain the proposal on the active list. The JOIDES Office wants proponents to understand that they must continue to interact with the system. PCOM might decide to advertise, in the *JOIDES Journal*, the intent to institute this policy before formally adopting it. However, Austin would prefer to adopt it immediately.

Natland commented that if PCOM ever starts real long-range planning, a 3-4 year cut-off might knock some proposals off the list. He suggested that the thematic panels review the list so that they can contact proponents if they are interested. Austin pointed out that the panels want the statute of limitations. He asked whether PCOM agreed, philosophically, that there should be a cut-off. The panels cannot keep track of all proposals: to achieve reliable ranking a cut-off is desirable. Cowan said that he had no objections to the cut-off, but expressed the concern that the 1987 perturbation might continue: proposals might no longer become inactive after 3-4 years. Austin agreed that this was conceivable, but he would like the panels to interact with the proponents of older proposals. There must be some mechanism for tracking proposals.

Von Rad felt that there were probably some "treasures" among the old proposals that might be lost. Taylor noted that former PCOM chairperson R. Moberly had asked former thematic panel chairs to identify such "treasures". The impetus for this move was that regional panels were being phased out. No proposals were identified older than January 1, 1988. Austin added that Atlantic "treasures" have all been reworked since 1988. Natland commented that thematic panels could also look for treasures. Blum explained that the JOIDES Office would send out active proposals to thematic panels. If a panel wanted an inactive proposal, it could approach the proponents. Austin added that PCOM and the JOIDES Office are doing things differently now. The panels cannot do all that is asked of them and also review proposals back to the beginning of ODP. The panels have requested a cut-off.

Taylor suggested that an explanation of what "updated" means be included in the recommendation, to let proponents know that a rewrite is not necessarily required. However, Austin noted that there were some instances when a simple letter would be insufficient. Blum commented that in most cases there should be something to add to a proposal after 3-4 years. Curry suggested creating an option for a thematic panel to decide to keep a proposal active on its own initiative. Austin said that he could ask the thematic panels to review the lists and look for "treasures".

Natland felt that the statute of limitations was fine. If a proponent did not wish to rewrite the proposal, some sort of statement should be added, by the proponent, to the body of the proposal (i.e., the introduction) noting that this was a resubmission, even if there were no other changes. Blum pointed out that if notification that a proposal should be kept active is received from a proponent it would be necessary to re-review that proposal, since there would be nobody left on the panels who remembered the initial review. Cowan suggested changing the wording of the recommendation from "updates" to "updates or resubmissions". Natland felt that some proponents would resubmit anything. Resubmissions should include at least current site summary forms. Austin agreed that more than just a letter was required. The idea is to do what the prospectus is doing now: to make proponents improve their proposals. Blum said that the resubmission should be a revised proposal, which addresses thematic panel comments. Austin added that panel comments should be addressed, even if they were only refuted. Taylor felt that some proposals did not require even that and should be allowed to remain active at the request of thematic panels. However, Lancelot thought that proponents should be forced to resubmit: the proposal could be virtually the same as the old one and a cover letter can explain why. Von Rad agreed. He asked why a number of recent proposals in the master list (Agenda Book, white pages 231-232) had not been ranked. Blum explained that they had been reviewed. "Not ranked" indicates a lack of thematic panel interest.

Blum suggested that perhaps panels should uniformly rank their top 20 proposals. Austin commented that rankings might not mean much, based on inconsistencies revealed in the SGPP rankings. Each panel has a different method. NSF has a highly standardized ranking procedure, which is not necessarily good. Mutter felt that panels should rank according to a standard procedure. Austin asked whether use of the term "not ranked" in master lists should be continued, or whether it should be replaced by, e.g., "no interest" or "not within mandate". Watkins suggested "reviewed" instead of "not ranked".

Natland suggested allowing proposals to be kept in the list by panel request. Mutter felt that the proposals in danger were the good Atlantic proposals that do not make it onto the upcoming Atlantic schedule. However, Austin emphasized that all of the good Atlantic proposals had been updated.

Austin finally said that he wished to impose a statute of limitations on proposals. He asked whether there was any dissent. There was none. Taylor agreed to the statute of limitations as long as panels can keep a proposal active at their own discretion. Austin said that he would inform panel chairs that they can scan the lists to see it they can find any old proposals (i.e., submitted prior to January 1, 1989) that they would like to keep active. Von Rad felt that panels should be urged to do so. Austin agreed, but expected little response. Natland suggested adding a statement to the recommendation to the effect that maintaining a proposal's active status would require some minimal effort on the part of proponents. Austin responded that resubmission be per the new submission guidelines recently published in the *JOIDES Journal.* Cowan felt that a proposal that becomes inactive can only be made active if a panel requests a resubmission. He agreed with that, since it would prevent proponents automatically renewing proposals like library books. Austin said that if a panel identifies a "treasure", the chair must inform the proponents. Natland asked whether a proponent could not, therefore, resubmit on his or her own initiative. Austin and Blum replied that proponents can always resubmit at any time. It was agreed that the new statute of limitations procedure would take effect on January 1, 1992. Austin asked whether that should be in the motion. He said that it probably should be, because the October issue of the *JOIDES Journal* would publicize the new procedure and that it would take effect on January 1, 1992. Mutter asked whether the JOIDES Office kept all old proposals. Austin replied that it does, since it is the ODP archive. PCOM passed the following motion.

PCOM Motion

PCOM recommends that proposals which have not been updated for three full calendar years before the present calendar year (i.e., January 1, 1988 for 1991 activities, to roll to January 1, 1989 on January 1, 1992 for 1992 activities) be declared formally "inactive". Thematic panels will be given the directive by the JOIDES Office not to review inactive proposals formally, but rather to initiate submission of proposal updates (as per revised JOIDES Proposal Submission Guidelines, published in the June 1991 *JOIDES Journal*) from proponents if there is sufficient panel interest. The community will be informed about this change in policy through the *JOIDES Journal* (see additional documentation in the August minutes).

Motion Taylor, second Tamaki — Vote: for 15; against 0; abstain 0; absent 2

In response to a question from Blum on the issue of voting procedure, Austin said that he would touch on voting procedures in his letters to the thematic panels, but that he would defer further standardization. PANCHM could discuss the issue at their meeting in December.

ODP DEPENDENCE ON THIRD-PARTY TOOL DEVELOPMENT

Austin asked whether the "Guidelines for the Monitoring of Third-Party Tools" should be modified in light of the GEOPROPS situation (see correspondence in Agenda Book, white pages 211-213). Guidelines were published in the February, 1991, issue of the *JOIDES Journal* and were designed to formalize DMP's role in seeing an outside tool through from concept to deployment. Guidelines were felt appropriate by PCOM. However, the GEOPROPS principal investigator has taken development of "his" tool to a certain point and stopped. He asked whether PCOM should address this loophole.

Cowan asked whether the GEOPROPS plan included a successful test on land. Austin explained that GEOPROPS stalled in stage B of the guidelines, "at the last hurdle". Up to that point, the third party is responsible. Malfait noted that just because a person uses a tool on board *JOIDES Resolution*, it does not mean that that tool automatically goes to ODP-TAMU. Francis stated that there might be other hurdles for GEOPROPS: it lacks a manual, and possibly engineering drawings.

Natland pointed out that GEOPROPS was a particular problem because it is, and has been, an integral part of legs already scheduled, e.g., Nankai and CA. Austin commented that perhaps PCOM should be less naive and not schedule tools over which it has no control. Lancelot suggested the alternative of having ODP-TAMU take over the development of tools PCOM wishes to schedule. Austin cautioned PCOM to be aware that, if CA is to be a hydrate leg, it will be dependent on third-party development. He added that perhaps all PCOM could do was be aware of this. Lancelot felt that the matter was in the hands of DMP. However, Austin stated that DMP should know that PCOM is increasingly concerned and should point to potential snags. He noted that Golovchenko would be at the next DMP meeting. Golovchenko said that the problem is a lack of lead time. Test dates are generally so close to the legs on which tools are scheduled that if there are any problems, the tool is unavailable for its leg.

Taylor felt that PCOM needed guidelines for itself. PCOM should be more hesitant about scheduling risky tools. Austin pointed out that that would remove the pressure to develop tools and would reduce the likelihood of funding for third-party tools. Taylor thought that scheduling of testing would be sufficient to maintain pressure for development, but that such tools should not be scheduled for science until ready. Austin stated that PCOM must be realistic when it plans the FY93 schedule. Von Rad asked what he should tell SGPP about GEOPROPS. Austin replied that he would ask the co-chief, B. Carson, and also the fluid sampling meeting to consider GEOPROPS specifically.

Francis noted that principal investigators tend not to be aware of engineering problems: they are primarily interested in what the tool can do. They also tend to underestimate costs. In addition, ODP in general may be too interested in "quick fixes". Natland commented that he would not consider scheduling a third-party tool on a leg unless it had at least been tested on land. Furthermore, he would not consider the scientific objectives of that leg which required the third-party tool. Austin noted that CA would not have been scheduled under those circumstances.

Co-Chief Items

Austin reported that EXCOM wanted PCOM to consider the issue of PCOM members serving as co-chiefs. All EXCOM wanted to know was how PCOM felt about this issue.

Lancelot said that the role of the co-chief is a matter of science and has nothing to do with conflict of interest. Cita-Sironi felt that it was a good thing if PCOM contained scientists good enough to be appointed co-chiefs. Von Rad agreed that there were advantages to PCOM members being co-chiefs. Duncan remarked that, since it happens rarely, it was not a concern. It kept high-level individuals involved in ODP's science. Curry saw no problem with PCOM members being co-chiefs, and felt that it was more important that co-chiefs be proponents.

Tamaki thought that PCOM members should not be co-chiefs, since they control planning. Watkins remarked that anyone would have to be a glutton to be a co-chief while on PCOM.

Mutter noted that there has has been criticism and believed that there was potential for conflict of interest. He thought it desirable that PCOM members be neither proponents nor co-chiefs.

Cowan felt that PCOM members should be allowed to be co-chiefs, so long as proponents on PCOM did not take part in discussion of their proposal. He had seen instances when that rule had been broken in the past. Jenkyns agreed with Cowan. The most scientifically-relevant co-chiefs must be chosen. Taylor said that his feelings were similar. He added that the issue of a person being a co-chief while on PCOM was less significant than that of a co-chief having been on PCOM when his/her leg was planned. Natland observed that he had seen PCOM members pursue a co-chief position at the expense of proponents. Furthermore, PCOM members can also influence the schedule. He stated that he would never be a co-chief on any leg on which he had had an opportunity to vote. Crawford favored picking the best person for the job, whether on PCOM or not. However, the process must be policed carefully and the outside community kept aware of the safeguards.

Austin said that he had become aware that outsiders' perceptions of PCOM and the reality are very different. PCOM must be extraordinarily aware of conflict of interest. He had informed EXCOM that PCOM is conscious of this issue. It would be worthwhile, at the Annual Meeting, for PCOM members to be aware of who are proponents. However, a potential problem is the need to maintain a quorum. A quorum was maintained at the April PCOM meeting, though 5 proponents left the room and a substitute chair was appointed during discussion/adoption of the 4-year plan. Austin noted that he was a proponent. His proposal was now part of the NARM-DPG report, but he did not feel that that removed the potential for conflict of interest. Pròponents should not take part in discussion and voting, but, at the same time, PCOM must be able to conduct business (the same applies to other panels). PCOM members also represent their institutions. Austin stated that he would like feedback from all PCOM members on this issue before the Annual Meeting.

Lancelot pointed out that PCOM members, even if their names are not on proposals, also represent a lot of lobbies. He said that he would amend his earlier statement to the effect that no PCOM member should be a co-chief who is not a proponent. In response to a question from Taylor, Lancelot said that he would leave the room if he felt very close to a program, adding that all PCOM members have a disciplinary bias. Natland felt that if he was a potential lobbyist for offset drilling legs, he should never be a co-chief.

Austin stated that the minutes would reflect that PCOM members should not be co-chiefs *in lieu* of proponents. However, the issue of proponents and discussion is a problem: PCOM must be able to conduct business. Mutter echoed Natland. He would decline co-chief nominations while on PCOM. Nor would he submit proposals during that period. He suggested checking whether proposals have a higher chance of success when a PCOM member is a proponent, in order to see if the suspicion of "insider trading" is correct. Duncan disagreed. He doubted that PCOM could be dragged along by an individual pushing their own proposal. Furthermore, he pointed out that Mutter was on PCOM because of his good scientific ideas and he should, therefore, write proposals. Mutter responded that he felt that the potential for conflict of interest existed.

Natland thought that PCOM, at its April meeting, had been excessively sensitive about excluding proponents, since only the general direction of the drill ship was being set. Austin responded that PCOM would have to work on the question of how to conduct business. Cowan suggested that, if maintaining a quorum was a problem, the alternates for proponent PCOM members also attend the meeting. It was his perception that it was harder to vote a proposal down when a proponent was on a panel. There is a subtle pressure to be supportive.

Taylor stressed that there was nobody above PCOM to provide checks and balances. Austin said that a list of proponents on PCOM would be compiled and that PCOM would then have to consider how to operate at its Annual Meeting if there was not a quorum of non-proponents. Maintenance of a quorum was essential. Institutional bias was also an issue.

Austin reported that the Annual Co-Chief Scientists Review Meeting had recommended formalizing the interaction between co-chiefs and the JOIDES planning structure prior to the cruise date (Agenda Book, blue page 34). Austin could provide co-chiefs with panel minutes and invite them to panel meetings.

Natland stated that the co-chief on Leg 136 only found out aboard *JOIDES Resolution* about some required tasks. Golovchenko said that a similar situation had occurred on Leg 137. Austin doubted that PCOM could ask busy co-chiefs to attend many panel meetings. He could provide co-chiefs with panel minutes and encourage them to contact panel chairs. Natland stressed the importance of engineering changes. Austin noted that co-chiefs help write the leg prospectus. Taylor felt that having proponents as co-chiefs would help. PCOM felt that details concerning particular cases and co-chief attendance at particular panel meetings, should be at the discretion of the JOIDES Office.

920. Future Meetings

The 1991 PCOM Annual Meeting will be hosted by J. Austin and the JOIDES Office at the University of Texas at Austin, Institute for Geophysics (Thompson Conference Center), from 4-7 December 1991. The meeting will be preceded by the Panel Chairperson's meeting at the same location on 3 December 1991. A one-day field trip will be held prior to the meeting on Monday, December 2, for participants willing and able to travel to Austin on Sunday, December 1. The field trip's content will depend on weather (if good, a drive ~100 miles west of Austin to Enchanted Rock State Natural Area, a ~1 billion year old exfoliation dome of pink granite; if bad, something more local, perhaps fossil collecting in mid-Cretaceous platform limestone exposures around Austin).

The 1992 Spring PCOM meeting will be hosted by R. Duncan at Oregon State University, College of Oceanography, from 21-23 April 1992. A one-day field trip will be held on Monday 20 April, preceding the meeting, in the Coast Ranges (in all weathers). Attendees can fly to either Eugene or Portland and arrangements will be made through Allison Burns at JOI, Inc. to collect people at airports.

The 1992 Summer PCOM meeting will be hosted by J. Malpas, probably in Newfoundland, Canada. Tamaki noted that IGC and the Asian Marine Geology Conference conflict with the proposed dates (18-20 August). He suggested 11-13 August. Austin said that he would check with Malpas. A field trip may be held following the meeting.

The 1992 PCOM Annual Meeting was to have been hosted by J. Mutter at Columbia University, Lamont-Doherty Geological Observatory. However, Mutter noted that the weather in New York in December would not be favorable and suggested changing the order of PCOM meetings so that the meeting at LDGO could be in the spring. It was agreed that the 1992 Annual Meeting would be hosted by the University of Miami, Rosenstiel School of Marine and Atmospheric Sciences in November/December. Austin pointed out that PCOM usually meets during the week preceding AGU (AGU will be held on 7-11 December, 1992). No further details are available at the time of writing of these minutes.

921. Adjournment

Austin thanked the Bundesanstalt für Geowissenschaften und Rohstoffe, U. von Rad and D. Maronde, for hosting the August PCOM meeting.

The meeting was adjourned at 3:25 PM.

APPENDICES ATTACHED TO THE 20-22 AUGUST, 1991 PCOM MEETING

1. NSF report, supplemental information
2. JOI, Inc. report, supplemental information
3. Science Operator report, supplemental information
4. Wireline Logging report, supplemental information
5. EXCOM motion reconfirming messages to PCOM
6. Comparison of SGPP Atlantic ranking with global ranking
7. NARM-DPG, supplemental information
8. OD-WG, supplemental information
9. Comparisons between 1990 and 1991 global rankings of thematic panels
10. Science Operator engineering report, supplemental information
11. Report of co-chair of JOIDES-FDSN liaison group
12. Supplemental science proposals, supplemental information
13. Enewetak Atoll engineering test of shallow-water drilling
14. Guidelines for the Monitoring of Third-Party Tools

HANDOUT DISTRIBUTED AT THE 20-22 AUGUST, 1991 PCOM MEETING

1. Letter from R. Larson to J. Austin re: supplemental science proposal S-2

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000065

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

Atlantic Geoscience Centre
Bedford Institute of Oceanography
Halifax, Nova Scotia
Canada

RECEIVED
NOV 0 1 1991
Ans'd...........

15-17 October 1991

EXECUTIVE SUMMARY

1. A key feature of this meeting was the joint session with the JOIDES Shipboard Measurements Panel directed at reviewing the current status of the shipboard integration of core and log data. Other important aims were to review the report of the JOIDES Working Group on In-situ Pore Fluid Sampling and to examine special logging needs for upcoming legs.

2. The Panel set a new DMP record on 16 October 1991, sitting from 0830 to 1945 hours, a session which broke the previous record (Townsville, Queensland, 13 October 1990) by 21 minutes.

3. The excellent performance of new tools on Leg 139 was seen as constituting a phenomenal success for the ODP downhole-measurements programme.

4. DMP strongly recommends that the Phase I Strategy for advancing the Geoprops Probe to the status of an ODP Development Tool prior to Leg 146, as outlined by ODP-TAMU, should be progressed as a matter of urgency.

[DMP Recommendation 91/16 : to ODP-TAMU, Leg 146 Co-chiefs]

5. Panel endorses the Report of the JOIDES Working Group on In-situ Pore Fluid Sampling as modified.

6. A steering group should be formed to direct the implementation of the Working Group Report on In-situ Pore Fluid Sampling. The steering group should comprise representatives of LDGO, TAMU, DMP and SGPP, with a PCOM Liaison. The group should properly represent the areas of geochemistry, downhole measurements, and drilling and tool engineering. The steering group should meet as soon as (OPCOM) funds become available in order to progress the initiative and to contribute to the design of a request for proposals for a feasibility study. It should meet again to evaluate and decide upon the resulting bids. The group should meet a third time to review the output of the feasibility study. The composition of the steering group should be as follows:

ODP-TAMU Representative(s)	(Engineering)
LDGO Representative(s)	(Tool Engineering, Downhole Measurements)
SGPP Representative	(SGPP, Geochemistry)
R. Desbrandes	(DMP, Downhole Measurements)
J. Gieskes	(DMP, Geochemistry)
P.F. Worthington	(DMP, Downhole Measurements)
K. Becker	(PCOM, Downhole Measurements)

Day-to-day supervision of appointed consultants and contractors should be the responsibility of ODP-TAMU.

[DMP Recommendation 91/17 : to PCOM]

7. If gas hydrates are encountered, and it is intended to characterise them, logs should be run as soon as possible after an adequate "rat hole" has been drilled beyond the zone of interest, in order to minimize alteration. The logging suite should include the following tools: temperature, pressure, density, neutron, full waveform sonic, gamma ray, dual laterolog, geochemical (capture and inelastic modes), spherically focused, caliper and FMS. The density-neutron tool combination should be run separately from the sonic to enhance data quality.

[DMP Recommendation 91/18 : to LDGO, Legs 141/146 Co-chiefs]

8. The Japanese Downhole Magnetometer that is scheduled for use on Legs 143 and 144 should be deployed through a separate logging run to ensure safe and secure operations.

9. Panel reiterates its earlier Recommendation 91/7 to the effect that the previously aborted programme of logging at Hole 801C should be carried out around Legs 143 and 144. Panel notes that this is the oldest oceanic crust encountered in the Pacific, that there are indications that the older crust may be geochemically different from younger crust, and that the basement penetration of less than 150 m is not an impediment to the acquisition of useful physicochemical data. Panel also recognizes that failure to log the hole would constitute a lost scientific opportunity.

10. The supplemental science proposal to log Hole 801C should be upgraded from the status of an alternative site to a scheduled site either as part of Leg 143 or 144 or as a stand-alone subprogramme as proposed.

[DMP Recommendation 91/19 : to PCOM]

11. The feasibility study for alternative platforms should consider logging requirements at the outset. In particular, hole diameter should be maintained.

12. A public information brochure on ODP downhole measurements should be produced with the primary goal of educating the technical community. This brochure should draw upon modern graphic-art skills to illustrate vividly the successes of the downhole-measurements programme. There is also a need to inform the lay community. This might be achieved by a separate brochure or preferably by incorporating a downhole-measurements exposition into general ODP public information literature. The latter approach would emphasize logging as an integral part of ODP. The higher priority is the need for technical education.

[DMP Recommendation 91/20 : to LDGO, ODP-TAMU]

13. DMP and SMP agreed that the routine shipboard integration of core and log data is a very high priority and that implementation should proceed as a matter of urgency.

14. In logged holes where the APC has been deployed, the natural gamma log should be run through casing to the surface, to enhance core-log integration.

[DMP Recommendation 91/21 : to PCOM, LDGO]

15. At multi-hole (paleoceanographic) sites logging should be carried out in holes other than the last to be drilled, where there are clear scientific benefits to be gained from so doing. The flexibility to effect these decisions should be an integral part of the shipboard culture.

[DMP Recommendation 91/22 : to PCOM, LDGO, ODP-TAMU]

16. DMP and SMP identified four important areas of activity which have to be optimised if the shipboard integration of core and log data is to be progressed. These are Integration Philosophy and Personnel, Equipment, Reference Depth, and Data Handling. Specific goals and tasks were identified in all four areas.

17. The following critical tasks must be addressed for successful core-log integration in interactive mode on board the JOIDES Resolution.

    (1) Quantify contemporary methods of depth measurement for drillpipe and wireline.

    (2) Refer all depths to the (pipe-tied) gamma log.

    (3) Develop interactive graphics for depth matching.

    (4) Establish a relational database with an adequate structure and administrative mechanism.

    (5) Create the position of Data Correlation Specialist as a member of the scientific party.

    (6) Disseminate information throughout the scientific party in a readily transportable mode.

    (7) Support the related development work currently taking place at TAMU.

[DMP Recommendation 91/23 : to PCOM, LDGO, ODP-TAMU]

18. To facilitate the above recommendation, the following additional recommendation was formulated:

An independent assessment of drillpipe extension and cable stretch should be undertaken conjunctively by LDGO and ODP-TAMU.

[DMP Recommendation 91/24 : to LDGO, ODP-TAMU]

19. Where buoyant spheres have been wired to a re-entry cone, this installation should be recorded and notified to organisations who have indicated that a submersible is to visit that hole.

[DMP Recommendation 91/25 : to ODP-TAMU]

20. Dan Karig is rotating off DMP: a replacement nomination has been forwarded to PCOM.

21. The next DMP meeting is scheduled to take place in Kailua-Kona, Hawaii, during the period 28-30 January 1992.

PAUL F WORTHINGTON
28 October 1991

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

Atlantic Geoscience Centre
Bedford Institute of Oceanography
Halifax, Nova Scotia
Canada

15-17 October 1991

MINUTES

Present

Chairman:	P.F. Worthington (UK)
Members:	R. Desbrandes (USA) J. Gieskes (USA) M. Hutchinson (USA) P. Lysne (USA) R. Morin (USA) C. Sondergeld (USA) M. Williams (USA) H. Crocker (Canada/Australia) H. Draxler (FRG) J.-P. Foucher (France) O. Kuznetzov (Soviet Union) M. Yamano (Japan)
Liaisons:	K. Becker (PCOM) X. Golovchenko (LDGO) T. Janecek (ODP-TAMU) J. McClain (LITHP)
Guests:	R. Anderson (LDGO) K. Moran (SMP)* J. Pocachard (CEA, France)**
Apologies:	D. Karig (USA) R. Wilkens (USA) N. Balling (ESF) J. Mienert (SGPP) B. Carson (Lehigh Univ)

* Present for agenda items 6(ii) and 17 only.
** Present for agenda item 6(iv) only.

N.B. Agenda item 17 was conducted in joint session with the JOIDES Shipboard Measurements Panel. The minutes pertaining to this item have been agreed jointly.

000070

1. Welcome and Introductory Remarks

The meeting was called to order at 0840 hours on Tuesday 15 October 1991. The Chairman welcomed attendees to the third and final DMP meeting of 1991. A special welcome was extended to the two new panel members who were attending for the first time: Robert Desbrandes, who was replacing Bobb Carson, and Oleg Kuznetzov as the representative of ODP's newest international member, the Soviet Union. Ove Stephansson has resigned from DMP due to work commitments in his new position: he will be replaced by Nils Balling who was unable to attend this meeting.

The Chairman explained that this DMP meeting was being held one month later than usual in order to allow a joint session with the JOIDES Shipboard Measurements Panel whose chairperson, Kate Moran, had not been available in September. This joint session was a key feature of the meeting: it was planned to review the current status of the shipboard integration of core and log data and to identify the best way of progressing the initiative. Other key aims of the meeting were to review the report of the JOIDES Working Group on In-situ Pore Fluid Sampling, to examine special logging needs for upcoming legs, and to review the status of high-temperature downhole-measurement technology.

Review of Agenda and Revisions

The Chairman noted that Dr Jacques Pocachard of the French CEA will be reporting instead of Foucher on the French Sediment Magnetometer (Item 6(iv)). This presentation would take place at 1630 hours on 15 October.

McClain would provide a LITHP liaison report under new agenda item 5(iii): this report would also encompass messages from TECP with whom LITHP had met jointly.

With these modifications the precirculated agenda was adopted as a working document for the meeting.

2. Minutes of Previous DMP Meeting, LDGO, New York, 4-6 June 1991

The following modifications were proposed:

(i) Page 7, Section 5(v), Paragraph 2, Line 2.

Replace "subduction zone off Tasmania" with "Southern Ocean"

(ii) Page 26, Paragraph 4, Line 2.

Replace "leased" with "loaned".

(iii) Page 26, Paragraph 4, Line 4.

Replace "a Sandia tool" with "one of the Sandia tools".

With these modifications the minutes were adopted as a fair record.

Matters Arising

The Chairman reported that he had visited the JOIDES Resolution during the San Diego port call in July. One of the Co-chiefs, Earl Davis, had pronounced himself well satisfied with the status of downhole-measurement hardware that was available for the upcoming Leg 139. The Chairman had also been present in Victoria BC during the port call immediately after Leg 139. It was evident that Leg 139 had been a great success, both generally and from a downhole measurements standpoint.

3. OPCOM Report

The Chairman reported on the meeting of the JOIDES Opportunity Committee (OPCOM), which met in Washington DC on 7 June 1991. The meeting had been convened to examine how an additional $ 2.1 million, recently made available to ODP for FY 92, might be most effectively used to progress technological developments that are needed to pursue the scientific goals of the ODP Long Range Plan (LRP). This additional sum was seen as a "step" rather than a "spike" in funding and, as such, OPCOM extended their deliberations to include FY 93.

OPCOM recognised that the development of the Diamond Coring System (DCS) was critical for the attainment of LRP goals and that this should receive priority. Other important targets required the development of key downhole tools, in particular a slimhole high-temperature resistivity tool and an in-situ pore fluid sampler, and the incorporation into ODP of alternative platform(s).

OPCOM recommended the following apportionment of expenditure in decreasing order of priority.

		$ million FY 92	FY 93
1.	Diamond Coring System	1.675	as needed
2.	High-temperature Resistivity Tool	0.150	0
	In-situ Pore Fluid Sampler	0.175	0.175
3.	Feasibility of Alternative Platforms	0.100	?

The Chairman noted that the Minutes of the August 1991 PCOM meeting were contradictory. On the one hand, they agreed with the DMP Chairman's recollection of the above priorities. However, the Minutes also stated that the OPCOM recommendations (other than DCS) were not in priority order. The distinction is important because PCOM modified the lower OPCOM "priorities", which are not listed here, to include a recommendation for $ 0.1 million to be spent on a deep drilling feasibility study in each of FY 92 and FY 93. Clearly, if admitted, such an expenditure would impact on the apportionment of funds for the higher priorities listed.

4. PCOM Report

Becker reported that he had not been present at the August 1991 meeting of PCOM, having sailed on Leg 139, and therefore he could only convey what was contained in the PCOM draft minutes. Four DMP Recommendations had been put forward for discussion by PCOM.

Rec. No.	Description	PCOM Response
91/10	Testing of Geoprops Probe during Leg 141	Geoprops is not ready but the Motor-driven Core Barrel (MDCB), essential for Geoprops deployment, is ready and will be tested on Leg 141.
91/12	Proper casing of re-entry holes to facilitate logging	Discussed in the context of the need for an increased number of re-entry holes. Proposals are needed for specific sites. Logging-friendly completions need to be specified prior to drilling.
91/13	Casing of deteriorated re-entry holes in North Atlantic	
91/15	Logging during Leg 140 if Hess Deep	Convey to Co-chiefs

Other DMP recommendations had been made implicitly through PCOM to other parts of the ODP network.

91/11 (LDGO)	Minimum tool masses	Included within 3rd party tool guidelines
91/14 (LDGO)	High-T memory temperature tool for Leg 139	Loaned by Sandia

Becker reported two other major items.

The Geoprops Probe is scheduled for Leg 146 but it is not ready for testing on Leg 141. A development plan is emerging which might allow testing on Leg 143 (see Item 6(i)).

Three supplemental science proposals were received, only one of which (logging at 801C in old Pacific crust) satisfied the time specifications. This proposal was not accepted but relegated to the status of an alternative site for Legs 143 and 144. The practice of supplemental science is to be discontinued but proposals for short studies will still be welcomed.

The Chairman thanked Becker for his report which had been based solely on the PCOM minutes. The PCOM discussion of DMP Recommendations 91/12 and 91/13 had not focused on the specific issues but had digressed to a more general, and not altogether relevant, discourse. Although this perception had been exacerbated by the temporary liaison problems, there is a need for some sharpening of the rapport between PCOM and DMP. The Chairman will talk to other service panel chairs to see if the problem is generic.

[ACTION: WORTHINGTON]

5. Liaison Reports

(i) TEDCOM

The Chairman reported on the meeting of TEDCOM held in Victoria BC during the period 11-12 September 1991. This report is attached as Annexure I.

(ii) KTB

Draxler reported that the main hole had reached a depth of 4512 m. Current diameter is 14.75 inches. Bottom-hole-temperature is 116°C, which is less than that at 4000 m in the nearby pilot hole. This disparity is attributed to hole cooling while drilling. A Schlumberger gyro log has confirmed that the hole is very close to vertical (maximum inclination 1.6°). The Eastman-Christensen vertical drilling system should be deployable until about 6000 m if temperature and hole-cooling estimates are reliable.

Since the main hole is now deeper than the pilot hole, coring has recommenced. Five cores have been recovered within the depth range 4149-4457 m. Average core length was 8.6 m: average recovery was 3.7 m (43%).

Logging is currently being undertaken. The suite includes the (ODP) standard logs plus fluid sampling, induced polarization and self potential tools, among others. The formation micro-imager is being run instead of the FMS. The DMT BHTV tool has been withdrawn because it does not produce useful results under the prevailing conditions. The signal would be reduced by a factor of 6-7 in a 14.75 inch hole with Dehydril/Hostadrill mud. There is no viable alternative that satisfies technical and fiscal needs.

The hydrofrac experiment was unsuccessful and has been terminated. A new experiment is being proposed. A three-month production test is being run in the pilot hole to sample fluids: production rate is 5-7 litres/minute.

ODP and KTB held a joint meeting in Hannover on 24-25 July 1991 to discuss possible collaboration in the area of high-temperature logging. Another joint meeting is scheduled for June 1992, immediately following the proposed DMP meeting in Windischeschenbach.

(iii) LITHP

McClain reported on the joint meeting of the JOIDES Lithosphere and Tectonics Panels held in Cyprus during the period 9-11 October 1991. LITHP ranking of the North Atlantic Prospectus was:

(1) Trans-Atlantic Geotraverse (TAG)
(2) North Atlantic Rifted Margins - second leg of volcanic programme
(3) Offset Crustal Drilling
(4) North Atlantic Rifted Margins - first leg of non-volcanic programme
(5) Vicap - Gran Canaria

LITHP endorsed the OPCOM priorities including the PCOM addendum, the deep drilling feasibility study. However, LITHP recognized that this study would merely indicate time-scale and costs, rather than provide solutions and exact cost estimates.

LITHP considered that logging at 801C in the old Pacific crust merited sacrificing 3 days worth of LITHP goals during the Atolls and Guyots legs.

There was concern that the Geoprops Probe might not be ready for Leg 146 (Cascadia). In addition to a general fluid sampling capability, LITHP wanted to see a capability for pore pressure, temperature and permeability. It was recognized that this capability already exists in various forms. However, there needs to be tight control where third party tools are involved.

McClain concluded by stating that a liaison from TECP to DMP was evidently needed. The Chairman responded by reminding the Panel that DMP had previously recommended such a liaison (DMP Recommendation 90/14) but that this recommendation had not been accepted by PCOM on the grounds that a liaison was not in the mandate of TECP (DMP Minutes, October 1990, Page 3). Any new initiative ought to come from TECP. McClain undertook to contact TECP Chairman with a view to progressing the liaison issue.

[ACTION: McCLAIN]

6. Tool Monitor Reports

(i) Geoprops Probe

The Geoprops Probe is scheduled for deployment on Leg 146. The discussion was disadvantaged by the unavoidable absence of Bobb Carson (Leg 146 Co-chief) and Dan Karig (Geoprops Proponent). The Chairman summarized recent events based on material received from PCOM, ODP-TAMU, Carson and Karig. A detailed report by ODP-TAMU on the feasibility of continued development of the Geoprops Probe is appended as Annexure II.

The chronological summary is as follows.

(1) In designing the Geoprops Probe, Karig has created an ingenious device which can be made to work. In order to bring the tool to fruition, there is a need for engineering input at the consultancy level.

(2) Bench tests carried out at TAM, Inc., on 26 June 1991 revealed three residual problems, two of which have already been rectified.

(3) TAM, Inc., consider that they have now discharged all their contractual obligations.

(4) ODP-TAMU engineers consider that several further tests are needed before the Geoprops Probe can be accepted as an ODP Development Tool, in accordance with DMP's guidelines for third-party tool development, for deployment on Leg 146.

(5) PCOM have reaffirmed (August 1991) the critical importance of the Geoprops Probe, or a comparable tool, as an integral part of scientific planning. PCOM have recommended that OPCOM funds be made available as soon as practicable to further this aim.

(6) OPCOM funds are unlikely to become available before January 1992.

(7) Geoprops has to operate in conjunction with the MDCB. This aspect of the operation can only be tested at sea. These sea trials should take place at least two legs prior to Cascadia (DMP Recommendation 91/2).

(8) ODP-TAMU have proposed a two-stage development plan for Geoprops, one phase to bring it to the status of "ODP Development Tool" and the second to progress it further to the status of "ODP Mature Tool", as per DMP guidelines. It is necessary to complete Phase I prior to Cascadia.

(9) Phase I would consist of testing, modifications, and preparation of support equipment, spares and documentation. This work would be the responsibility of ODP-TAMU but, in order to minimize its impact on in-house engineering manpower, it would be undertaken largely by an external consultant. Modifications to the two existing tools would be minimized. The objective would be to have sea trials on Leg 143 (4 MDCB/Geoprops runs would require two days of ship time, but might contribute to the scientific objectives of that leg) and operational deployment on Leg 146. The cost of this phase, excluding ODP-TAMU staff time, is estimated at $ 33 000.

(10) In order to complete Phase I in time for Cascadia, ODP-TAMU must have funding approval no later than 1 November 1991. Bobb Carson is looking at ways of securing the funding within this time-frame.

On the basis of this exposition, Panel made the following recommendation.

DMP Recommendation 91/16

"DMP strongly recommends that the Phase I Strategy for advancing the Geoprops Probe to the status of an ODP Development Tool prior to Leg 146, as outlined by ODP-TAMU, should be progressed as a matter of urgency."

The Chairman re-emphasized that Geoprops needs a functioning MDCB before it can be deployed. Until the MDCB is declared fully functional, Geoprops cannot be construed to have delayed the programme. However, once MDCB is declared functional, an uncompleted Geoprops would delay the programme from that point onwards.

(ii) LAST

Moran reported on the Phase-1 tool, which measures pore pressure and provides an estimate of lateral stress. The tool is deployed as a shoe on the APC and XCB: it can only be used during APC and XCB operations. The tool is awaiting replacement parts. It will be ready for Cascadia.

The Phase-2 LAST tool is similar to a pressure meter. It measures pore pressure and true lateral stress. It allows shear-strength and shear-modulus parameters to be determined in situ. The tool is pushed ahead of the bit and it might be possible to deploy it beyond the APC/XCB range. One component has failed during laboratory storage. The tool has only been subjected to land tests. It is hoped to test it at sea during the Chile Triple Junction leg (141) prior to its proposed deployment at Cascadia.

Moran noted that the Adara temperature tool, which performed so well during Leg 139, was developed by modifying the basic design of LAST. This is a clear benefit to industry.

(iii) BGR Borehole Magnetometer

Draxler reported that work on the tool has recommenced. Tool diameter is 3.625 inches. A redesigned sensor, which allows a faster logging speed, is internally rated to 125°C. The tool is dewared to withstand an environmental temperature of 260°C for 10 hours without the internal temperature exceeding 120°C. Final tests will take place in about 5 weeks' time. The tool should be ready for ODP deployment in 3-4 months. Draxler enquired about the opportunities for incorporating the tool into an upcoming ODP leg. Golovchenko will investigate.

[ACTION: GOLOVCHENKO]

(iv) French Sediment Magnetometer

Jacques Pocachard of the French CEA, one of the organisations involved in the development of a high-resolution sediment magnetometer, reported on progress to date. The tool has two components, each of which can be run separately. One tool (SUMT) uses an electromagnetic sensor to measure susceptibility. The other (NRMT) is a scalar magnetometer which measures total induction (remanent and susceptibility effects). Both tools are 9.3 cm in diameter, are rated to 125°C, and are run with a logging speed of 0.15 - 0.30 m/second. Data processing draws upon information about the prevailing earth's field from a nearby reference station, which is best sited on land. The output is natural remanent magnetisation which can be used to study reversals.

Pocachard presented examples of the tool's deployment in different geological provinces. Panel encouraged these developments and the Chairman thanked Pocachard for taking the time out to address DMP.

(v) Japanese Downhole Magnetometer

Yamano reported that tool development had been contracted and it was believed that the tool would be ready for Legs 143/144. The tool is housed in three pressure cases for battery, electronics and sensor. It is 3.5 m long, 67 mm in diameter and has a mass of 65 kg. The tool is a memory device and is intended to be run at the bottom of a Schlumberger tool string.

Golovchenko reported a concern that the tool is not sufficiently strong to support the weight of a (long and heavy) standard Schlumberger tool string. The wall of the pressure casing is not very thick and, if the tool should hit the bottom of the hole or it should be necessary to punch through bridges, there is a risk of the magnetometer bending and the entire Schlumberger string being lost.

Yamano said that according to the manufacturers, the tool can withstand 4 tonnes load. It was pointed out that an earlier version of this tool had been attached to a BHTV. Would that obviate the problem?

Golovchenko responded that we now lease BHTV tools and it is imperative that these are not put at risk. She suggested that the magnetometer be run separately.

Panel considered that the issue reduced to one of safety and that risk should be contained as far as possible.

DMP Consensus

The Japanese Downhole Magnetometer that is scheduled for use on Legs 143 and 144 should be deployed through a separate logging run to ensure safe and secure operations.

(vi) Flowmeter

Morin reported that the problem with packer deflation experienced on Leg 137 has been solved. The tool worked well on Leg 139. It is out on the ship now for deployment in Hole 504B. It is proposed to deploy the tool again at Cascadia (Leg 146).

In closing the discussion on tool developments, the Chairman noted varying degrees of compliance with the ODP Guidelines for Third Party Tools. It was proposed to re-examine this question in detail at the next DMP meeting. In the meantime Panel were reminded that if they become aware of any new third-party tool concept that might advance the cause of ODP downhole-measurement science, they should present this to the Panel for discussion and evaluation at an early date, in order to allow maximum time for development and thence compliance with the guidelines.

7. Operations Report : Legs 138 - 140

Golovchenko, Janecek (who had been on Leg 138) and Becker (Leg 139) reported on operational aspects of these three legs.

Leg 138 was the first leg in a tectonically active area with sufficient boreholes to evaluate directional stress differences between three plates. The elliptical form of the holes due to differential stress allowed principal stress directions to be delineated.

Leg 138 was also a milestone for core-log integration, driven by Tom Janecek. The leg set a record for core recovery. It was noted that the density log recorded a lower density than GRAPE. Since this is the opposite effect to swelling, and one would expect GRAPE to err on the low side due to core stretching, a GRAPE calibration error is suspected. It was noted that the difference between the log and GRAPE densities increases as calcium content decreases. Data calibration of logs and MST is a prerequisite for effective core-log integration.

Leg 139 had been in the minds of DMP since the Panel met jointly with LITHP in 1989. At that meeting, temperature measurement in high-temperature environments was identified as a prerequisite for the success of legs with hydrothermal objectives. At the June 1991 meeting of DMP, just one month before Leg 139, it was not clear that we would have an adequate temperature tool. In fact, following a flurry of activity, the ship sailed with five tools. All of these performed well and thanks were due to all contributors, Peter Lysne at Sandia, JAPEX, etc. The Panel's role in aggressively focusing on these tool requirements had also had a key impact.

More specifically, the temperature tools that sailed on Leg 139 were (with their ratings): JAPEX PTF Sonde (375°C), Sandia GRC Temperature Sonde (400°C), BRGM Tool (500°C), Comprobe PFC Tool (125°C) and a Kuster Mechanical Temperature Tool (375°C).

The performances of new tools deployed on Leg 139 were as follows.

Tool	Memory (M) or Wireline (W)	Success Ratio
Sandia GRC Temp	M	11/11
JAPEX PTF	W	8/8
Adara APC Temp	M	22/24
Strengthened WSTP	M	~15/20
Comprobe Flowmeter	W	2/2
GRC Pressure (Packer)	M	5/5
LANL Fluid Sampler	M	1/1
Instrumented Seals	M	2/2

Becker stated that this performance constituted a phenomenal success for downhole measurements and that it should be promoted as such.

No excessively high temperatures were recorded during Leg 139, primarily because of hole cooling. The maximum temperature encountered was 260°C. There were no H_2S problems. The packer/flowmeter system worked well. GLT and FMS data were recorded in a giant sulphide body discovered during Leg 139: this discovery had aroused great interest among Canadian geoscientists as evidenced at the Victoria port call. In other respects there were some problems with Schlumberger logging because of the absence of a wireline heave compensator. The FMS stuck twice: one of these incidents necessitated cutting the vector cable.

At Hole 858F one of the successful deployments of the Sandia GRC tool saw the tool break off, feared lost. The tool was recovered 20 hours later. This outcome proved highly opportune because the tool has 20 hours of preprogramming and was able to record temperature build-up over this period. Environmental temperature rose from 60°C to 180°C: the temperature of the electronics rose from 15°C to 80°C.

The Comprobe Flowmeter Tool measured a downflow of 10 000 litres/minute in Hole 857D. A log of flowmeter count with depth in hole showed that all this water is entering one 5 m interval of high permeability.

At Hole 858G a temperature log run prior to sealing measured 200°C at a depth of 20 m below sea floor. This feature was ascribed to hot water flowing laterally, most likely to nearby vents. At greater depths there was hole cooling because of water being sucked down to a permeable basement.

Borehole seals were emplaced on Holes 857D and 858G. Both were visited 20 days later by ALVIN to recover data in the form of a depth log of temperature. It was found that 857D was still recovering from the hydrothermal disturbance caused by drilling. Little temperature change with time was seen at Hole 858G because a nearby pilot hole in hydraulic contact with 858G was sucking fluids from the ocean. Becker showed Panel a video of this visit.

A message from Leg 139 is that memory tools were preferred to wireline tools for temperature measurement because they avoid the time to rig up for logging. This is relevant to planning for the East Pacific Rise (EPR).

Interesting temperature data have been recovered from Hole 504B as part of the current Leg 140. A comparison with temperature data obtained on Legs 111 and 137 show that the hole has changed from sucking fluids to not sucking. This provides some insight into the nature of variations in hydrothermal activity.

As regards the speciality tools on Leg 140, there are two BHTVs (one of conventional diameter, the other slimhole) and the temperature tools include the BRGM tool rated to 500°C. Both FMS tools have been damaged, one on Leg 139, the other during Leg 140. The latter incident was related to the high temperature at 504B. The Chairman has written to Schlumberger asking that the repairs to the FMS be given the highest priority.

8. Logging Contractor's Report

Golovchenko reported that advertisements had been placed for a Chief Project Scientist to replace Rich Jarrard. The FY92 budget makes provision for three new positions (reflecting the much greater use of log data by the community), computer hardware and software, developing the high-temperature (350°C) resistivity tool, and a Schlumberger workstation upgrade. MAXIS will not be acquired until FY 93. High-temperature (350°C) logging cable and the BRGM high-T (500°C) temperature tool have been acquired. LDGO has run up a $ 150 000 deficit over the past two years. Part of the problem has been that most of the annual increase in budget is absorbed by Schlumberger price increases leaving the LDGO BRG portion effectively flat. The new budget (FY 92) is better. A Performance Evaluation of the logging contractor has recently been made: this was the third since ODP began.

An ODP "retreat" involving NSF, JOI, JOIDES, TAMU and LDGO is to be held in two weeks' time with the object of establishing a four-year programme of technical development. Golovchenko asked what DMP would require.

The Chairman had not been approached for input to the retreat. DMP's needs had been stated frequently and they relate to the downhole-measurements technology required to achieve the goals of the LRP. They are high-temperature logging, slimhole logging and pore fluid sampling. The fusion of two of these into high-temperature slimhole logging is very much tied to the success of the DCS. The introduction of the MAXIS data acquisition, storage and processing facility might necessitate some changes to the tool strings. Cooperative efforts with industry and with other programmes should be sought.

Anderson gave his views of how the world had changed since ODP was initiated. It was necessary for ODP and its constituent groups to respond positively to these changes because they provide opportunities for us to do things better. Anderson provided a forward view of the ODP downhole measurements programme and how it might be carried out. This view generated much Panel discussion.

To take matters further, the Chairman proposed the following course of action.

On or before 16 November 1991 Panel Members should send to Anderson their views on and input to his forward vision.

[ACTION: PANEL]

Anderson will then use this material in drafting a white paper that encompasses his forward vision.

[ACTION: ANDERSON]

DMP Chairman will liaise with Anderson from 16 December 1991 onwards to progress the draft white paper to an agreed stage.

[ACTION: WORTHINGTON]

The revised draft will be circulated to DMP members prior to the January Panel meeting. Members will then be asked to provide their comments on the text.

[ACTION: PANEL]

The Chairman thanked Anderson for accepting the invitation to set out these views and for doing so in a way that had stimulated so much Panel interest. He looked forward to working with Anderson on the white paper.

9. JOIDES Working Group on In-situ Pore Fluid Sampling

Panel reviewed the Report of the JOIDES Working Group on In-situ Pore Fluid Sampling, which met in Houston, Texas, on 23 August 1991. A number of modifications were proposed. The revised document, as endorsed by the Panel, is attached as Annexure III.

DMP Consensus

Panel endorses the Report of the JOIDES Working Group on In-situ Pore Fluid Sampling as modified.

Panel discussed the implementation of the Report. A particular concern was that the views of the scientific community should be input continuously as the project evolved. To this end, Panel recommended the following course of action.

DMP Recommendation 91/17

"A steering group should be formed to direct the implementation of the Working Group Report on In-situ Pore Fluid Sampling. The steering group should comprise representatives of LDGO, TAMU, DMP and SGPP, with a PCOM Liaison. The group should properly represent the areas of geochemistry, downhole measurements, and drilling and tool engineering. The steering group should meet as soon as (OPCOM) funds become available in order to progress the initiative and to contribute to the design of a request for proposals for a feasibility study. It should meet again to evaluate and decide upon the resulting bids. The group should meet a third time to review the output of the feasibility study. The composition of the steering group should be as follows:

ODP-TAMU Representative(s)	(Engineering)
LDGO Representative(s)	(Tool Engineering, Downhole Measurements)
SGPP Representative	(SGPP, Geochemistry)
R. Desbrandes	(DMP, Downhole Measurements)
J. Gieskes	(DMP, Geochemistry)
P.F. Worthington	(DMP, Downhole Measurements)
K. Becker	(PCOM, Downhole Measurements)

Day-to-day supervision of appointed consultants and contractors should be the responsibility of ODP-TAMU."

Panel acknowledged the contribution of Dave Huey of ODP-TAMU who had co-convened the working group meeting with DMP Chairman.

10. Log Data Acquisition, Processing and Distribution

This agenda item is a subset of the discussions under Item 8. It was decided to defer this item to the next DMP meeting when the white paper defining the "big picture" should be available.

11. Legs 141 - 147

Janecek introduced the upcoming Pacific programme in terms of the downhole-measurement schedule.

(i) Leg 141 - Chile Triple Junction

The logging programme essentially comprises the standard strings (including FMS). A downhole temperature of 200°C has been predicted on the Northern Transect. The BRGM high-T temperature tool will be run here to determine bottom-hole temperatures before running the Schlumberger string. BHTV is scheduled for the alternative site SC-6. The Motor-driven Core Barrel (MDCB) and Sonic Core Monitor Phase 2 (SCM) will be tested during this leg. The SCM was land-tested last week and worked well. The Pressure Core Barrel (PCB) will be used to sample gas hydrates.

(ii) Gas Hydrates

Gas hydrates are anticipated on Legs 141 and 146. DMP recommended the following logging strategy for characterising gas hydrates. This strategy is based on standard logs.

DMP Recommendation 91/18

"If gas hydrates are encountered, and it is intended to characterise them, logs should be run as soon as possible after an adequate "rat hole" has been drilled beyond the zone of interest, in order to minimize alteration. The logging suite should include the following tools: temperature, pressure, density, neutron, full waveform sonic, gamma ray, dual laterolog, geochemical (capture and inelastic modes), spherically focused, caliper and FMS. The density-neutron tool combination should be run separately from the sonic to enhance data quality."

(iii) Leg 142 - Engineering/East Pacific Rise

The aim is to test the Phase 2 version of the DCS.

(iv) Legs 143 & 144 - Atolls and Guyots

The pre-cruise meeting is scheduled for the week of 28 October 1991. In basement holes the digital BHTV and the Japanese Downhole Magnetometer are scheduled in addition to the standard string. Where there is no basement penetration, only the standard string will be run.

The Chairman referred to DMP Recommendation 91/5 which had proposed one check-shot VSP per leg, to enhance the tie to seismic, and selective deployment of an enhanced geochemical tool for sediment characterisation. It was understood that an enhanced geochemical tool will not be available, but what about the VSP? Golovchenko undertook to raise this matter at the pre-cruise meeting.

[ACTION: GOLOVCHENKO]

(v) Hole 801C - Old Pacific Crust

Although it was recognized that DMP is an advisory and not a thematic panel, Panel members wished to reinforce their earlier position vis-a-vis logging at 801C.

DMP Consensus

Panel reiterates its earlier Recommendation 91/7 to the effect that the previously aborted programme of logging at Hole 801C should be carried out around Legs 143 and 144. Panel notes that this is the oldest oceanic crust encountered in the Pacific, that there are indications that the older crust may be geochemically different from younger crust, and that the basement penetration of less than 150 m is not an impediment to the acquisition of useful physicochemical data. Panel also recognizes that failure to log the hole would constitute a lost scientific opportunity.

DMP Recommendation 91/19

"The supplemental science proposal to log Hole 801C should be upgraded from the status of an alternative site to a scheduled site either as part of Leg 143 or 144 or as a stand-alone subprogramme as proposed."

(vi) Leg 145 - North Pacific Transect

The logging programme comprises the standard suite for all except the shallow holes. BHTV is scheduled for basement sites. The French high-magnetic-resolution sediment magnetometer is scheduled for this leg.

(vii) Leg 146 - Cascadia

This discussion was disadvantaged by the fact that Bobb Carson, one of the Co-chiefs, had had flight problems on his way to the meeting and was unable to attend. Standard logging is scheduled for all holes as is WSTP (6 runs per hole). Three holes (VI-5, OM-3, OM-3A) are targeted for BHTV, VSP, Geoprops (as alternative to the non-functional wireline packer), drillstring packer, and cone plug. VSP is also programmed for Hole VI-2d. Contingency time exists for other downhole measurements, e.g. LAST. The flowmeter tool will be run as part of the packer deployment. It was pointed out that the rotatable packer is no longer on the ship. The straddle packer is intended for cased holes only: a question was raised as to whether this will be improved/modified for uncased holes. Panel had no information on the status of Greg Moore's proposal for funding an extra ship for offset VSP. The Chairman undertook to contact Bobb Carson to clarify.

[ACTION: WORTHINGTON]

(viii) Leg 147 - East Pacific Rise or Hess Deep

The logging plan for Hess Deep should be the same as that already adopted for 504B. In addition to standard logs, BHTV, packer/flowmeter, high-T temperature, dual laterolog and magnetometer/susceptibility should be included in the programme for all sites.

(ix) Fluid Sampling

The Chairman raised the question of a short-term fluid-sampling strategy to be adopted until the Working Group report can be implemented. The favoured strategy was as follows.

(1) Soft rocks: squeeze cores and verify by WSTP and/or Geoprops if available.

(2) Hard rocks: top-hat deployment of Schlumberger or alternative formation testing tool with packer (as opposed to doughnut) sampling module.

12. North Atlantic Prospectus

Golovchenko reported that 11 proposals had been sent out to thematic panels for review. An additional proposal that is not in the prospectus relates to the Cretaceous-Tertiary boundary in the Carribean. The November meeting of PCOM will develop a leg structure for FY 93. It is important to identify logging input before detailed schedules are specified. An initial logging prospectus for the North Atlantic is attached as Annexure IV. The following specific points were noted by the Panel.

(i) Alboran Basin and Atlantic-Mediterranean Gateway

Proposed as a two-leg expedition. Good log-log and core-log correlation needed (via natural gamma and susceptibility).

(ii) Mediterranean Ridge

Detailed programme of downhole measurements, similar to Leg 146 (Cascadia). There is likely to be a high salt concentration in the accretionary prism. Kuznetzov suggested using a Russian 16-transmitter/receiver sonic array stress tool to investigate stress-strain relationships. This tool is being used in deep continental drilling in the Soviet Union. Kuznetzov will send the Chairman a description of the tool for circulation to Panel members so that the proposal can be discussed at the January meeting of DMP.

[ACTION: KUZNETZOV]

(iii) Eastern Equatorial Atlantic Transect

Logging times have been calculated assuming deployment of the side-entry-sub (SES). The LAST tool would contribute to the scientific aims of this leg.

(iv) New Jersey Sea Level

Proposal is concerned with eustatic changes in sea level. Crocker noted that Leg 133 might provide messages concerning the most effective downhole-measurements contribution to the scientific goals, despite the differences between carbonates and clastics. He undertook to evaluate and report back.

[ACTION: CROCKER]

New Jersey Sea Level would require an alternative platform. A feasibility study is to be commissioned by ODP. Panel expressed concern that the feasibility study would not take account of the systemic culture that is being fostered in ODP, namely that drilling, coring and logging are parts of a coupled investigative system and that they contribute interactively to the scientific goals.

DMP Consensus

The feasibility study for alternative platforms should consider logging requirements at the outset. In particular, hole diameter should be maintained.

(v) TAG Hydrothermal Field

Logging programme would be comprehensive. Standard logs would be run assuming that borehole temperatures are less than 150°C. The DCS would be deployed. Panel needs to monitor closely the development of a reaming capability. The high-temperature resistivity tool should be deployed. Some re-entry holes will be drilled and possibly fitted with instrumented seals.

(vi) VICAP Gran Canaria

FMS is essential to the success of the proposal. High-resolution magnetometer/susceptibility logs would be useful.

(vii) Ceara Rise

High-resolution susceptibility tool should be run.

(viii) Mediterranean Sapropel Drilling

No specific drill sites identified as yet.

(ix) North Atlantic-Arctic Gateways

At least a two-leg proposal. Logging-time estimates assume that the SES will be deployed.

(x) North Atlantic Rifted Margins

At least four legs would be needed. The well seismic tool (WST) and LAST should be run. Panel noted that MAXIS will not support the WST.

(xi) Offset Drilling

BHTV is recommended at all four sites: VSP at MK1 and MK2.

The Chairman advised Panel members that the North Atlantic drilling programme would also feature on the agendae of subsequent DMP meetings so that the logging programme might be tuned to the evolving drilling schedule.

13. High Temperature Technology

(i) Temperature/Pressure

The BRGM high-T temperature tool is at LDGO and will be out on Leg 141 (Chile Triple Junction). LDGO now has a 1 km length of high-T cable rated to 350°C and designed to be used with the BRGM tool. This cable will be joined by torpedo to the standard wireline cable. The 350°C cable temperature rating is the upper limit for tool deployment even though the tool itself is rated to 500°C. The tool and cable together with a ceramic cablehead connection will be land-tested in a California geothermal field prior to shipboard deployment.

(ii) Resistivity

LDGO have JOI approval to go ahead with a development contract with the Camborne School of Mines, UK. The tool is scheduled for completion in September/October 1992.

(iii) Borehole Fluid Sampler

Lysne reported on a proposal he had submitted to the US DoE in August for a slimhole (non-leaky) memory tool rated to 400°C. The DoE response was expected shortly.

(iv) Test Facilities

Morin reported that the USGS geothermal operations on the big island of Hawaii had been discontinued due to a blow-out. These wells therefore no longer constituted an option for testing high-temperature tools and cable.

14. Technology Review - Measurement-while-Drilling

Hutchinson reviewed the current status of measurement-while-drilling (MWD) technology for formation evaluation, variously described as formation-evaluation-while-drilling (FEWD) or logging-while-drilling (LWD). MWD was one of the technologies identified in the COSOD II white paper as having a potential future input to ODP.

A downhole MWD system essentially has four components: transmitter, power, memory and sensors. The sensors can include: pressure, temperature, gamma ray, resistivity, neutron porosity, density, photoelectric factor and (acoustic) caliper. There are also directional sensors and sensors near the drill-bit for weight-on-bit and bit torque. Temperature ratings are typically 175°C.

MWD logging systems are essentially memory tools. Therefore MWD records on an equal time basis, not equal depth. The data can be converted to equal depth subsequently.

Comparisons of data from different MWD and wireline companies with core data have furnished generally fair agreement although there are various disparities. MWD precision is lower than wireline precision (e.g. MWD density ± 0.035 g cm^{-3}: wireline density ± 0.02 g cm^{-3}) but when other factors are considered (e.g. invasion conditions, borehole effects) the difference may not be so important.

Future developments include:

(1) pore pressure measurement;
(2) acoustic travel-time sensors;
(3) seismic measurements (VSP/geosteering)
(4) smaller tools (4.75 inches diameter compared to the present 6.75-7 inch collars);
(5) fast two-way transmission

A feature of this scenario might be joint funding to look at generic problems, e.g. caliper measurement and vibration control.

MWD tools could be repackaged into slimhole memory units. However, MWD is unlikely to make an impact on ODP until data can be provided in real time to indicate when drilling targets have been reached. In the meantime ODP will continue to monitor developments through the LDGO membership of the Conoco-led industry MWD consortium.

15. Publicity Brochure

The Chairman reported on discussions he had had with the Public Information Coordinator of ODP-TAMU, Karen Riedel. An ODP initiative, currently in abeyance, has the objective of producing a P.R. brochure on ODP downhole measurements that can be distributed beyond the ODP community, e.g. to industry. The initiative has had the support of the Borehole Research Group of LDGO. There was a feeling in TAMU and LDGO that this might be an appropriate time to pursue the initiative actively so that a brochure could be produced to support the renewal process. However, in order to guide the initiative, certain key questions have to be answered first. These questions are

(i) Why is the publication necessary?

(ii) What would be its goal?

(iii) Who would be the audience?

(iv) What would be its size, scope and demographics?

Panel was invited to evaluate the proposal in these terms.

Panel considered that the most pressing need was to inform and educate the technical community both within and outside ODP. Although considerable effort had been expended by the logging contractor in the form of logging schools, and several key publications had been generated through the Panel's efforts, there was still much progress to be made. This is an important need because the ODP downhole measurements effort is highly professional and there should be general awareness of the ODP's technical capability in this area and of the resulting successes. A clear goal is to promote logging as an integral part of the culture of pure and applied earth science.

Panel identified several technical groups who would benefit from an increased awareness of ODP downhole-measurements capability.

(a) ODP (non-logging) shipboard scientists, who generally do not have succinct information on the rationale behind the downhole-measurements programme.

(b) ODP thematic panel members. Most proposals do not tie the logging capability to the science, merely citing the need for "standard logging". Members of the thematic panels should be in a position to relate logging opportunities to each proposal, e.g. those concerned with offset drilling.

(c) Government scientists. Big government earth science programmes usually have a particular mission. Can we indicate the potential benefits that logging would bring in pursuing their missions?

(d) Scientists in other programmes. We are seeking collaborative ventures with other programmes (e.g. KTB). By demonstrating our skills we might sow the seeds of opportunity.

(e) Scientists and technologists in industry. In some respects ODP logging is leading industry, particularly in the routine deployment of some advanced logging tools. Industry ought to be made aware of this experience and of the opportunities it brings. A particular case is the geothermal industry which only makes limited use of logs.

The size of the brochure should be determined by its scope and structure. Logging should be presented within the context of traditional geological subdisciplines, e.g. geochemistry, sedimentology, etc., as making an important contribution towards solving the contemporary problems of those subdisciplines. There should be one page per subdiscipline, each containing a brief description of the key potential input available from downhole measurements and one graphic illustration of a successful case history. The brochure should begin with a general introduction to the nature and scope of downhole measurements. It should end by relating downhole measurements to other technical areas, e.g. laboratory measurements through the integration of core and log data.

A second need is highlighted by the many requests for information received by BRG of LDGO, e.g. from non-JOIDES institutions, high school teachers, etc. This need requires a brochure couched in lay terminology. Such a brochure would also constitute a useful hand-out to lay visitors during port calls.

It was the overall (but not unanimous) view that one brochure could not satisfy both requirements. Two brochures are needed although there might be some overlap. Draxler reported on the KTB experience. There had already been 170,000 visitors to the KTB site. An outside organisation had produced a public information brochure which they offered for sale to members of the public. KTB recognises the need for a different brochure with a greater scientific emphasis. The KTB experience is that one brochure cannot serve both the lay and scientific communities.

DMP Recommendation 91/20

"A public information brochure on ODP downhole measurements should be produced with the primary goal of educating the technical community. This brochure should draw upon modern graphic-art skills to illustrate vividly the successes of the downhole-measurements programme. There is also a need to inform the lay community. This might be achieved by a separate brochure or preferably by incorporating a downhole-measurements exposition into general ODP public information literature. The latter approach would emphasize logging as an integral part of ODP. The higher priority is the need for technical education."

Panel acknowledged the contribution of Karen Riedel of ODP-TAMU for providing focused briefing notes to facilitate the discussion.

16. Lithosphere Characterisation

The Chairman reported that he had received a letter from Jill Karsten of the University of Hawaii expressing interest in the concept of closely spaced sub-ocean boreholes. It was proposed to defer discussion of the matter to the next DMP meeting. Jill Karsten would be invited as a guest.

17. Shipboard Integration of Core and Log Data

This agenda item was conducted in joint session with the JOIDES Shipboard Measurements Panel (SMP). DMP/SMP met jointly to review progress and prepare an implementation plan for the shipboard integration of core and log data. Both panels agreed that routine shipboard integration of core and log data is a very high priority and that implementation should proceed as a matter of urgency. Based on the trial efforts on Legs 134 and 138, it is clear that the technology exists to achieve shipboard integration of core and log data. In addition, on Leg 138 the scientific party agreed to support one individual among them to work as the core-log data integration specialist. Therefore it is clear that the scientific community is supportive and ready for the proposed integration plan. Both DMP and SMP unanimously support this effort. Moran reviewed the DMP/SMP recommendations from the joint meeting in Townsville in October 1990. A key recommendation was to adopt the merged wireline depth as the reference depth. Thus core data should be matched to log data. This will involve several steps. The Sonic Core Monitor (SCM) will be used to correct core sample depths within the barrel. Points on the core then need to be tied to points on the log, a procedure which is in need of refinement. Also the log depths should be tied to the bottom of the drill pipe.

Previous recommendations have also included the acquisition of a core natural gamma sensing facility and the running of a magnetic susceptibility tool as part of the standard logging suite. The core gamma facility is in hand. The magnetic susceptibility tool has not been acquired, primarily because of financial constraints. Tool resolution should ideally be within the range 3-10 cm, according to the needs of each particular leg. The French high (magnetic) resolution susceptibility tool has a spatial resolution of about 1 m; a new tool with a vertical resolution of a few tens of centimetres should be developed within a few months. Future plans provide for a target resolution of a few millimetres.

The primary goals of this joint session were to refine the basic requirements for effective core-log integration on board ship and to identify steps towards their implementation. Legs 134 and 138 saw the first real attempts to integrate core data in near real time.

Janecek reported on Leg 138. Efforts had been directed at the integration of different core data. There had been no time to consider core-log integration. However, Leg 138 was exceptional in that it was a paleoceanographic leg which set a new record for core recovery (> 99%). A more typical leg would not suffer the same time constraints. The strategy for integrating core data involved two stages, data synthesis and the creation of composite sections. Data synthesis drew upon specific laboratory data (e.g. GRAPE, susceptibility): future data will include natural gamma sensing, colour reflectance and SCM. These data were combined in summary tables as in ASCII format files available to shipboard scientists on the Fileserver.

Composite sections were built on the most complete data section at each site. The first step was the correlation of whole and split core data, involving the depth adjustment of whole cores and of pieces within a core. The creation of composite sections involved merging data from other holes at the site with the most complete section already identified. With this procedure it is necessary to present for each core ODP depths, composite depths, and an explanation/algorithm/shift linking one to the other.

Multisensor track (MST) data were the basis for core depths. They were merged by linear shifting: no data stretch (core expansion) was assumed, even though it was known to exist, because the major problem was to fill the data gaps, not to refine the data at a fine scale. GRAPE, susceptibility and reflectance data were used for developing composite sections. It was assumed that there were no lateral changes between the holes at a site, typically 20 m apart. No generic reference depth was identified. This can be expected to vary from leg to leg, and we need to know how to specify it for different situations.

The next task is to integrate the Sonic Core Monitor (SCM). Thereafter we would be well positioned to move to the next stage of core-log integration.

Janecek was congratulated on a very good effort which had advanced greatly the data-integration cause. Several further points emerged during discussion.

(i) Which hole is to be adopted as the core reference at a multi-hole site? It will be the hole that is logged. This will not necessarily be the hole with the most complete core data at each site, unless there is a change of logging policy.

(ii) How do we handle "excess" core recovery due to expansion? The answer might be to correlate major features with those in the depth-corrected logs and to collapse the core accordingly. We should develop the tools to do this but these tools may not be applicable on all legs.

(iii) We must have a data correlation specialist as a designated member of the shipboard party. This person and their role need to be clearly defined. On paleoceanographic legs, one data correlation specialist may not be sufficient. For example, on Leg 145 (North Pacific Transect) it is proposed to sail one full-time and one half-time data correlation specialist.

(iv) The forthcoming installation of a laboratory natural gamma sensor is primarily targeted at APC whole core, usually obtained over the uppermost 200 m or so of the sedimentary column. Laboratory gamma ray data are intended to facilitate core-log integration. Yet, logs are not usually run through the cased-out uppermost soft sediments (0-75 m) and therefore the degree of potential overlap between core and log gamma data is greatly reduced. Since we are interested in shape matching rather than absolute values of the gamma count, in-casing gamma logs would be useful.

DMP Recommendation 91/21

"In logged holes where the APC has been deployed, the natural gamma log should be run through casing to the surface, to enhance core-log integration."

(v) At multi-hole sites, logging is carried out at the last hole for drilling logistics reasons. In fact, where appropriate, logs should be run in an intermediate hole, to allow additional time for processing. Such a strategy would improve the prospects for core-log integration in real time. Further, the core reference hole, i.e. the hole with the best APC recovery which should ideally be the logged hole, may not be the last one to be drilled. All this points to the need for on-site flexibility concerning which hole is to be logged at multi-hole sites during paleoceanographic legs.

DMP Recommendation 91/22

"At multi-hole (paleoceanographic) sites logging should be carried out in holes other than the last to be drilled, where there are clear scientific benefits to be gained from so doing. The flexibility to effect these decisions should be an integral part of the shipboard culture."

(vi) A core-log integration workstation is already in the ODP budget.

(vii) Data handling on board ship needs to be enhanced generally, not just in the context of core-log integration. An increase in computing power is needed. There is a bigger problem which needs to be recognized.

The Chairman explained that there was now a need to progress the core-log integration initiative further. It is a very important issue indeed; one which could put ODP at the leading edge of technical achievement. The meeting agreed that four key issues needed to be addressed in order to advance the initiative. These were:

Integration Philosophy and Personnel
Equipment
Reference Depth
Data Handling

Syndicate and reporting sessions, directed at examining these key issues, led to the formulation of the following consensus.

DMP Consensus

SHIPBOARD INTEGRATION OF CORE AND LOG DATA

There are four important areas of activity which have to be optimised if the shipboard integration of core and log data is to be progressed. These are Integration Philosophy and Personnel, Equipment, Reference Depth, and Data Handling.

(i) Integration Philosophy and Personnel

Key factors affecting Integration Philosophy and Personnel are Motivation, Correlation Specialist, Approach to Integration, Reporting of Data, and Leg Scenarios

(1) Motivation

The motivation for using the core-log system lies in the recognition of the opportunity provided by the benefits of shared information. Potential impediments are time limitations on board ship and competition among the shipboard party either with each other generally or with the data correlation specialist in particular. Solutions are to make the data available to the shipboard party as soon as possible in formats that are compatible with standard shipboard and homebased hardware (MAC, PC or workstation), and to provide a dataset as a manipulatable product that is transportable. Further, the Co-chiefs will need to be educated so that they can sell the advantages to the scientific party. In particular, the correlation specialist should be promoted as a facilitator.

(2) Correlation Specialist

The correlation specialist serves the scientific party and, as such, should be a member of that party. The position of data correlation specialist should be identified in the shipboard manual and should be filled by the Co-chiefs in the usual way. ODP should offer a training course/workshop in the philosophy and methodology of core-log integration, and potential correlation specialists should attend that course wherever possible. Individual training as appropriate should be provided to nominees by the Science Operator and/or the Logging Contractor.

(3) Approach to Integration

The integration process should be built around key intervals of good data integrity (high core recovery, definitive logs). The rules for sorting these data and making correlation(s) should be codified. Artificial intelligence methodology should be introduced with time. Data smoothing (software) should be applied where appropriate, especially to core data in order to harmonize the different vertical resolutions of core and log measurements.

(4) Reporting of Data

Data should be reported in consistent (SI) units. The reporting process should take account of the bias associated with different measurements. There should be an agreed set of standard definitions and an agreed nomenclature to promote compatibility. Documentation of the above should be produced, especially a glossary of terms and a summary of procedures.

(5) Leg Scenarios

The culture for core-log integration must take account of all the different leg scenarios that might be brought into play. These include paleoceanographic legs, tectonics legs, basement legs (conventional coring) and basement legs (DCS).

To recap, we require a system that will alleviate the shipboard problems of time and competition rather than aggravate them. It must be simple and flexible, easy to use, and capable of demonstrating its value at an early stage of an interactive interpretation exercise.

(ii) Equipment

The following additional equipment was considered necessary to implement the approach outlined above.

(1) Natural gamma ray sensor for core measurement (in place for Leg 145)

(2) Magnetic susceptibility downhole logging tool (required as soon as possible: acquisition date unknown)

(3) Sonic core monitor (Leg 141)

(4) Automation of the physical properties laboratory (March 1993)

(5) Core-log integration workstation (February 1992)

(6) Resistivity imaging equipment (acquisition date unknown)

(iii) Reference Depth

Key factors in developing a reference depth are the need for a Reference Datum, knowledge of the Length of Pipe, defining a Log-to-Pipe Tie-In, establishing a Core-Log Correlation, and the flexibility to handle Other Scenarios.

(1) Reference Datum

A working datum is the rig floor. A more permanent datum is sea level. Therefore we need to measure the height of the rig floor above sea level. This means that we have to measure a reference height which can change during the course of a leg.

(2) Length of Pipe

Errors are possible in counting the lengths of pipe that have been added to the drill string. Modern sensing facilities can do this automatically, e.g. an automated pipe counter. It is known that drillpipe stretches but it should be possible to compensate for this effect by making measurements of the pipe length under tension and using these to calculate total pipe length for any hung vertical deployment.

(3) Log-to-Pipe Tie-In

To do this, we need some signal in the pipe that can be sensed by the gamma ray log, e.g. a weak gamma ray source near the base of the pipe. Thus the pipe and log depths could be correlated when the tool is pulled up into the pipe. It is proposed to introduce the magnetic susceptibility log as a second core-log correlation facility: this tool should respond to drillpipe naturally.

(4) Core - Log Correlation

The approach should be to define a single (composite) trace for each site using the MST data, specifically GRAPE and magnetic susceptibility. Each trace should be smoothed to provide an equivalent resolution to that of the log with which it is to be correlated. Note that different logs have different vertical resolutions. The logs will already have been depth-merged with each other and tied to pipe. The smoothed core data can then be stretched or compressed to match the logs.

(5) Other Scenarios

If logs have not been run, core has to be tied to pipe only. In cases where the pipe is not vertical in the water, pipe depth will depart from true depth. Although pipe verticality can be measured using an inclinometer, it varies with time and it is unlikely that sufficient measurements can be made to characterize verticality meaningfully. Another possibility might be to calculate pipe length through water using one tie-in inclinometer measurement together with data from the dynamic positioning system of the JOIDES Resolution.

(iv) Data Handling

There are three key areas: Data Structure, Software Requirements, and Hardware.

(1) Data Structure

Data need to be input to a data structure. The data structure should accept data in a wide variety of formats including both core and log formats. The database framework is currently being planned at ODP-TAMU. This framework is seen as a longer term goal but we must develop and/or acquire software packages on the assumption that a global framework will exist.

(2) Software Requirements

Software needs can be described in terms of a set of modules each of which has its own specific function. Software modules are required for:

- vertically adjusting two or more data sets so that they match;
- stretching and squeezing to bring two or more data sets to match;
- interpolation of data from sparse data sets to output a regular data set;
- averaging, smoothing and regression to facilitate correlation;
- providing scientists with output data from the data structure in several different formats (scientists leave the ship "with Gigabytes in their pockets");
- generating graphics of various types;
- interrogating the database, e.g. for a particular horizon or technical subject;
- calling in all data that pertain to a particular reference depth.

Although these modules will be discrete, because that makes it easier to organise requirements and to write related software, the scientist will see them as a composite package. Therefore they should be seamless.

(3) Hardware

We must define the hardware that we need to provide the software listed above. The first requirement is for a networked group of workstations on board ship. To choose the hardware we should first clarify what we want to do, see what software is available already, and then select the best hardware option to match the software. In this way we avoid re-inventing the wheel.

The immediate goal is a set of data with a common depth reference. The long-term goal is a complete relational database that would allow, for example, interrogation of eustatic levels and then cross-referencing between wells.

By way of emphasizing the key points from the above consensus, the following recommendation was formulated.

DMP Recommendation 91/23

"The following critical tasks must be addressed for successful core-log integration in interactive mode on board the JOIDES Resolution.

(1) Quantify contemporary methods of depth measurement for drillpipe and wireline.

(2) Refer all depths to the (pipe-tied) gamma log.

(3) Develop interactive graphics for depth matching.

(4) Establish a relational database with an adequate structure and administrative mechanism.

(5) Create the position of Data Correlation Specialist as a member of the scientific party.

(6) Disseminate information throughout the scientific party in a readily transportable mode.

(7) Support the related development work currently taking place at TAMU."

As a lead-in to the above recommendation, the following additional recommendation was formulated.

DMP Recommendation 91/24

"An independent assessment of drillpipe extension and cable stretch should be undertaken conjunctively by LDGO and ODP-TAMU."

18. Panel Membership

The Chairman noted that two US panel members are due to rotate off DMP. They are Karig and Wilkens. Karig will rotate off after this meeting, Wilkens after the January 1992 meeting. In calling for nominations for these two slots, the Chairman noted that the concomitant departure of Stephansson and Karig would leave the Panel weak in the area of in-situ stress, especially as DMP had been denied a TECP Liaison. Wilkens should be replaced by someone with sea-going experience as a logging scientist on the JOIDES Resolution. Several names were proposed, including a stress specialist who had been previously identified by the Panel. In accordance with PCOM policy, the names of the individuals concerned are not minuted. The Chairman undertook to request of PCOM that the stress specialist be appointed to DMP with effect from the January 1992 meeting, as a replacement for Karig. The search to replace Wilkens will continue.

[ACTION: WORTHINGTON]

19. Next DMP Meetings

The next meeting of the JOIDES Downhole Measurements Panel is scheduled for the King Kamehameha Hotel, Kailua-Kona, Hawaii, during the period 28-30 January 1992. Roy Wilkens will host: this will be Wilkens' last panel meeting.

The January meeting will put the Panel back on its schedule of January, May/June and September for its three meetings per year.

The subsequent DMP meeting will be held at the KTB site in Windischeschenbach, FRG, during the period 2-4 June 1992. Hans Draxler will host. The third day of this meeting will comprise a joint session with KTB to further the collaborative efforts between ODP and KTB.

The following DMP meeting will be held in Santa Fe, New Mexico, in late September 1992.

20. Other Business

(i) Downhole Magnetic Susceptibility Tool

Sondergeld noted that a magnetic susceptibility tool would be required extensively in the North Atlantic. Panel needs to progress the initiative soon: it is, after all, a high development priority. The Chairman stated that this would be a major item on the DMP agenda for January 1992. Several options were emerging. LDGO Liaison is asked to report on these at the next DMP meeting. Panel members with potentially useful input are also asked to contribute to that discussion.

[ACTION: GOLOVCHENKO, PANEL]

(ii) Fluid Sampling

Draxler reported on information received from the Bergakademie Freiberg, FRG, concerning an in-situ pore-fluid sampler for use in marine sediments. The tool is similar in some respects to the LAST tool. It has been deployed successfully in the Black Sea. Draxler will obtain a descriptive translation and forward this to the Chairman to facilitate further discussion.

[ACTION: DRAXLER]

(iii) Sonic Waveform Tools

The ODP uses the Schlumberger Long Spacing Sonic (LSS) tool for waveform measurements rather than the Sonic Digital Tool (SDT) which had proved unreliable. Updated versions of the SDT are now available and it may be appropriate to consider switching back to the SDT, which is a technically superior tool. LDGO Liaison will raise this matter at the next meeting with Schlumberger.

[ACTION: GOLOVCHENKO]

(iv) Borehole Gravimetry

Draxler commented on the possible expansion of the logging programme for gas hydrates. The Borehole Gravimeter is a deep sensing tool which might be less affected by any hydrate decomposition around the wellbore due to the drilling process. A commercial gravimeter is available from EDCON who have links with Schlumberger. Should we consider expanding the log measurement suite for gas hydrates?

The Chairman responded that this question was not confined to gas hydrates. Borehole gravimetry had been identified as a possible key technology for the future in the COSOD II white paper on downhole measurements. It would therefore be appropriate for the Panel to hear an expose on this subject, just as they had heard about the state-of-the-art of MWD at this meeting. Sondergeld suggested a possible speaker and offered to make contact: he will advise the Chairman of this speaker's availability for the next DMP meeting as soon as possible.

[ACTION: SONDERGELD]

(v) ONDO Experiment

Yamano reported that a dive to Site 808 undertaken in July could only reach Hole 808D where the casing was seen to have failed. ONDO is in Hole 808E. Attempts to communicate with ONDO across the sea floor were unsuccessful. Therefore no data were recovered.

Yamano reported a safety issue in connection with re-entry Hole 808D. The pilot of the submersible had expressed concern about three buoyant spheres connected by wire to the re-entry cone of 808D. These were seen as potentially dangerous to the submersible. Golovchenko explained that the spheres are intended to facilitate the location of the re-entry cone by camera during a re-visit by a ship. In sediment, there is a possibility that some of the cone might become partly concealed.

Panel noted the distinction between shipborne re-entry and access by submersible. In the latter case a protruding vertical wire could constitute a safety threat.

DMP Recommendation 91/25

"Where buoyant spheres have been wired to a re-entry cone, this installation should be recorded and notified to organisations who have indicated that a submersible is to visit that hole."

(vi) Soviet Expertise

Kuznetzov conveyed greetings to the Panel from the geophysical community in the Soviet Union. He emphasized technical skills, especially in the nuclear and acoustics areas, that had been deployed at Kola. Kuznetzov suggested that he make a presentation on downhole measurements activity in the Soviet Union because this might afford opportunities for ODP.

The Chairman agreed that such a presentation should be made at the next DMP meeting. The agenda for the January meeting would include reports by National Representatives.

21. Close of Meeting

The Chairman thanked Panel Members, Liaisons and Guests for their contribution to the meeting, the Director of the Atlantic Geoscience Centre of the Geological Survey of Canada for the kind hospitality and the provision of meeting facilities, and Kate Moran for her gracious hosting. The meeting closed at 1610 hours on Thursday 17 October 1991.

PAUL F WORTHINGTON
21 October 1991

000098

REPORT ON MEETING OF JOIDES TECHNOLOGY AND ENGINEERING DEVELOPMENT COMMITTEE

Victoria BC
Canada

11 - 12 September 1991

1. **Preamble**

This meeting of JOIDES TEDCOM was attended in two capacities, as liaison from JOIDES DMP and as stand-in UK representative. A key feature of the meeting was to review progress with the Diamond Coring System (DCS).

2. **Operations Summary, Legs 134 - 139**

Storms (ODP/TAMU) reported, inter alia, the following highlights.

Leg 134: low core recovery in Hole 831B (12-70%); scientific objectives were met through the logging programme.

Leg 135: the Motor-Driven Core Barrel (MDCB) was re-tested in Holes 834A and 839B and cored sediment and basalt. A major design change re bit loading was suggested. This has been done and the MDCB will be subjected to sea trials on Leg 141.

Leg 136: a re-entry cone seal (CORK) was successfully deployed as an engineering test of the concept. Two corks were subsequently installed during Leg 139.

Leg 137: Hole 504B was cleared of junk and deepened to 1571 mbsf. RCB coring was resumed and a conventional oilfield core barrel was used to deepen the hole further (1611 mbsf). The uppermost stabilizer failed and left 18m of core barrel in the hole. This is to be fished during the next leg (140) after which further hole deepening will be attempted.

Leg 138: record number of holes cored (42) with 5536.8m recovered (99.9% recovery), also an ODP record. Holes were mostly shallow for palaeoceanographic purposes and were cored using APC with some XCB deployment.

Leg 139: 22 holes drilled at 4 sites. Pressure coring system was used for the first time in operational mode. Two sites were set with re-entry cones and sealed (corked). Overall core recovery was quite low. H_2S was not a problem. Hole cooling was very effective: 300°C bottom hole temperature was cooled to 43°C in one case.

3. **DCS Phase II Status**

Leon Holloway (ODP/TAMU) reported two significant milestones concerning tests of the upgraded shock-absorbing safety system. Two series of qualification tests have been completed, "drop" tests and "slingshot" tests. Data reduction and analysis are still in process, but the indications are that the tests will satisfy SEDCO concerns.

000100 The secondary heave compensator should be assembled before the end of September; this will be tested during October. At the end of October the rig will be dismantled prior to shipment to Valparaiso for testing during Leg 142.

DCS seafloor hardware was reviewed. In general the modified system should be easier to deploy than that used during Leg 132.

4. **Engineering Leg 142 Status**

Leg 142 encompasses the third shipboard test of the DCS. The primary engineering goal is to maximise the amount of coring time available. A minimum penetration of 100m bsf with 50% minimum recovery is sought. To accomplish this task, a new 3-leg/hexagonal hard-rock guidebase will have to be set. Plans are to test the deployment of slimhole temperature/gamma ray/caliper tools from the platform into the 3.96" DCS hole. Then reaming out to a 7.25" hole through the "rubble" zone will be tried. If stable, and time permits, standard temperature/gamma ray/caliper tools will be run for comparison with the slimhole logs. If unstable, the upper "rubbly" section could be isolated behind the second stage drill-in BHA. DCS coring could then be resumed.

There was some discussion of this programme. One view was to continue coring in the primary hole and regard all other experiments as secondary to the goal of gaining drilling experience with the DCS. The secondary objectives should only be attempted if coring has to stop, eg through high temperatures. Alternatively, a second guidebase could be set to drill another hole. The degree of success on Leg 142 will influence whether the ship returns to EPR. The programme of tests must be designed to maximise the chances of success.

5. **DCS Phase 3 Status**

Current platform design is intermediate to allow the DCS concept to be proven, especially as regards secondary heave compensation. It has been recognised that in the long term a more efficient and safer system would have to be designed. The Phase 3 system is aimed at bringing operators back down to the rig floor. Two designs have been proposed, a bottom-mounted slip joint and a riser-tensioner system. Both of these have the potential to eliminate the raised platform. Feasibility studies have been commissioned on both. Final reports are awaited.

6. **Deep Drilling Studies by TAMU**

Gene Pollard described plans for drilling to 2km at Hole 504B. Deep drilling normally requires contingency casing strings which greatly increase the drilling time. It could take 100 days to drill to 2km; this would require two legs. Deeper holes to 3km would be more achievable with 200-300m of sediments, a water depth less than 3500m, a low temperature gradient, featureless topography, and low currents (< 2 knots). Recovery in pillow basalts is typically 10-15%: there is nothing available in industry that would improve this figure with a rotary coring system. At greater depths, in gabbros, where fractures are less of a problem, higher rates should be achievable. Slimhole systems would provide higher recovery rates throughout, but the DCS is not being considered as a solution to the deep drilling problem at this stage.

7. **Offset Drilling WG**

Eldridge Moores reported on the WG's primary goal, to examine the nature of the major ocean basins. There were many possible "type" sites of oceanic crust. Fast spreading sites include Hess Deep and Discovery Deep. Slow spreading centres include the Atlantis II Fracture Zone in the Western Indian Ocean. Major objectives are the Layer 2/3 boundary, long sections of Layer 3 and the Layer 3/4 boundary (the Moho).

8. **North Atlantic Rifted Margins DPG**

The North Atlantic is a type locality for studying the rift and drift history of conjugate margins. Sites were identified in volcanic-prone and non-volcanic-prone margins. The former typically has < 3km water, < 1km sediment, 1-2km basement. An example of the latter is site NB-3 with c.4km water, 2.5km sediment and limited basement penetration (100-200m). This will push the capability of the JOIDES Resolution.

9. **Deep Drilling - Thematic Needs**

It had been previously decided that TEDCOM could not ask TAMU to progress the issue of deep drilling without some indication of the characteristics of typical sites that ODP would expect to encounter. Three thematic panels were asked to provide this input: TECP, LITHP, SGPP.

TECP proposed two sites at rifted margins and two at convergent plate margins. For example, site NB-3 (Newfoundland Basin, North Atlantic) is a rifted-margin site with projected 3800m water depth, 2060m of clay, 200m of sandstone and 200m basement penetration, giving a total predicted depth of over 6200m. The other (Atlantic) rifted margin site is G-14. Convergent margin site proposals are DAP-1, in the Pacific, and DAP-2 at Barbados. The stress regimes in convergent margins could create drilling problems. Borehole televiewer (BHTV) logs would be required for stress determinations. NB-3 would be the highest priority.

LITHP described a generic ocean crust site with 6km of water and 4km of penetration, giving a total drillpipe length of 10km. This would exceed the operating limits of the Resolution. There would be 0-300m of sediments. The basement succession would comprise 1km pillow basalts, 1km sheeted dykes, 3km gabbros, 1km dunite/peridotite. Temperature would depend on age. Potential drilling problems include brittle crust in the upper sections and lost circulation in highly fractured zones.

SGPP nominated a site in the Western Somali Basin that is the subject of a current drilling proposal. Water depth is about 4900m with 1500m of sediment. Total depth would be 6.5-7.0km. This would extend the Resolution to its operating limit.

The next stage is to commission a detailed feasibility study that draws on outside expertise and is managed by ODP/TAMU. There is a need to pull in the expertise of the oil industry (Petrobras, Shell, Exxon). The task is a big one and should not be underestimated. External consultant(s) should be selected with the involvement of TEDCOM. A request for proposals, based on the thematic panel expositions, should be prepared by ODP/TAMU, approved by a TEDCOM subcommittee, and distributed to the community. Proponents should present their proposals to TEDCOM before one or more is selected for the feasibility study.

10. **Next Meeting**

TEDCOM is to increase the frequency of its meetings in order to become more effective. The next meeting is scheduled for April 1992.

Paul F Worthington
16 September 1991

000102

ANNEXURE II

000103

FEASIBILITY OF CONTINUED DEVELOPMENT OF THE GEOPROPS PROBE

Scott McGrath
Ocean Drilling Program
Texas A&M University

16 September 1991

000104

CONTENTS

1. TOOL DESCRIPTION/OVERVIEW

The Geoprops Probe is a 3 1/2" O.D. 24' long straddle packer device developed by TAM International under the direction of Dr. Dan Karig of Cornell University. The tool is intended to be deployed into a pilot hole made by the Motor Driven Pilot Barrel (MDCB). Once in place, the tool is actuated by pump pressure at the surface. Embedded in the packer elements are temperature and pressure measuring devices and fluid sampling ports. Upon inflation of the packer elements the temperature and pressure measuring devices as well as the fluid sampling port are placed in direct contact with the borehole wall. The formation temperature and pressure are measured every 15 seconds and the data is stored in an integral memory unit. The formation fluid flows through three segregated sample bottles to aid in determining the contamination of the fluid.

The Geoprops probe can also pulse the formation between the packer elements and record the pressure decay versus time to determine a formation permeability. Once back on deck, the integral memory unit can be downloaded into a PC via an RS-232 cable for evaluation of the 5 pressure and 2 temperature sensor measurements. The fluid samples can also be removed under pressure.

The landing mechanism for the Geoprops Probe was developed by ODP/TAMU's Engineering group. The landing mechanism serves three functions. First it provides the choke point creating a pressure seal to operate the tool. Second, it provides a landing shoulder which prevents the tool from completely existing the BHA and provides a control point from which the probe is spaced out. Finally, the landing mechanism provides a means of attaching the wireline for retrieval. Standard ODP/TAMU wireline tools are used to retrieve the tool.

2. BACKGROUND

The Geoprops Probe production plan was originally scheduled to allow for deployment of the tool on ODP Leg 131 (March 1990) but this plan was thwarted by production delays. Two tools were completed, however, by August of 1990. Two different "land" tests were then conducted on the tool.

The first land test occurred on December 11, 1990 at the Ocean Drilling Program test facility at Texas A&M University, Riverside Campus, College Station, Texas. The test was intended to check the sequence of mechanical functions of the probe under simulated operating conditions. The specific details of this test can be found in reports by Tom Pettigrew of ODP/TAMU and Dan Karig of Cornell University. Briefly, the recommendations that followed included:

1) Further "bench test" the tool to closely examine the operation of the slug valve and to "calibrate" the packer pressure response to the slug pressure pulse. (The packers are compressible and will expand into the interval area during a slug test. This volume change affects the recorded interval pressure and must be accounted for to correct the downhole data for equipment effects.)

2) The shear pins used in the tool must be calibrated in the valves because of the effect of the seats on the shear strength of the pins.

The second test was a "bench test" of the tool on June 26, 1991 at TAM International in Houston, Texas. The objectives of this test were to test the reliability of the slug valve regulator and determine the volume change in the interval due to reduction of interval pressure during the slug test. These were the main recommendations which followed the first test as mentioned above. The results of the bench test are detailed in reports by Dan Karig of Cornell University and Dave Huey of ODP/TAMU. Briefly, the recommendations that followed were:

1) Re-design the slug valve to prevent overtravel of the shuttle which is causing an o-ring failure.

2) Mill o-ring grooves in upper end of sample bottles so that pressure can be applied to empty the contents of sample bottles under pressure.

3) Refine practical method for setting/adjusting the shear pin and spring settings.

Upon completion of items 1 & 2 listed above, TAM International felt that they had fulfilled their contractual obligations and requested that ODP/TAMU, Dan Karig or some other principal party takeover tool development. **It should be noted that in addition to the three recommendations listed above, ODP/TAMU engineers in attendance at the bench test felt that the following additional steps were essential for ODP/TAMU acceptance of the tool:**

1) Bench test BOTH tools.

2) Include ALL functions in bench tests (slug tests, fluid samples, filter blockage tests, temperature measurements)

3) Test packer volume change into slug interval for BOTH packers.

4) Determine reliability of packer inflate check valve.

5) Investigate and confirm shock tolerance.

6) Compile a complete set of accurate final drawings.

7) Complete a bill of materials.

8) Complete a list of spare/consumable parts

9) Consider design upgrades such as enclosing the exposed wiring junctions and sample bottle sections in a pressure case.

The Geoprops Probe at this point had shown significant promise and most parties involved with the tool thought that it could ultimately be made to work. The judgement of the engineering staff at ODP/TAMU was that the tool needed to go through the steps outlined in the recommendations that followed the bench test of June 26th. According to ODP/TAMU's guidelines for Third Party Tool Development (JOIDES Journal, XVII,1,56-57 - See Attachment A.) the tool was not ready for acceptance by the DMP. At this point, the principal investigator, Dan Karig, felt that he had fulfilled his obligation to the project and that the scientific objectives of the tool had been met. The Geoprops Probe is at a point where it needs a principal investigator to see it through to completion along with the funds that this final stage would require.

Presently, there exists strong scientific interest in having the tool fully operational for Leg 146 (Cascadia). There has been significant discussion as to how the tool might be brought to a successful conclusion, resulting in a "Mature ODP Tool" that will be acceptable by both the DMP and ODP/TAMU. One option discussed was for the engineering staff at ODP-TAMU to take over development of the tool. At it's April 1991 meeting, PCOM prioritized the projects on which the engineering development effort should be spent. The bottom priority was development of the "MDCB, in preparation for the use of Geoprops in the Cascadia drilling." For the Geoprops Probe to be deployed on Leg 146, it would almost certainly need to go through trial runs on Leg 143 or 144.

3. <u>PURPOSE</u>

With this lengthy background in mind, this report will analyze the feasibility of ODP/TAMU's engineering staff assuming "continuation of development" of the Geoprops Probe to a mature state. If it is feasible then the question of external funding for the project still exists. ODP/TAMU may or may not add the Geoprops to it's current list of projects even if sufficient funds for the project are identified and allocated. ODP/TAMU also feels that a scientist should be involved with the final development of the tool to assure that the data gathered meets the scientific criteria. The decision to takeover the tool will be made by PCOM and DMP on the basis of this report, scientific interest, scheduling, and funding.

4. TOOL OPERATION AND DATA ACQUISITION

In order to understand the specific parts or sections of the tool which need to be modified for ODP/TAMU acceptance a description of how the tool operates is presented here. The material in this section is referenced from the small Geoprops Probe manual written by TAM.

The Geoprops probe is designed to be run in the pilot hole left after the MDCB coring bit is retrieved. The tool is dropped into the drill pipe at the surface, falls and lands at the core barrel latch with the majority of the probe protruding out the end of the drill pipe into the pilot hole.

The probe functions are controlled by drilling fluid pressure. Shear pin valves and spring loaded regulators control the packers and the slug tests pressures. Pressures presented to the probe are the result of differential pressure across jets in the top of the tool and pump flow rates controlled from the surface.

4.1 Valve control

After the probe is seated, surface pressure is applied to the probe to shear the pin that controls the packer inflate valve. When the packers have reached a specific pressure, the sample control valve pin will shear and the sample bottles will be opened to the sample ports in the packer walls. The bottles are plumbed sequentially such that after each bottle is filled, the sample fluid is directed to the next bottle.

After the packers are set, the pressure applied to the probe is raised sufficiently to shear the slug start valve pin, permitting fluid to flow to the slug regulator valve. Any pressure applied to the probe is then applied to the interval between the packers. The slug regulator valve will close off the interval when the applied pressure exceeds the annulus pressure by a preset amount. The valve will remain closed as long as the applied pressure exceeds the preselected pressure setting of the valve.

Packer deflation can be controlled by two possible methods. The normal deflations is by a shear pin controlled valve. When the pressure applied to the probe exceeds the pressure required to shear the deflate valve shear pin, the valve closes off any flow to the packers and vents the packers to the annulus. The second action occurs if the probe is pulled away from the packers. A port in the quick disconnect is opened to the annulus, relieving packer pressure. A weak link is built into the top of the packers which can be pulled in two if the packers will not follow probe motion.

4.2 Data Acquisition

The packers contain ports and transducers to gather data and fluid samples from the pilot hole wall (Fig.1). Filtered ports are connected to the sample bottle system and to pressure transducers. Once packer pressure opens the sample valve, fluid can flow to the sample bottles at 87% of the annular pressure. If the packer pressure decreases sufficiently to permit the packers to separate from the pilot hole wall, the sample valve will close and stop the sampling process.

Each bottle has a mechanically actuated valve that opens when the bottle is full and the piston in that bottle bottoms out. When the valve actuates, the sample fluid is directed to the next bottle, thus sequentially filling each sample bottle (Fig. 2).

Each packer has a pressure port that is sealed against the pilot hole wall when the packer is inflated. An Interval Pressure port is also mounted in the interval between the packers. Packer Pressure is measured at the packer dump valve and Annular Pressure is sampled at the bottom of the electronics section. The corresponding pressures are transmitted to pressure transducers mounted in the electronics section.

Each packer has a temperature transducer that is pressed against the pilot hole wall when the packer inflates. The transducer is a thermistor potted in a copper cup with epoxy. The thermistor is in thermal contact with the copper face which is in contact with the pilot hole wall.

4.3 Electronics

The electronics section amplifies the signals from the transducers, digitize's them, and then stores the results in solid state, non-volatile memory (Fig. 3). The electronics is battery powered and supplies the excitation to the pressure transducers (Fig. 4). After tool retrieval, the stored data is transmitted to the interface via an interconnecting cable.

4.4 Interface

The interface is a buffer between the probe and any computer that can communicate on an RS-232 serial port. The computer must be able to issue and receive ASCII characters. The computer is used to clear the probe RAM memory before the run and receive the data after the run. The interface powers the probe during these exercises (Fig. 5).

5. COST ANALYSIS

In order to make the Geoprops Probe fully operational some basic costs will be incurred. The costs include such items as spare parts, shipping containers, fluid sample transfer unit, etc., along with all of the recommendations made after the last bench test. The Geoprops Probe can be made operational with some minor design changes and further testing. However, some basic design flaws exist in the tool that may cause problems over time. Several examples are, the sample bottle chamber which is open to the annulus and not pressure sealed, the rubber wrapping around the external tubing, and the pin connectors that do not seat within the bulkhead. The cost analysis is based on a concept of Phase 1 and Phase 2 deployment scheme. Phase 1 will take the existing tool and just make it functional. Phase 2 will include the additional costs of engineering design changes necessary to make the Probe a standard ODP deployable tool. The goals For Phase 2 will be to make the tool less maintenance intensive, non-corrosive, serviceable, and reliable. ODP/TAMU will not be able to accept long term responsibility for Geoprops as a "Mature ODP Tool" until completion of Phase 2.

5.1 PHASE 1

The following items are necessary for initial acceptance of the Geoprops Probe:

1. **ADDITIONAL BENCH TESTS**
2. **PACKER VOLUME CHANGE**
3. **PORE FLUID SAMPLE TRANSFER UNIT**
4. **COMPLETE SET OF FINAL DRAWINGS**
5. **CALIBRATION SYSTEM**
6. **ELECTRONICS SECTION/SHOCK TOLERANCE**
7. **SPARE/EXPENDABLE PARTS**
8. **PROTECTIVE RUBBER BOOTS**
9. **OPERATING/MAINTENANCE MANUAL**
10. **SHIPPING/STORAGE CONTAINERS**
11. **CONSULTANT ENGINEER (NON-ODP/TAMU)**

1. ADDITIONAL BENCH TESTS

A bench test that includes ALL functions of the tool must be done. Some parties formerly involved with the Geoprops Probe felt that some tool functions could only be tested by deploying the tool at sea. The only limiting factor at any bench test is cost. Every function of the tool needs to be tested if the cost to setup such a test is reasonable.

2. PACKER VOLUME CHANGE

To obtain accurate interval pressure data during a slug test the packer volume change effects must be determined. Dr. Dan Karig, Professor of Geology at Cornell University did some work in that area during the bench test at TAM. The results of the tests can be found in a report by Dr. Karig dated 6/26/91. Basically a pressure differential at which leakage occurs between the packers and the interval was established. However, the packer volume change in the interval was not recorded using calibrated gauges and the gauges also lacked the proper resolution for such a test. The test should be repeated with better gauges while varying the packer pressure and holding the interval pressure constant and again with the packer pressure held constant and varying the interval pressure. BOTH sets of packers need to be tested and a relationship established.

3. PORE FLUID SAMPLE TRANSFER UNIT

The three sample bottles each have a check valve on one end. To empty the bottles a valve control tool is attached to the check valve and an external pressure is applied to the outlet of the valve control tool equal to the pressure of the bottle. The handle of the valve control is then turned in to open the check valve. Each sample bottle has 4 external vent holes, 3 of which can be plugged off and pressure applied to the fourth to expel the fluid sample. A comparable fluid transfer unit has been built for the Wireline Packer and this method can be copied. Parts needed include: high pressure valve control, high pressure hose, plugs, pump, and transfer bottles. A system to remove and transfer a fluid sample is much easier and cheaper than a system to remove a sample under pressure. If a sample under pressure is desired then the cost of the pressurized sample transfer bottle must be taken into account.

4. COMPLETE SET OF FINAL DRAWINGS

The Geoprops Probe is a third party tool developed by TAM International. TAM is claiming proprietary status on the detailed part drawings of the tool. TAM has released some basic layouts and schematics but they aren't sufficient for routine operations and maintenance. The alternatives are to be tied to TAM for ANY detail work that needs to be done on/for the tool, generate our own drawings, or get cooperation from TAM to provide at least enough detail for ODP to operate the tool from the ship.

5. CALIBRATION SYSTEM

A calibration system for the shear pins and spring valves must be developed. A small volume, high pressure pump attached to the top of the tool through an adapter would provide the necessary pressure. The packer sleeve used during the bench test has ports to monitor the pressure along the axis of the tool and could be used for calibration purposes. Additional parts required would be pressure gauges and hoses.

6. ELECTRONICS SECTION/SHOCK TOLERANCE

The Geoprops Probe needs to withstand a 40 g shock if it is to be deployed by free-falling through the drill pipe. The main part of the tool that appears to be susceptible to a great shock is the electronic section. No apparent shock absorption system of any kind is built into this area (Fig. 6). A padding, spring system or combination would certainly help cushion the electronics. A shock tolerance of the entire tool must be done before the assembly is declared acceptable.

7. SPARE/EXPENDABLE PARTS

Spare parts include Thermistors, Pressure Transducers, O-Rings, shear pins, fluid sampling port screens, backup packer assemblies, entire lower packer assembly (if pulled off) and a flushing agent to clean the tool. TAM recommends using antifreeze to flush the tool. The two straddle packers are made from a wire mesh covered by a rubber element. The rubber is subject to wear and will crack, tear and deteriorate with repeated usage. One packer element on one of the existing tools has developed a crack just above the fluid sampling ports due to age (2 yrs) and simple bench testing (Fig 7.) (Although TAM International claims that the crack is only in the outer shell and does not affect packer integrity). The separate elements can be replaced as necessary. If the packer assembly becomes stuck in the hole even after deflating, then a safety joint at the top of the packers can be pulled in two, leaving the packers in the hole. Therefore, a backup packer section would be necessary.

8. PROTECTIVE RUBBER BOOTS

The wires that run to the temperature thermistors on the packer assembly are routed through 1/8" tubing conduits on the outside of the tool. These tubing conduits are currently held in place by wrapping rubber bandaging around the tubing (Fig. 8). This occurs in between the packer elements and above the top element. Although this is a CHEAP means of clamping the tubing to the tool to prevent inadvertent hang-ups it by no means is acceptable by ODP/TAMU standards. The bandaging needs to be removed and replaced with a sturdy rubber boot to cover the exposed areas.

9. OPERATING/MAINTENANCE MANUAL

TAM International has furnished a brief instruction manual for the tool. The manual will have to be expanded to include: a routine calibration of the shear pin and spring valve settings, tool preparation, tool running procedure, data gathering techniques (fluid, pressure & temp data), tool maintenance, ODP/TAMU associated equipment, circuit diagrams, hydraulic diagrams, tool diagrams, and scientific operations such as software modifications to vary parameters according to various operating conditions.

10. SHIPPING/STORAGE CONTAINERS

Two complete sets of shipping containers will be needed to house the tools and the auxiliary equipment. The containers can be wooden boxes with a foam padding and a fiberglass liner on the outside.

11. CONSULTANT ENGINEER

ODP/TAMU has worked with consultant engineers in the past on engineering intensive tools (i.e. Pressure Core Sampler). If it is decided to continue development on the Geoprops Probe and if the time frame for deployment of the tool is quite short then a consultant engineer may be considered. The cost would be quite high but would be justified by satisfying all the requirements to make the Geoprops Probe a "Mature ODP Tool".

5.2 <u>PHASE 2</u>

Phase 2 will consider the additional engineering changes envisioned at this point in time to make the tool more robust and reliable as per standard ODP/TAMU downhole tools. This involves ensuring non-corrosive materials are used where necessary, shock tolerances are passed, tool is maintainable, repeatability is good, and the tool is basically reliable. The list will undoubtedly grow larger as the tool is developed and tested further.

The following list provides some of the engineering changes envisioned at this point in time to improve the tool:

1. **NON-CORROSIVE MATERIALS**
2. **SUPPORT SYSTEM**
3. **BULKHEAD CONNECTORS FOR PINS**
4. **PRESSURE CASES**
5. **HIGH COST REPLACEMENT PARTS**

1. NON-CORROSIVE MATERIALS

The sample bottle section of the tool is open to the annulus and allowed to flood with borehole fluids. This is necessary for the valves to equalize with hydrostatic pressure. The valves then operate by applying additional pressure (differential) from the surface. If the tool is designed to be open to borehole fluids then it should also be designed with non-corrosive parts in the same area. This may not be a problem if extreme diligence is applied to the cleaning and flushing of the tool after each run. Stainless steel is relatively inexpensive and can be used throughout this area.

2. SUPPORT SYSTEM

It is essential that the shear pins and spring valves be tested and set prior to each run in the hole. To access the valves in the sample bottle section, the internal section which rides on a "support bar" must be pulled from the external housing. When the sample bottle section is removed from the housing it becomes readily apparent that the support bar is giving minimal support. In addition the check valve which prevents over inflation of the packers is "force-fitted" into the bottom of the section (Fig.9). A better support system should be developed to allow easy removal of the sample section while lending support at the same time.

3. BULKHEAD CONNECTORS FOR PINS

The bulkhead connection between the packer section and the sample bottle section has four pin connections with rubber boots and insulators. There is some inherent slack in the wires for ease of assembly (Fig. 10). While that may ease assembly, the reliability of a connection that is allowed to move is questionable. A permanent, self-aligning bulkhead pin connection would ensure positive makeup of the pins while lending support at the same time. This is typical of the design on the Geoprops Probe where a function or connection can be made to work ONE time, but with no reliability during repeated use.

4. PRESSURE CASES

An alternative to converting all materials to stainless would be to enclose the tool in pressure cases. This is not uncommon, and in fact all downhole tools manufactured by wireline logging companies employ this technique to protect the tool. The tool is designed to allow the hydrostatic pressure to enter the valves and this would have to be changed. The electronics section of the Geoprops Probe is enclosed in a pressure case however. The addition of pressure cases to protect the tool from the environment would require a total redesign of the tool's structural framework.

5. HIGH COST REPLACEMENTS

The packer elements will need replacing due to wear and degradation over time. the cost to replace one inflation element on the straddle packer is formidable but needs to be taken into consideration ($6488.00). The cost to replace the lower straddle packer section of the tool, should the packer section get left in the hole, will be **$20,644.00**. With the redundancy of two tools on the ship, neither one of the parts will have to be maintained in inventory. Eventually, if the tool is developed these costs will come into consideration.

A detailed cost analysis of Phase 1 and Phase 2 is attached.

Third Party Tool Development

Introduction

Because of the complexity of downhole measurements required by scientific ocean drilling, ODP has historically relied in part on outside (i.e., "third party") development of various borehole devices. Some examples are the drillstring saddle packer, the Lateral Stress Tool (LAST), GEOPROPS (for measuring *in situ* physical properties), and the borehole seal. Support for such development comes from a variety of sources. In the U.S., third party tool development has generally been supported by the National Science Foundation, using funds earmarked for ODP and allocated to highly ranked, unsolicited proposals.

Because these tools must eventually make the transition from a developmental stage to actual deployment downhole, which puts them under the management and operation auspices either of the Borehole Research Group at LDGO (for wireline devices) or of ODP-TAMU (for all others), PCOM authorized DMP in 1988 to develop a set of guidelines for the overall process of monitoring third party tool development. The goal is to improve communications between cognizant management entities within ODP and outside investigators/agencies with interests in downhole measurements.

DMP completed its guidelines in January 1989, and PCOM approved those guidelines in May 1989. At DMP's request, and with the approval of the PCOM chair, those guidelines are reproduced here so that both their existence and general applicability will be clear to all concerned parties.

Guidelines for the Monitoring of Third Party Tools

There are two types of third party tools: Development Tools (instruments under development) and Mature Tools (established tools).

A.) For a tool to be considered an ODP Development Tool, and thereby scheduled for deployment, several criteria should be satisfied.

(a) There must be an identified principal investigator.

(b) LDGO (for wireline tools) or TAMU (for all others) should formulate a development plan in conjunction with the principal investigator, and then inform DMP of this plan.

(c) The development plan should:

- indicate the acceptance, desirability, financial and technical feasibility, and the usefulness of the measurements;
- identify development milestones;
- make provision for initial testing on land;
- satisfy safety considerations;
- specify shipboard requirements such as the data processing necessary to make the information accessible on board ship, any special facilities (emphasising areas where the tool is not compatible with existing hardware/software), and appropriate technical support;
- contain a statement of intent that the tool would be available for post-development deployment in ODP.

If DMP endorse the development plan, and subject to PCOM approval, the Panel will appoint a coordinator to monitor on behalf of the Panel the tool's progress through the development plan. The Panel monitor will receive reports from the Principal Investigator on request and will present these to DMP. DMP will review progress at regular intervals and will evaluate tool performance after each deployment. Day-to-day monitoring will be the responsibility of TAMU and LDGO. A tool cannot be regarded as an ODP Development Tool, and therefore cannot be scheduled for future legs, if it has not undergone the above procedure. All tools that are currently scheduled must have a development plan formulated as soon as possible. Once a tool has been accepted by DMP as a Development Tool, the Principal Investigator will be required to co-sign the development plan with TAMU or LDGO as appropriate as a visible accedence to the provisions of the plan. A Development Tool cannot be deployed on an ODP leg unless TAMU/LDGO and DMP are fully satisfied that the terms of the development plan have been fully met.

B.) For an ODP Development Tool to undergo the transition to an ODP Mature Tool, i.e. an established tool operated by TAMU or LDGO, there must be DMP endorsement. This endorsement will be given after Panel review of a proposal prepared by TAMU and/or LDGO and submitted to DMP. This proposal must satisfy DMP on the following counts:

- cost of routine operations including shipboard data processing;

- requirements for routine operations/processing;

- availability of spare components;

- facilities for maintenance;

- existence of an operating/maintenance manual;

- safety considerations;

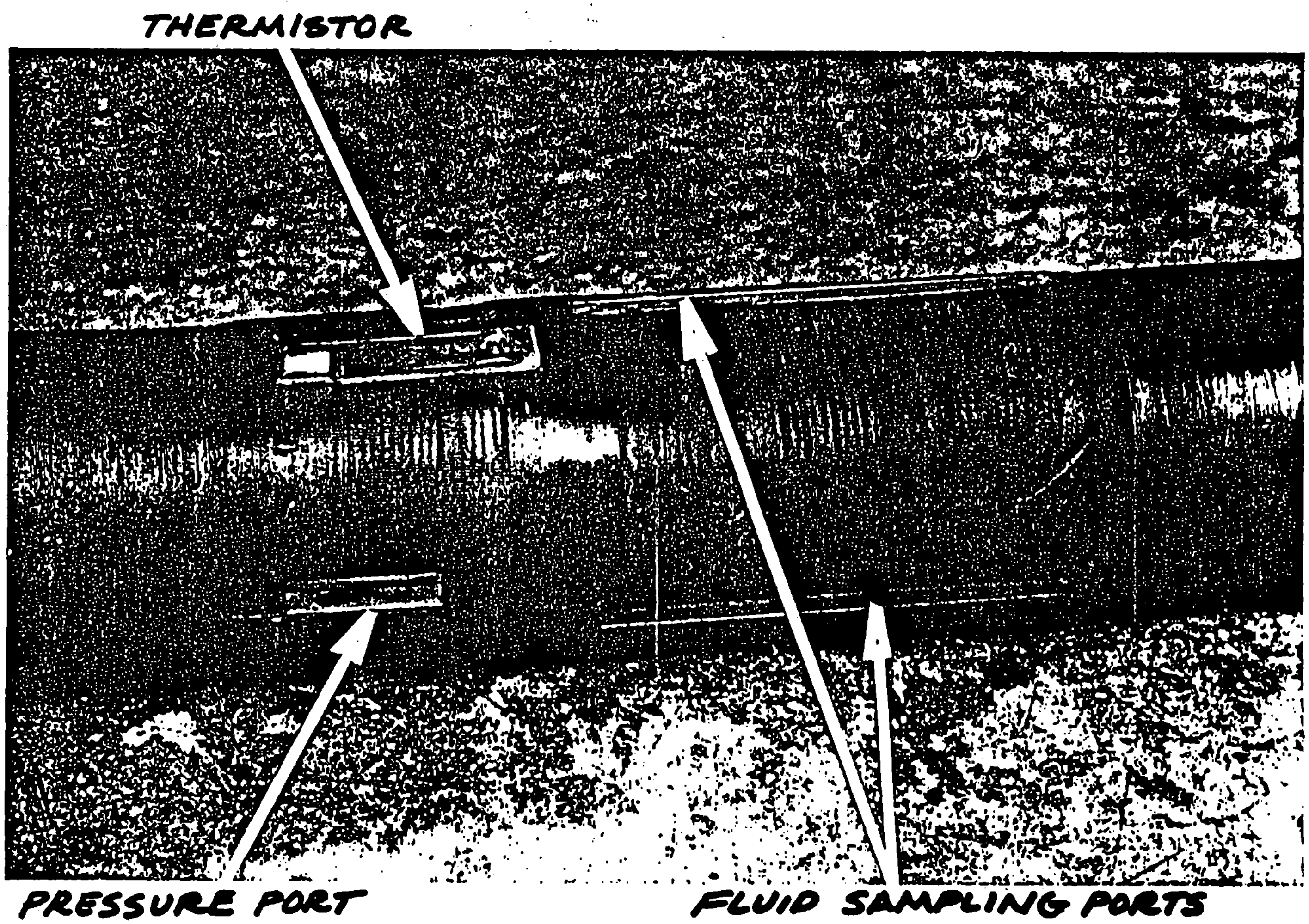
- long-term usefulness of data;

- established track record both in land tests and shipboard deployment.

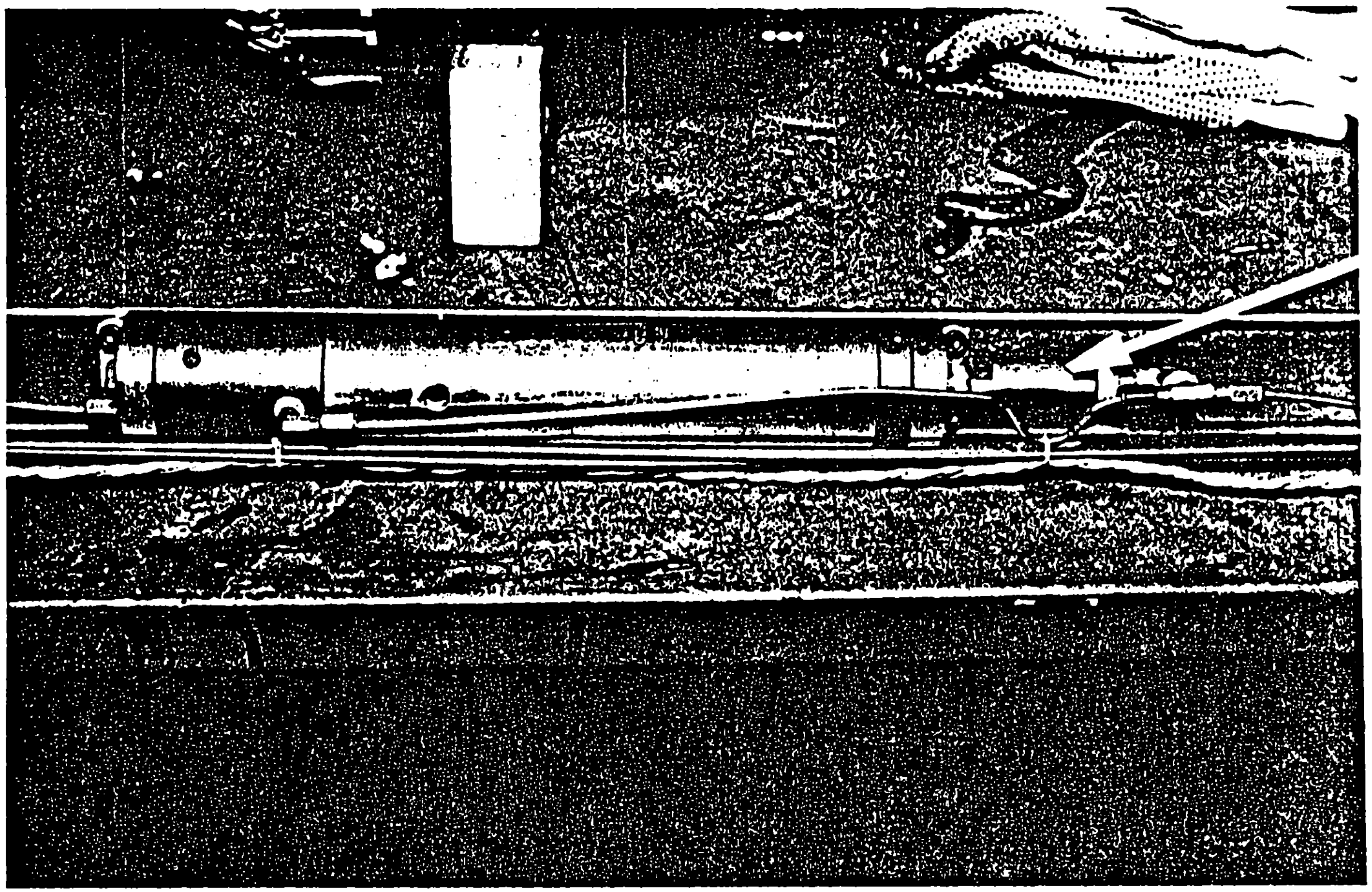
Where several Development Tools are competing for the same Mature Tool slot, DMP will require tha appropriate contractor to evaluate all tools and submit their multiple-tool evaluations to DMP for Panel consideration.

C.) Where an established third party tool is loaned for use in ODP, this tool will have to satisfy the criteria in paragraph B in order to be accepted as the technical equivalent of an ODP Mature Tool. Tools which do not satisfy these criteria cannot be programmed for future ODP legs.

D.) Last-minute requests to include an unproven third party tool within an ODP leg will not be accepted.

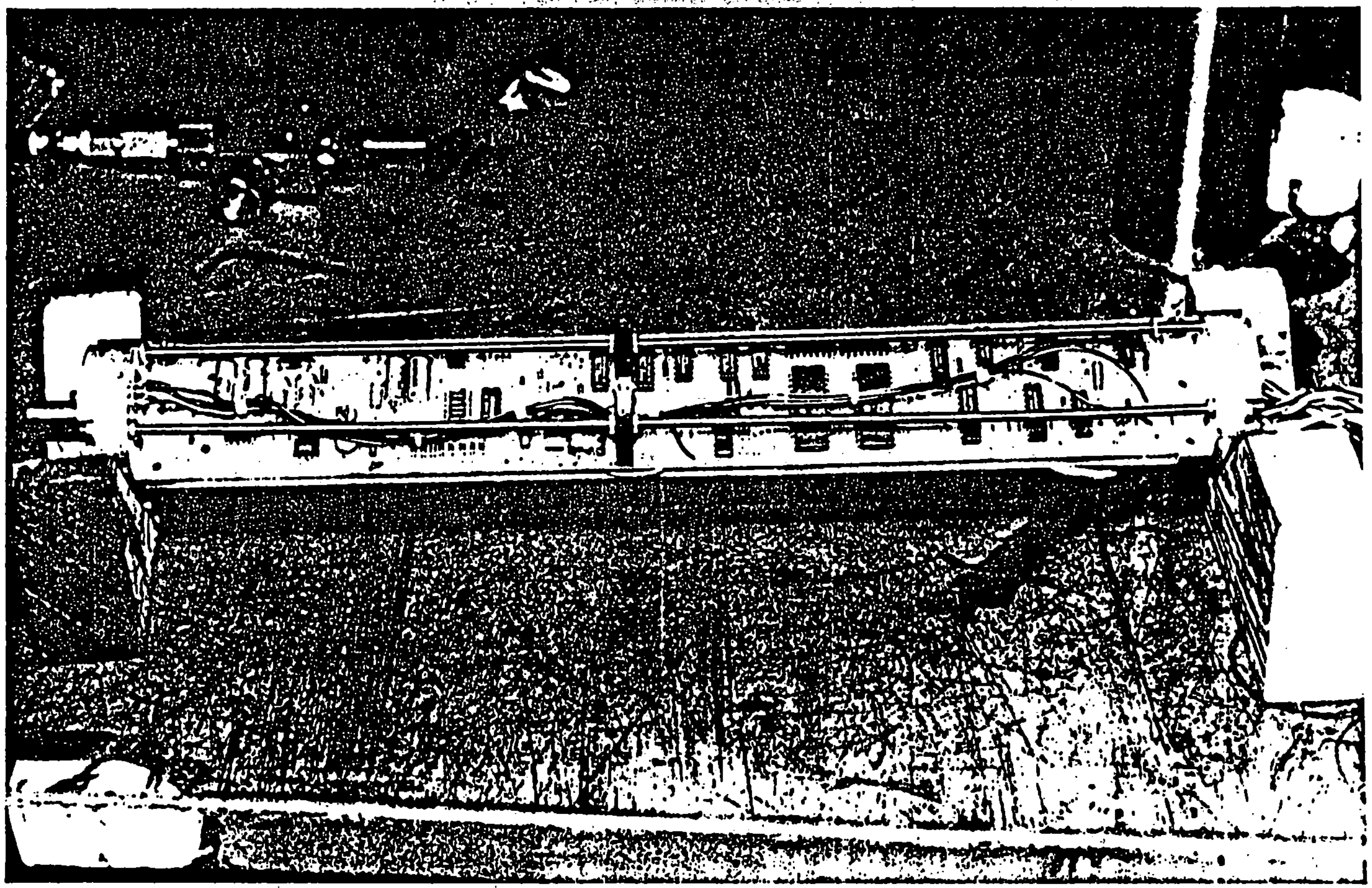


UPPER PACKER ELEMENT
FIG. 1



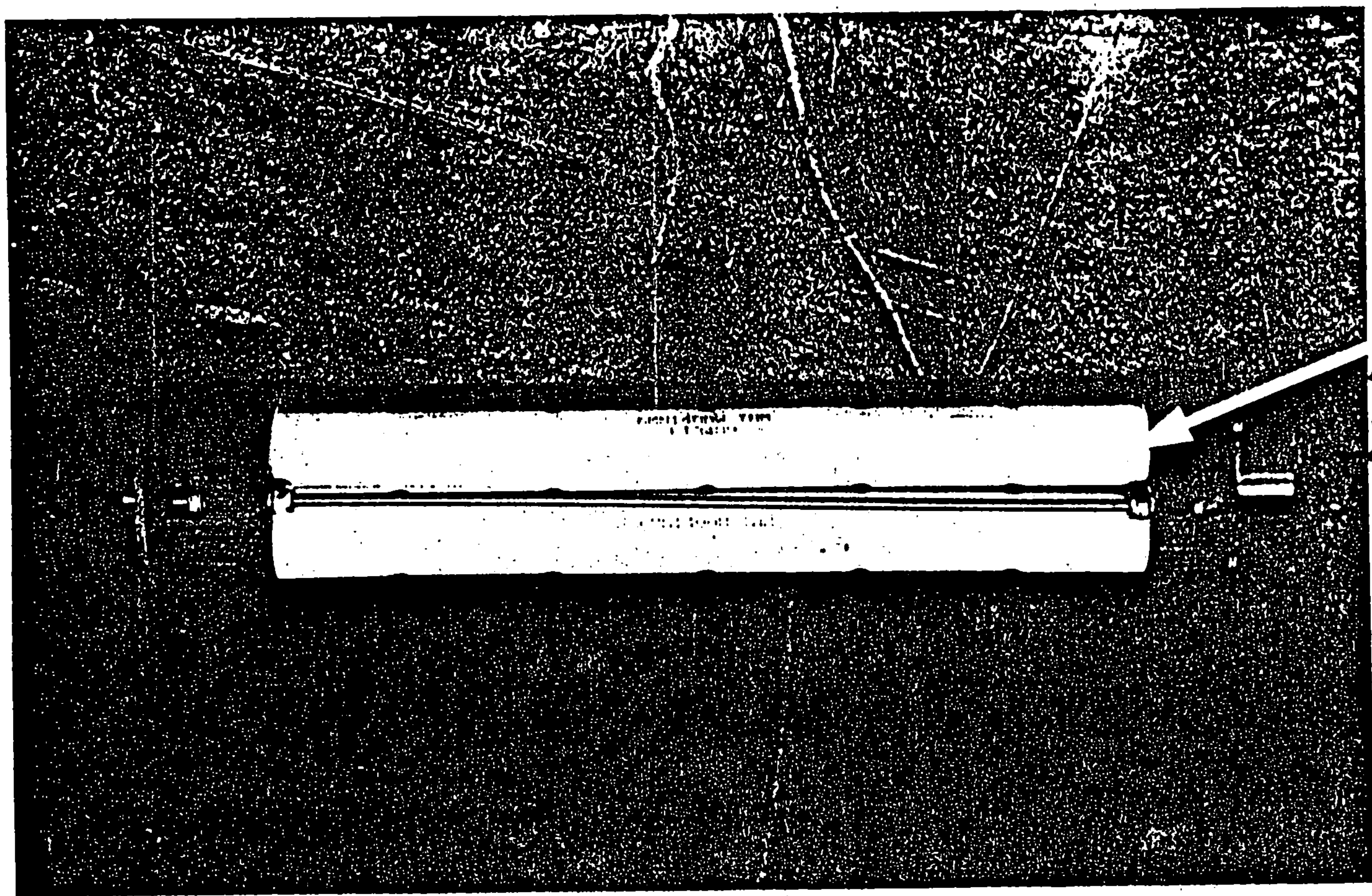
20cc SAMPLE BOTTLE (1 of 3)
FIG. 2

0000119



ELECTRONICS SECTION
FIG. 3

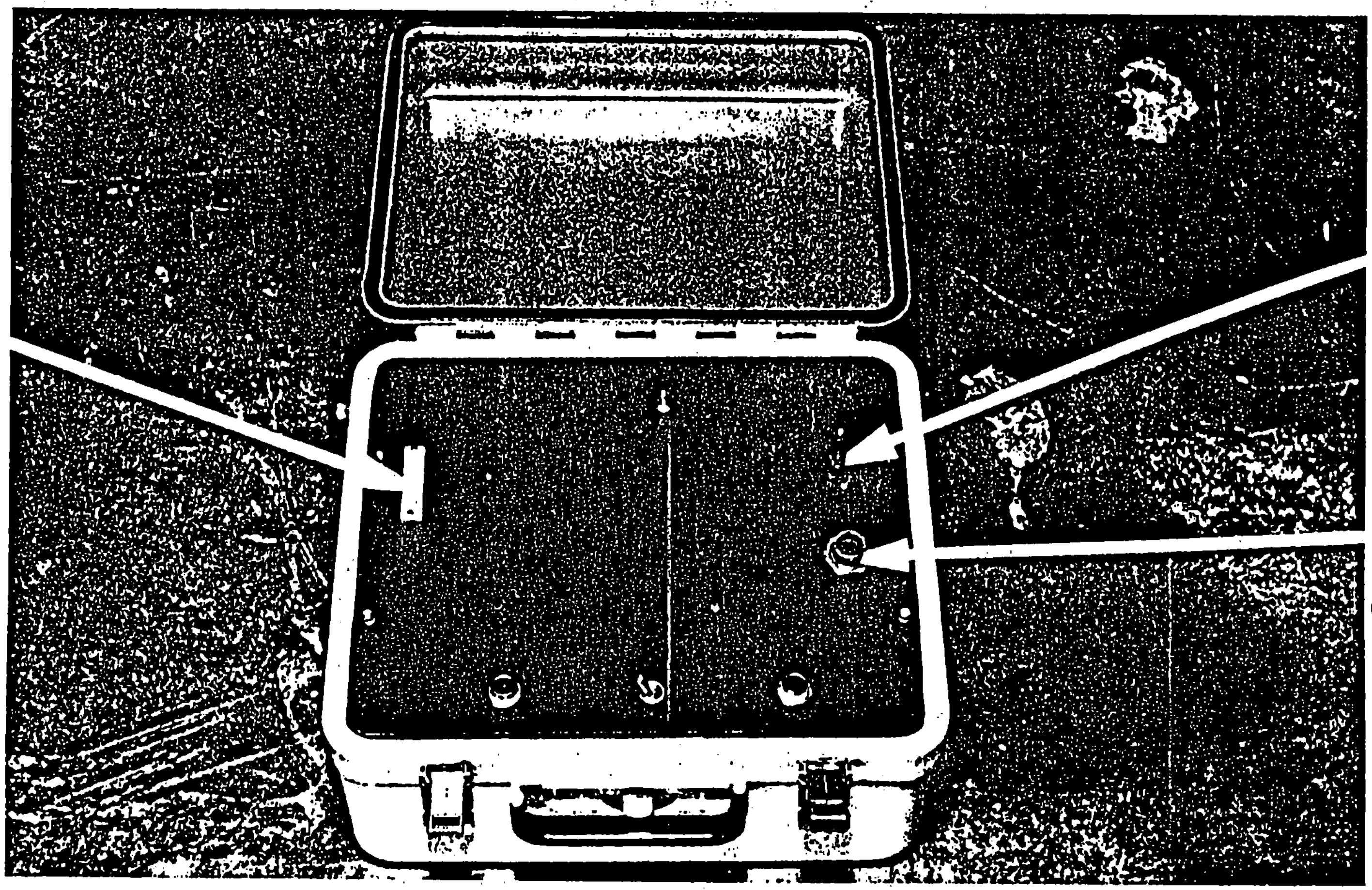
0000120



3-9 VOLT
ALKALINE
STICKS
5 HRS @
100°C

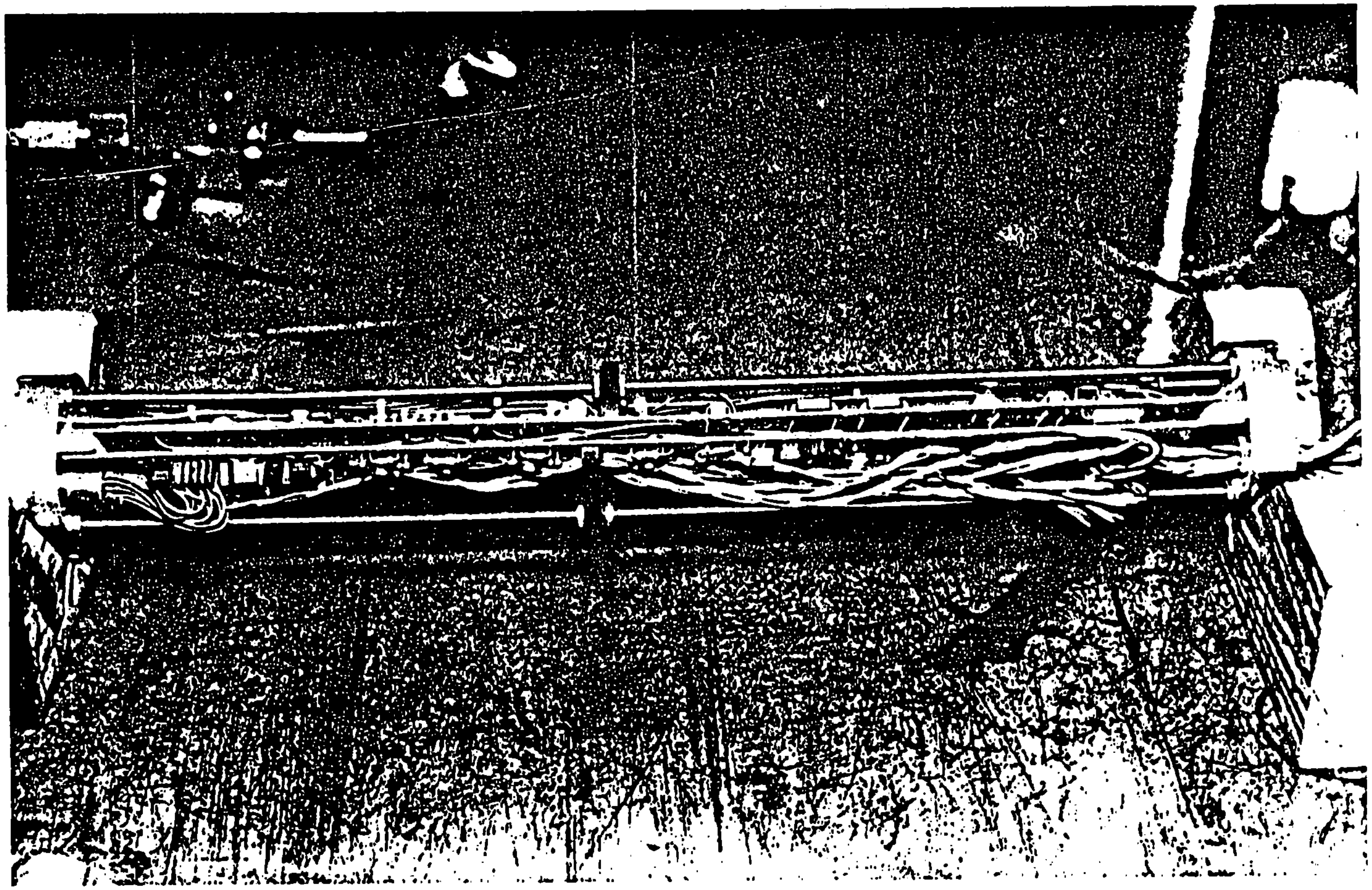
BATTERY PACK
FIG. 4

000121

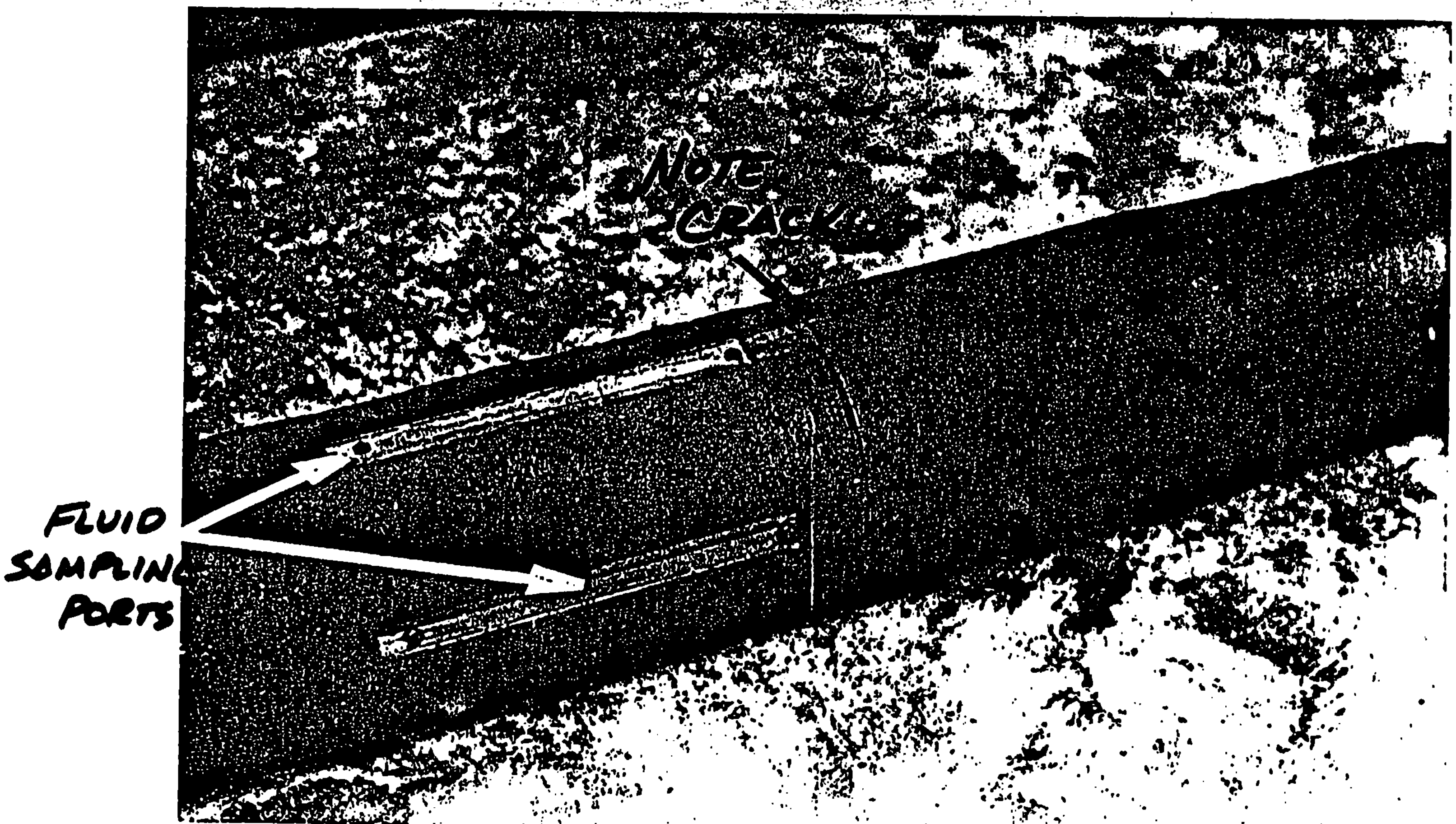


COMPUTER INTERFACE
FIG. 5

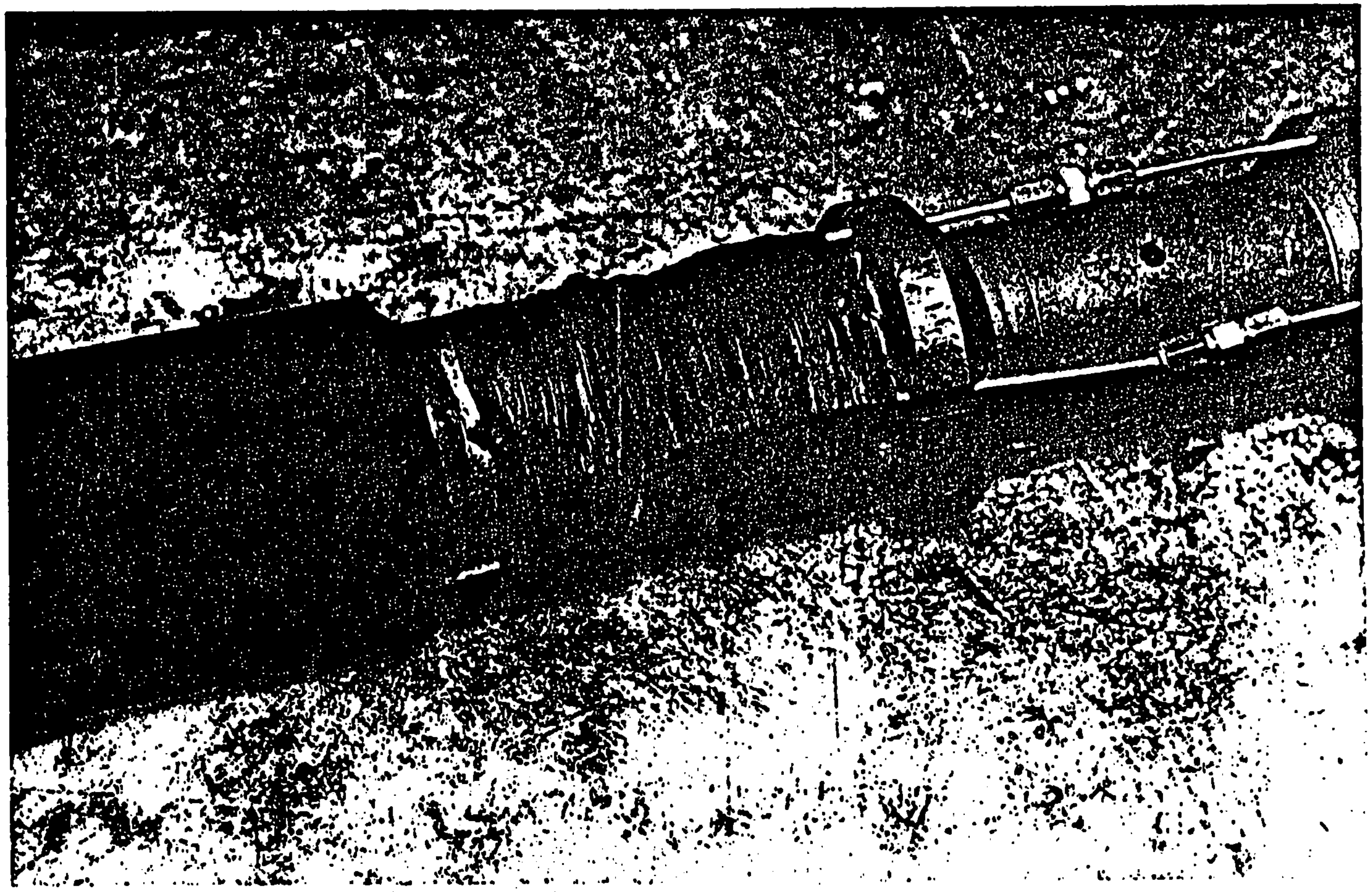
000122



ELECTRONICS SECTION
FIG. 6



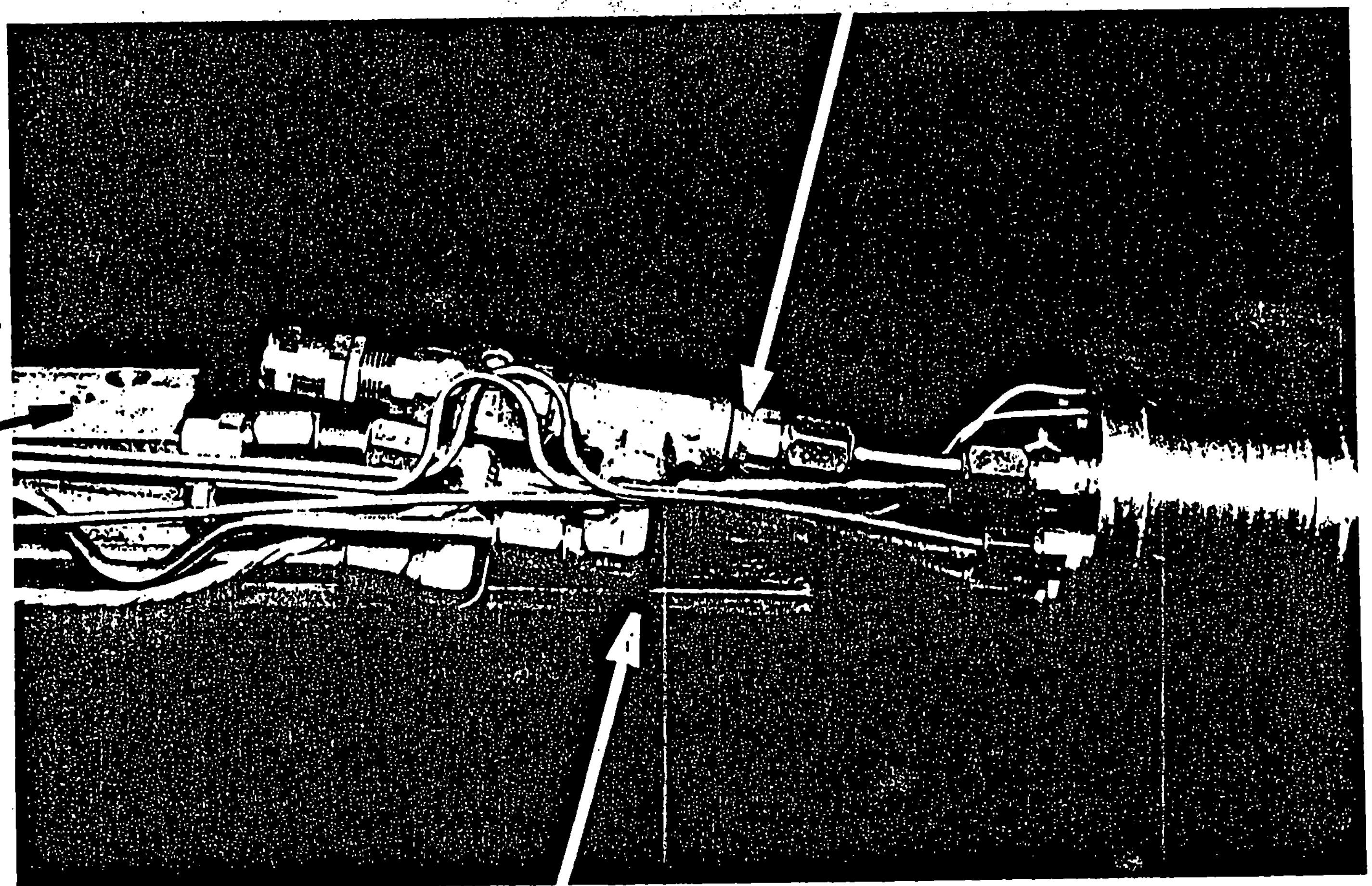
UPPER PACKER ELEMENT
FIG. 7



RUBBER BANDAGING
FIG. 8

CHECK VALVE

PACKER DEFLATE VALVE

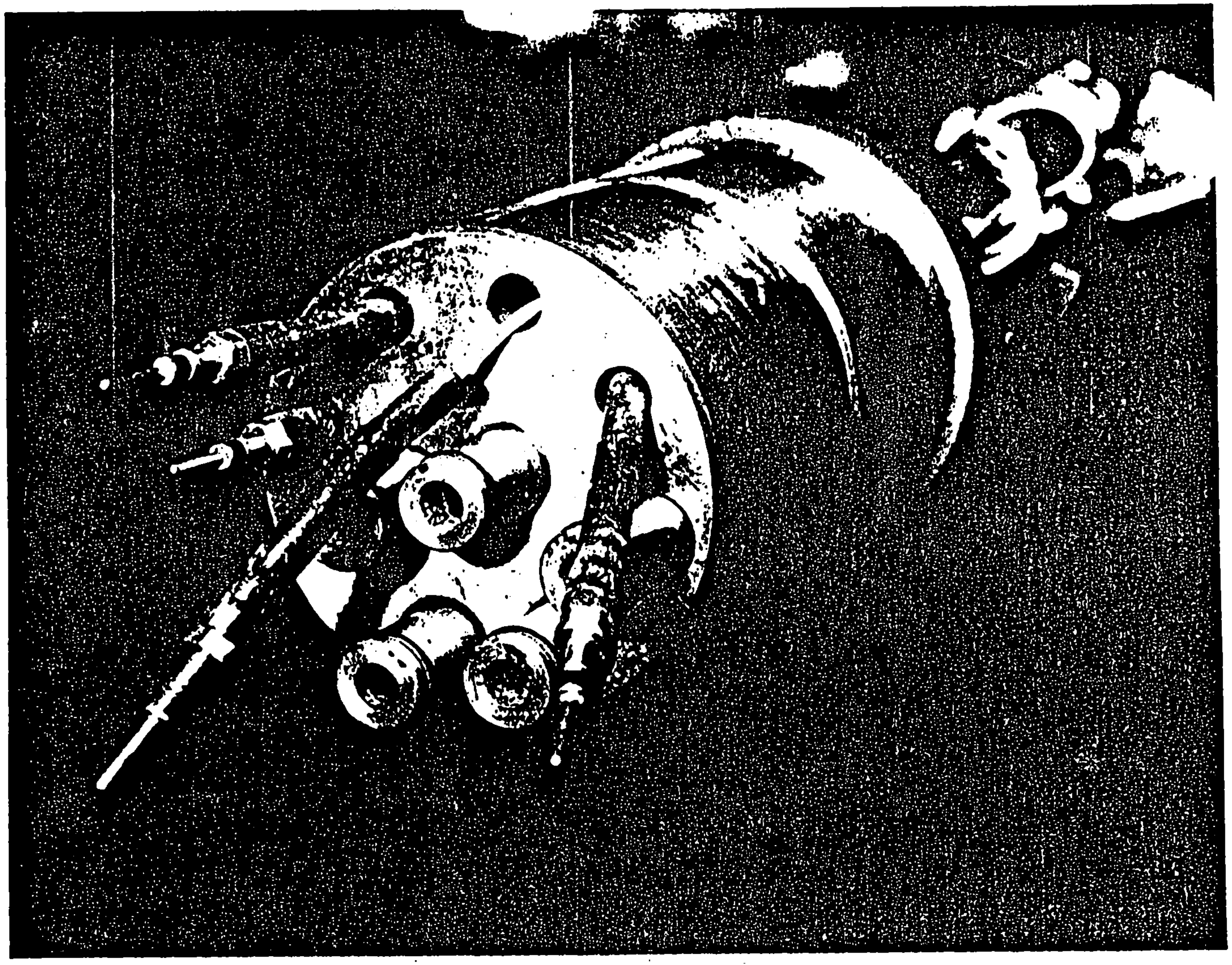


SUPPORT BAR

SUPPORT BAR / CHECK VALVE

FIG. 9

000126



BULKHEAD CONNECTOR FOR PINS
FIG. 10

0001127

000128

PHASE 1 COSTS FOR GEOPROPS PROBE DEVELOPMENT

PHASE 1			COST	SUBTOTAL
1) ADDITIONAL BENCH TESTS				
	Test Facility Setup		$3,000.00	
				$3,000.00
2) PORE FLUID SAMPLE TRANSFER UNIT				
	High Pressure pump		$500.00	
	High Pressure valves		$300.00	
	High Pressure hoses & fittings		$300.00	
	Transfer bottles		$1,500.00	
				$2,600.00
3) CALIBRATION SYSTEM				
	Gauges,test pipe,materials		$1,800.00	
				$1,800.00
4) SHOCK TESTING OF TOOL				
	Third Party test setup		$3,000.00	
	Repair of damaged parts		$1,000.00	
				$4,000.00
5) SPARE/EXPENDABLE PARTS				
	Thermistors (lot)		$88.00	
	Pressure Transducers (lot)		$4,250.00	
	O-Rings (lot)		$205.00	
	Shear Pins (lot)		$50.00	
	Fluid sampling port screens (lot)		$100.00	
				$5,693.00
6) PROTECTIVE RUBBER BOOTS				
	4 @ 250		$1,000.00	
				$1,000.00
7) SHIPPING & STORAGE CONTAINERS				
	6', 8', 10' boxes (2 EA)			
			Already	Budgeted
8) CONSULTANT ENGINEER				
	30 DAYS @ 500/DAY		$15,000.00	
				$15,000.00
TOTAL PHASE 1				$33,093.00

PHASE 2 COSTS FOR GEOPROPS PROBE DEVELOPMENT

PHASE 2			COST	SUBTOTAL
NON CORROSIVE MATERIAL CONVERSION				
	Materials		$5,200.00	
	Labor		$2,550.00	
				$7,750.00
SUPPORT SYSTEM			$4,000.00	
				$4,000.00
BULKHEAD CONNECTORS FOR PINS			$3,000.00	
				$3,000.00
PRESSURE CASES				
	Redesign of system		$10,000.00	
	Parts, seals, etc.		$5,000.00	
				$15,000.00
HIGH DOLLAR SPARE PARTS				
	Replacement inflation element		$6,488.00	
	Complete replacement straddle packer		$20,644.00	
				$27,132.00
TOTAL PHASE 2				$56,882.00
TOTAL PHASE 1 AND PHASE 2				$89,975.00

000130

ANNEXURE III

OCEAN DRILLING PROGRAM

REPORT OF JOIDES WORKING GROUP

ON

IN-SITU PORE FLUID SAMPLING

Conveners: P.F. Worthington (DMP/BP Research)
D.P. Huey (ODP/TAMU)

Held: 23 August 1991

John Willand Marriott
Houston
Texas

Endorsed by Joides Downhole Measurements Panel
16 October 1991

000132

CONTENTS

EXECUTIVE SUMMARY

From the standpoint of in-situ pore-fluid sampling, there are three types of borehole: those that draw in fluids from the ocean, those that produce fluids from the pore system, and those that are static. It is unlikely, but not impossible, that an uncontaminated pore-fluid sample will be recoverable from downhole tool deployment in a fluid-intake borehole. In a producing borehole, where the production rate is sufficient to allow pore fluids to occupy the entire well bore without residual contamination, it might be possible to sample pore fluids by sampling within the borehole itself: otherwise a shallow probe sampler might suffice. For static boreholes, which are seen as the more general case, five possible approaches to the problem of in-situ pore fluid sampling have been identified. They are listed below in increasing order of their operational impact:

(i) an upgraded version of the wireline packer, possibly used as an internal element with the straddle packer;

(ii) a self-boring pore-fluid sampler used in conjunction with the rotary coring system;

(iii) a full-bore straddle packer, possibly using multiple packers set in redrilled cement plug;

(iv) "top hat" re-entry deployment of modified commercial formation testers;

(v) conventional or modified drill-stem testing techniques.

It is proposed that these options be subjected to an engineering feasibility study as the logical next stage.

Different approaches will be necessary in the various types of rock formation that can be encountered. These range from fractured or fragmented formations to highly permeable unconsolidated sediments, to lower permeability indurated sediments and to very low permeability basement rocks. Given the range of conditions of wellbore hydrodynamics and rock coherence that can be encountered, it is likely that more than one tool-deployment option will be needed.

1. BACKGROUND

The need to obtain high-quality samples of formation fluids has stimulated an ODP technological objective that is supported by several of the Program's advisory panels. In order that this objective might be most effectively pursued, the JOIDES Downhole Measurements Panel (DMP) recommended to the JOIDES Planning Committee (PCOM) that a specialist working group be convened to advise on the most appropriate technical directions. This recommendation was accepted by PCOM.

The JOIDES Working Group on In-situ Pore Fluid Sampling, as approved by JOIDES PCOM, had been authorised to meet once only, that meeting to be held in the Houston area. The rationale behind this stipulation was governed by the need to draw upon targeted expertise in the oil industry, much of which was centred around Houston. The meeting was co-convened by Paul F Worthington, Chairman of the JOIDES DMP, and David P Huey, Supervisor of Engineering with ODP at Texas A & M University, the Program's Science Operator. The working group meeting took place on 23 August 1991 at the John Willand Marriott hotel, Houston, Texas. There were 25 attendees including representatives from ODP, industry, government laboratories and universities. In addition, six interested persons who were unable to attend the meeting contributed written suggestions or views.

2. PURPOSE

The working group meeting had two objectives:

(i) to formulate recommendations for developing the technology of in-situ pore fluid sampling to be used in ODP deep ocean boreholes;

(ii) to identify the most promising options as a lead-in to an engineering feasibility study to be conducted in the near future.

It should be noted that this initiative is concerned with sampling pore fluids and not borehole fluids. In flowing wells, these might be the same: if so, the problem can be reduced to one of effective sampling within the borehole column. In general, however, this is not the case, and therefore the exclusion of, or correction for, borehole fluids constitutes an essential technical requirement of the exercise. Further, there is the option to propose intermediate solutions pending further evaluation of the problem. This is an especially important point in view of the long-term interest in sampling fluids at high temperatures (350°C). The strategy is to solve the problem at conventional subsea temperatures before tackling the high-temperature problem.

A further complicating factor which argues in favour of a strategy of incremental development is the general lack of quantitative characterization in ODP boreholes of important formation properties that relate to fluid flow, especially permeability, nature of fractures (if any), and latent borehole stability. Furthermore, formation fluids are sought from two generically different regimes: hard rock and soft sediments. A reasonable first-approach strategy is to solve the hard rock problem initially with the expectation that such a tool would come close to satisfying requirements for fluid sampling in soft sediments. (It also must be noted that ODP currently employs an in-situ pore fluid sampler probe which is commonly deployed in soft sediments with some success.)

The output of the meeting would be a report submitted to JOIDES PCOM, with the endorsement of the JOIDES DMP. IF PCOM accept the recommendations of the working group, the matter would be placed in the hands of a technical steering group for implementation.

3. FLUID SAMPLING NEEDS OF THE GEOCHEMIST

The primary user of pore fluid samples and the data they provide is the geochemist. Russ McDuff (University of Washington) outlined the needs of the geochemist in terms of two key questions. Why do we need pore fluids? What demands do these interests place on sampling devices?

Pore fluid samples are needed to study chemical exchange between the oceans and oceanic crust. Pore fluids in subsea rocks were once seawater themselves, but they have subsequently been modified within the different temperature, pressure and chemical regimes that prevail in the rock systems. The degree of modification provides information on rock-water interchange. Thus, sea water is used as a hydrological tracer. The keys to this investigative process are the active fluid circulation zones within the subsurface. To investigate these most effectively, we need to delineate the spatial distribution of ionic constituents so that significant variations can be mapped over distances of tens to hundreds of metres. To do this, we need lots of samples of pore fluids.

Hitherto, pore fluid samples have been obtained through extraction techniques using sediments obtained from APC cores. A major problem has been the verification of shipboard observations through in-situ retrieval of pore fluid samples. Furthermore, in-situ sampling will be especially important for retrieving fluids from aquifers in hard sediments and/or hard rocks of Layer 2.

Sampling devices must allow key measurement needs to be satisfied in the face of technical constraints. These aspects are summarized in Table 1.

In general, a sample volume of 0.5 - 1.0 litres would be more than adequate for all purposes except isotope analysis. A depth resolution of 10 m would be acceptable. Sampler designs must take into account the need for analysis on deck, e.g. gases and liquids may require different handling approaches. Sampler construction materials must be selected to minimize the potential for contamination of trace elements.

Permeability is not well characterised in ODP holes and therefore the degree of invasion of drilling fluid (sea water) is not known. Further, ODP is interested in both sedimentary and basement rocks, which means that formation fluids will be sampled through both intergranular and fracture flow. These considerations raise additional questions concerning how much fluid volume should be produced before sampling and how samples should be taken in order to extrapolate the dilution profile back to uncontaminated pore fluids.

The current situation is that soft sedimentary rocks are sampled for pore fluids by advanced piston coring (APC) and squeezing the fluid out of the rocks on recovery. These samples are generally considered to be good, even though some pressure artifacts may exist. Technology is needed for recovering samples from hard sedimentary rocks and from basement rocks, which cannot be squeezed in their recovered form. A possible approach is to grind hard rock with known amounts of distilled water, then to squeeze the ground rock. This might allow useful data to be backed out provided that invaded zones are avoided. Again, in-situ samples would be needed to test the validity of the method. The primary requirement of technology is therefore to bring back pore-fluid samples "live" from both soft and hard rocks. In-situ geochemical measurements may be useful for screening purposes prior to sample taking but they are not adequate for meeting the needs of the geochemist.

4. CURRENT TECHNOLOGY

4.1 ODP Drilling and Sampling Practices

Dave Huey described the ODP leg structure with drilled depths mostly within the range 500 - 1000 m below sea floor. Common drilling/coring strategy is to use the Advanced Piston Corer (APC) in soft sediments, typically 200 m thick, the Extended Core Barrel (XCB) in stiff to hard sediments, and the Rotary Core Barrel (RCB) in basement. In-situ pore fluid sampling is presently limited to use of a probe (WSTP) which can be inserted into soft sediments ahead of the roller cone core bit at selected intervals between 10 m cores. The drilling system is based on a 5 and 5.5 inch drillstring with a 4.125 inch I.D. Sea water is the primary drilling fluid although bentonite mud slugs are spotted occasionally for cuttings removal to the seafloor. Cuttings returns are NOT taken back to the ship, i.e. the system is riserless. This means that fluid extraction from sampled hard rock, using a drilling-fluid tracer to correct for invasion, as practised in the oil industry, is not admissible here.

A wireline retrievable Pressure Core Sampler (PCS) can be deployed when drilling in the XCB mode to take cores of length 1 m which are returned to deck under hydrostatic pressure. The PCS does not yet allow the recovered solid sample to be accessed under pressure although the fluid might be accessed with skilful manifolding.

The Water Sampler/Temperature/Pressure tool (WSTP) is a probe tool that has recently been strengthened. This tool can recover samples from sediments soft enough for direct push-in insertion of a small probe (roughly 2-inch diameter by up to 1 m long). There are doubts about sample integrity although some investigators have reported good results in gathering representative soft/medium sediment pore fluids. The tool has recently been redesigned for durability and improved chemical inertness and may serve in some fashion as an interim sampling device.

A re-entry straddle packer system (TSP) is used occasionally for pulse/permeability tests in the open sections of cased boreholes. This tool would require a fluid sampling and pressure-drawdown capability in order to meet the requirements of an in-situ pore fluid sampler. A key issue is achieving open-hole seals with the two inflatable elements. Sealing is more difficult with sea water in the hole than with conventional drilling mud through which the creation of a mud cake enhances sealing capability. The inflated elements must also hold adequate up- and down-loads to allow for passive heave compensation of the drillstring. The pipe is then heaving relative to the deck of the ship which complicates access to the pipe for water sampler go-devils, electric wirelines and other instrumentation requirements. The TSP has also been used in casing where it was desired to test the entire open hole interval: again, sealing problems have been exposed.

The Motor-Driven Core Barrel (MDCB) diamond-cores a 3.75 inch pilot hole of maximum length 4.5 m through the Bottom-Hole Assembly (BHA) which contains a roller-cone bit. The aim is to deploy the Geoprops Probe, a probe tool designed to inflate packers and sample fluids in this fresh on-gauge hole. The Geoprops Probe is not yet proven technology. The limited lifespan of the large diameter, open-throat (4-inch I.D. between the roller cones) bits in basement rocks suggests that this approach would not constitute a long-term solution unless more durable bits can be developed (possibly anti-whirl PDCs or large kerf diamond bits).

4.2 Wireline Packer

Erich Scholz (Lamont Doherty Geological Observatory) outlined the status of the wireline packer, subcontracted over a three-year period to Stanford University and built by TAM, Inc., of Houston. The tool is of diameter 3.5 inches and is designed to be deployed in medium/hard rock (RCB/XCB cored) through 4-inch drillpipe and to inflate two packers to a diameter of 10-12 inches (Figure 1). Problems have been encountered getting power down to the packer inflation pump motors: a ruggedization of the downhole power supply should solve this problem. The packers are subjected to a very high expansion after which they have tended to stay deformed, preventing the through-pipe recovery of the tool. The total fluid flow path within the tool is 50 ft long and there are two troublesome zones of dead volume which contribute to sample contamination. The wireline packer is in real-time communication with the ship. A sample sensor chamber allows samples to be verified chemically before they are taken.

This project has passed through the prototype development stage and sea trials were attempted on one ODP leg. Following sea trials LDGO-BRG produced a highly detailed report summarizing the deficiencies discovered in the prototype tool and outlining plans for second generation improvements. That report was submitted to DMP. Figure 2 shows the proposed layout for the improved version of the tool. The project is currently dormant awaiting possible further funding (of the order of $100K) to develop a second generation tool. At this time such funds have not been approved.

4.3 Commercial Wireline Formation Fluid Samplers

Peter Wells (Schlumberger) reported that the Schlumberger Repeat Formation Tester (RFT), introduced in 1975, is to be replaced by a Modular Formation Dynamics Tester (MDT), a Phase I version of which is now available as an engineering prototype. The tool has a diameter of 4.75 inches and can be deployed in holes of at least 6 inches in diameter with a maximum practical diameter of 15 inches. Pressure and temperature ratings are 20 000 psi and 400°F, respectively. The MDT uses a "doughnut" packer which can be pressed against the borehole wall with up to 8000 lbs force.

A Phase II version of the tool is to become available within the next 9 months. This will offer two additional modules. The first is a multiprobe module of diameter 6 inches, in which flow can be initiated at one probe and pressure measured at two others, thereby overcoming wellbore damage effects on permeability determinations: the maximum differential pressure is 4000 psi. The second is a multisample module of diameter 4.75 inches which allows several fluid samples to be taken on each descent. The samples can be screened for resistivity and pumped out if not required.

The seals are doughnut packers. The pumpout module is used in reverse for packer inflation. The tool is about 100 ft long. Modules can be put together in any way, so that sampling can be done within 2 ft of the bottom of the hole. The primary goal is, however, better permeability measurement through improved pressure resolution. Development of a slimhole MDT of diameter 2.75 inches would be at least four years away.

A summary of the tool specifications of commercial formation samplers is presented in Table 2. A clear option is to confine ourselves to commercially available tools and to drill dedicated holes to accommodate them or deploy them in re-entry holes (either full-sized cone or mini-cone) where opportunities arise, i.e. in conditions similar to current open-hole straddle-packer work. The tools would probably require modification from doughnut seals to packer seals in order to operate meaningfully in fractured rocks. Peter Wells made it clear that Schlumberger tools are designed specifically for the types of formation typically containing hydrocarbon reserves and are not necessarily optimal for pore fluid sampling under the wide range of conditions that may be encountered in ODP boreholes. Even in the slightly-more-predictable world of oil and gas drilling, the practice of formation fluid sampling is considered by the experts to be more art than science; Schlumberger maintains a "suck and see" philosophy in the general application of their samplers.

None of the commercial tools is capable of operating under standard ODP conditions, i.e. running through a 4-inch I.D. drillpipe and expanding to pack-off an interval of diameter 10-12 inches. However, with modified seals they might work in a dedicated hole. A key issue would be the effectiveness of the packer seals in the absence of a mud cake: some authorities believe the presence of a mud cake on the borehole wall is essential to achieving suitable open-hole packer seals. It remains to be demonstrated whether or not packer seals sufficient for our purpose can be obtained in ODP holes without a mud cake.

4.4 Drill Stem Testing

Lance Rayne (Halliburton Reservoir Services) described state-of-the-art drill stem testing (DST) technology. The drill stem test is an exploratory tool commonly used in the oil patch to clean up the invaded zone surrounding the wellbore and to determine formation-flow and pressure properties relevant to the later production of the well. There are two types of DST: cased hole and open hole. Cased hole DSTs are run when formations are low pressure or water sensitive, or there is not likely to be an adequate packer seat zone. Cased hole DSTs are more expensive and complex. Open hole DSTs are just the opposite, but they are more of a gamble. In the oil industry the gamble is the possibility of stuck pipe, live gas or oil back to surface, and exposing the entire open hole interval to reservoir pressure; in ODP's case the primary problem would relate to the risk of stuck pipe. The type of DST run depends upon the company, the hole, and the formation.

Common practice by Halliburton is to go in with an underbalance using compression-set or inflatable packers of length 4 ft. Small diameter tubing is often used as the deployment string for cased hole DST. Coiled tubing as a conveyance mechanism has been explored and could be an option for ODP, except that the tubing has a 15 000 ft depth limit: this would be restricting for ODP and would, in any case, create a storage problem on board ship. Drillpipe is the conveyance device for open hole DST. Halliburton does possess a slimhole test string of diameter 1.75 inches.

As a means of in-situ pore fluid sampling DST offers proven technology plus the advantage of gaining permeability and formation pressure measurements as well as numerous opportunities for fluid sampling. Flow times to achieve adequate sample sizes of representative formation fluid samples can range from a few minutes to a month or more. This would be the most powerful and, probably, most promising method to achieve in-situ pore fluid samples for ODP holes. It would also be the most expensive and time-consuming approach.

Robert Desbrandes (Louisiana State University) described his US patent for a new DST tool, which can be added to a conventional DST assembly. This tool allows for a very slow decompression of the fluid trapped below the packer instead of the conventional fast pressure drop. As the fluid expands, the pressure decreases linearly with time until the formation pressure is reached. At that point the formation starts to flow and the slope of the pressure curve changes. If surface monitoring is available, it is possible to compute the pressure derivative with respect to time: this helps to determine the start of formation flow. If drawdown is allowed to continue, permeability can be evaluated. The exact formation pressure can be determined by stopping the drawdown as soon as formation flow is detected and observing the subsequent mini-build-up. The new technique is particularly useful in low permeability formations, where a conventional DST can be recorded as "dry".

4.5 Air-Lift Sampling

Karl-Erik Almen (Sweden Nuclear Fuel and Waste Management Company [SKB]) described sampling practices for nuclear waste disposal in 2-inch diameter holes of depths up to 1500 m. Downhole computer-controlled tools are used. These comprise pumps, switching valves, Eh/pH flow-through cell, and water sampler. The tools are operated with an umbilical line. Packers are water-pressure inflated through hoses in the umbilical line. Fluid is air-lifted from between the packers. A tracer is added to the drilling fluid in order that the integrity of the recovered sample might be confirmed.

4.6 Bottom-Hole Core and Test System

Robert Desbrandes described a procedure designed for obtaining pristine fluid samples in oilfield environments. A drillstring with a basal packer is lowered to the bottom of a hole. The bottom-hole rock face is cleaned by circulating (with seawater). A slug of mud may be needed for the packer to make an effective seal. The packer is set and an inner assembly with drilling, coring and sampling capability is lowered through the drillpipe. The inner assembly is linked to the surface by coiled tubing. Underbalance is created by airlifting through a second tube in the upper part of the drillpipe. The in-pipe assembly is used with a small diameter downhole motor to drill beyond the drillstring and the formation is allowed to produce. Formation fluid moves up the annulus between the drillpipe and the assembly where it can be tested and sampled. There is no invasion because of the maintained underbalance.

The system is conceptual at the present time. Engineering studies of the concept are continuing while commercial participation is sought.

5. GENERIC REQUIREMENTS

As an aid to discussion of various proposed fluid sampling tools, technologies and methodologies, the following were identified as essential components of any in-situ pore fluid sampling system that might be devised. Any valid approach to fluid sampling must incorporate the principal elements.

5.1 Isolation of Sampling Zone from Borehole Fluid

Elastomeric packers
Cement bags
Insertion probes
Eutectic metal packer poured in place
Long seal by cement injection
Locally created mud plug to assist packer seals
Tracer detection of invasive drilling fluids to identify isolation failures

5.2 Pressure Differential/Drawdown Methods

Hydrostatic imbalance
Gas lift

Vacuum
Pumps (downhole or on deck)
Piston action (small scale or full pipe swab)
Fluidic motor/pump combination
Explosive suction (gas lift, vacuum)

5.3 Filtering

Sand packs, gradient
Sintered metals, screens

5.4 Sample Receptacle(s)

Stainless
Titanium
Rubber bladder
Glass coated
Transportable

5.5 Downhole Instrumentation

Process verification (resistivity)
Temperature
Pressure

5.6 Running/Retrieving Equipment

Accommodate temperature expansion
Prevent lifting of spring-loaded valves off-seat with subsequent contamination
Must be ODP compatible

6. POSSIBLE APPROACHES

The meeting broke into syndicate groups to consider possible approaches to the problem of in-situ pore fluid sampling. Each attendee was asked to participate in one group selected from the generic categories of possible solutions listed below. The solution groups are prioritized here as most-to-least attractive for ODP from the operational point of view, i.e. how easily they could be assimilated into existing ODP operations and have the least impact on other use of ship's time. Clearly, the easiest/lowest impact plan may not necessarily be the best or most desirable when additional factors are considered, i.e. probability of success, cost, degree of new development required, time to bring to fruition, etc.). Thus, each of the groups is still considered viable until further feasibility analysis work is done.

(i) electric wireline deployable through-pipe tools < 4 inch diameter

(ii) Other tools/probes < 4 inch diameter (not electric wireline deployed)

(iii) Straddle packer with enhancements for water sampling

(iv) "Top Hat" deployment of tools > 4 inch diameter

(v) Conventional or modified drill stem testing methods

The following are summaries of the group deliberations. No one at the meeting opted for group (v), drill stem testing, since the approach in that case was considered self-evident.

6.1 Modified Wireline Packer

A functioning wireline sampler would provide the best of both worlds: everyday use through the drillstring and real-time communication. The development of a second generation tool is a viable alternative. The known problems with the prototype tool must first be rectified by restructuring its layout. The filter must be relocated close to the intake. The sample bottles should be positioned as close to the intake as possible. The remaining problem is that of packer deflation to permit passage back through the drillpipe. In its present form as a stand-alone tool, disposable packers could be used in non re-entry holes. This is feasible because the packers are of low cost and are unlikely to be suitable for re-use. We are currently limited to 350-400 psi maximum pressure differential across packers even though the pumps are capable of providing 1 kbar. This pressure differential could be increased in a smaller hole, e.g. a DCS or an MDCB hole, thereby providing a more effective seal. An alternative solution would be to use the tool as an inner element in conjunction with the drilling-deployed straddle packer. Both options could, of course, be progressed together. Either way, a careful study of the mechanical characteristics of commercially available packers is essential. The traditional supplier may not be the best. Others have suggested that they might be able to supply a packer with significantly higher differential pressure capability.

Other considerations and recommendations are:

Drawdown	-	the tool has a proven pump
Filtering	-	a coarse screen at the primary intake plus a fine filter at each individual sample bottle
Sample Receptacle	-	possibly titanium
Instrumentation	-	surface readout of pressure, temperature and resistivity
	-	quartz gauges for pressure and temperature
Running/Retrieving	-	7-conductor wireline

Development could take place in two stages: Phase I - development of restructured system with pressure, temperature and fluid resistivity sensors: Phase II - addition of advanced chemical sensors.

6.2 Self-Boring Fluid Sampler

This is conceived as a non-wireline tool. The rotary coring system produces a nominal 10-inch hole. There is a 2.31-inch opening in the throat. The concept is to extend a 2-inch diameter self-boring probe out through the roller cone bit and allow it to drill ahead of the bit (perhaps 1 m). One packer element in the form of an extended tapered cork could be used to seal the 2-inch hole. Pressure drawdown could be introduced by imbalanced pistons in a sample bottle within the drilling assembly.

The group accepted that this concept represents much new technology and would take a significant development effort to perfect.

6.3 Straddle Packer with Enhancements

The existence of the TAM Straddle Packer makes it an attractive starting point for enhanced technology to achieve hard-rock formation-fluid samples. A generic problem with packer deployment has been obtaining good seals (although the TSP might fare better than most in this respect). This difficulty would be mitigated somewhat by aiming at more easily sealed formations (hard rock that is no more than slightly fractured) and might be solved by using multiple packers and setting them in redrilled cement plugs. In partially cased holes one packer could be set in the casing shoe.

Drawdown and appropriate sample receptacles would have to be added to the TSP facility to produce a pore fluid sampling capability. Possible means of achieving adequate pressure differential to force the formation to produce into the interval between the packers are:

gas lift using coiled tubing or DCS tubing to introduce high pressure air to the inside of the drillstring a few hundred feet below the keel (there are problems with heave compensation compatibility),

conventional inside-the-pipe swab techniques,

a downhole pump operated by repeated tensioning of the sandline.

6.4 Top-Hat Re-entry Deployment of Large Tools

Downhole tools larger than 3.75 inches in diameter need a method of conveyance to the seafloor other than the standard through-pipe method. The "Top Hat" deployment is an idea or conceptualization whereby the logging tools will be attached to the end of the BHA with an internal female wet-connect which will later latch up to a male wet-connect that will be pumped down the drill pipe after re-entry is achieved. The Top Hat will be needed to protect the tool from damage when stabbing into the re-entry cone. This is visualized as a piece of casing that will cover the tool and latch into the re-entry cone to disconnect itself from the tool so that the tool can be lowered into the hole under its own weight. Another possibility is to allow the tool to remain fixed to the BHA and deploy it downhole by running drillpipe in a manner identical to current logging practices in horizontal wells. In either case the side-entry-sub would be included at the top of the drillstring as shown in Figure 3. The figure shows the side-entry-sub adjacent to the Top Hat as re-entry is about to occur.

The group pointed out that the above technique would be complicated by the problem of the umbilical line to the re-entry TV being present in the water external to the pipe at the same time as the logging line. A better solution might be as follows. The logging tools and BHA are assembled on the rig floor and lowered to the seafloor with the drill pipe. When the assembly is in close proximity to the re-entry cone, the underwater television will be lowered to assist the re-entry process. The Top Hat will stab into the re-entry cone and the TV will then be recovered. The side-entry-sub will then be added to the top of the string and the logging line will be run to the bit and attached via wet connect. By means of a J-latch or some other latching method, the Top Hat will release from the tool and either the assembly will be free to proceed down hole or the pipe will be run into the hole to convey the tool.

After sampling is completed the tool can be brought back to the surface by relatching it into the Top Hat and tripping the pipe until the side-entry-sub reaches the floor. The sub can then be removed, the wet-connect unlatched, and the wireline retrieved. The drill pipe is then tripped out until the tool reaches the surface and the samples are retrieved.

The Top Hat approach is compatible with commercially available formation testers. It might provide important preliminary information on formation permeability and the volume of flow needed to obtain a true pore fluid sample. Doughnut seals may not be adequate for ODP purposes because they are not designed for fractured rocks: a packer tool is needed but this might be achievable through modification of existing commercial tools in the absence of diametral constraints. To ensure adequate sealing it may be necessary to spot about 100 m of cement after logging, to drill through it, and then to deploy a packer formation tester with the upper packer in cement and drawdown created by a pump module up above. Produced fluids could be monitored for resistivity.

6.5 Resume

A summary of the attributes of these four possible approaches is presented as Table 3.

7. FUTURE DIRECTION

The next stage is to set out the fruits of these deliberations for technical scrutiny and advancement. The Messages of Sections 4 and 6, viewed in the light of the generic requirements of Section 5, provide a basis for an engineering feasibility study.

The objective of the feasibility study would be to evaluate the technical and economic feasibility of the identified candidate concepts weighed against their probable ability to produce the desired scientific results. It is anticipated that such a study could and should be completed before the end of calendar year 1992. The feasibility study should be directed by a steering group that contains both scientists and engineers. The feasibility study should be carried out by an appropriate consulting engineering firm, selected by competitive bid, monitored by ODP-TAMU, and reporting to the steering group at the end of the study. Results of such a study should lead to immediate identification of the most promising technological paths which should then be funded and pursued.

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APPENDIX

JOIDES WORKING GROUP ON IN-SITU PORE FLUID SAMPLING

LIST OF MEMBERS

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		(D)	Roger N Anderson	(Lamont-Doherty Geological Observatory)
			James T Aumann	(Aumann & Associates)
			Edmond I Bailey	(Stress Engineering Services)
			Greg Bayhurst	(Los Alamos National Laboratory)
(B)			Keir Becker	(RSMAS, University of Miami)
			Ronald Boggess	(Fugro McClelland)
(B)	(C)		Hugh Crocker	(Crocker Data Processing)
	(C)	(D)	Robert Desbrandes	(Louisiana State University)
			Wayne A Dunlap	(Offshore Technology Research Centre, TAMU)
(B)		(D)	Andy Fisher	(ODP, TAMU)
(B)		(D)	Glen Foss	(ODP, TAMU)
			Flip Froelich	(Lamont-Doherty Geological Observatory)
			Bob Green	(Baker Sand Control)
(A)		(D)	David P Huey	(ODP, TAMU)
			Craig Hyland	(Terratek Drilling Labs.)
(B)	(C)		Peter Lysne	(Sandia National Laboratories)
			Raymond Madden	(Madden Systems, Inc)
			Russ McDuff	(University of Washington)

		(D)	Scott McGrath	(ODP, TAMU)
			Dodd Miller	(Baker Oil Tools)
			Jack E Miller	(Stress Engineering Services)
			Bill Mills	(ODP, TAMU)
	(B)	(D)	Tom Pettigrew	(ODP, TAMU)
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			Kenneth Schmitt	(Stren Co.)
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(A)	(C)	(D)	Paul F Worthington	(BP Research)

(A) Co-convener
(B) Unable to attend working-group meeting: written contribution
(C) Member of JOIDES Downhole Measurements Panel
(D) Provided editorial contribution to the report

TABLE 1

GEOCHEMICAL REQUIREMENTS OF FLUID SAMPLES

Measurement Needs	Classification/Status	Sample Volume	Problems
Major anions/cations (Ca, Mg, Na, K, Cl)	Essential/Routine	Few millilitres	Artifacts Handling protocol
Bioactive/Redox sensitive (C, N, P, S)	Essential/Routine	10 millilitres	Integrity Handling protocol
Gases Inert (especially He) Reactive (e.g. CH_4)	Essential/Routine	50 millilitres (gas tight)	Integrity Handling protocol
Trace Inorganics	Desirable/Research	Few millilitres	Contamination
Trace Organics	Desirable/Research	Few millilitres	Contamination
Isotopic Tracers	Desirable/Research	Tens of litres	Handling protocol

Notes

ARTIFACT = reaction between formation and fluid induced by the act of sampling, e.g. imposition of a pressure gradient

INTEGRITY = samples continue to act in the sampling device as they did in situ, so that they can be studied as they are, not as they have become.

TABLE 2

COMMERCIAL FORMATION TESTERS

Company	Tool	Temp (°F)	Tool Diam. (in.)	Minimum Hole Size (in.)	Maximum Hole Size (in.)
Atlas	FMT	350	5.13	5.88	9.88
			6.25	7.13	12.25
			7.88	8.75	16.00
			9.19	10.13	20.00
BPB*	SRFS	300	3.50	4.00	6.00
Schlumberger	RFT	350	5.20	6.50	15.50
	RFTTN-OH	400	3.38	4.75	6.75
	MDT	400	4.75	6.00	14.25
Halliburton	SFT	375	5.50	6.25	14.25
	SFTT-B	375	4.75	5.50	8.63
			6.50	7.38	19.00

* development phase

FMT - formation multitester
RFT - repeat formation tester
RFTTN-OH - ditto, slimhole, HE
MDT - modular formation dynamics tester
SRFS - slimhole repeat formation sampler
SFT - selective formation tester
SFTT-B - sequential formation tester tool

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TABLE 3

SUMMARY OF OPTIONS

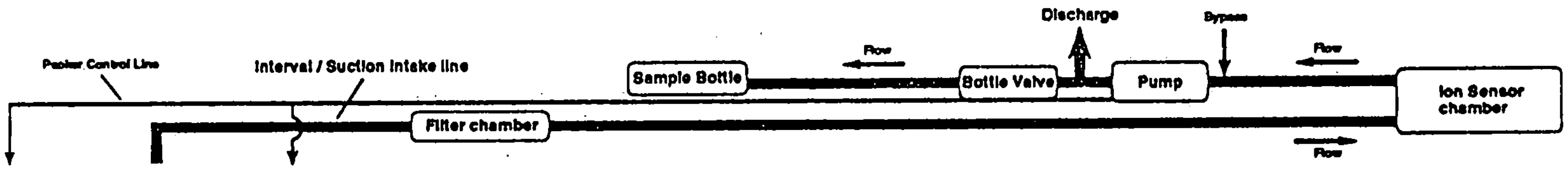
Option	Tool Available Commercially	Rapid Deployment	Real-time Communication	Low Development Costs	Absence of Serious Diametral Constraints	Comments
Modified Wireline Sampler	No	Yes	Yes	No	No	Not in re-entry holes
Self Boring Fluid Sampler	No	Yes	No	Yes	No	Can be used at intermediate depths
Full-Bore Straddle Packer	Yes/No (4)	No	No (3)	Yes/No (4)	Yes	
Top-Hat, Commercial Formation Sampler	Yes (1)	No	Yes	No (2)	Yes	Requires a re-entry hole

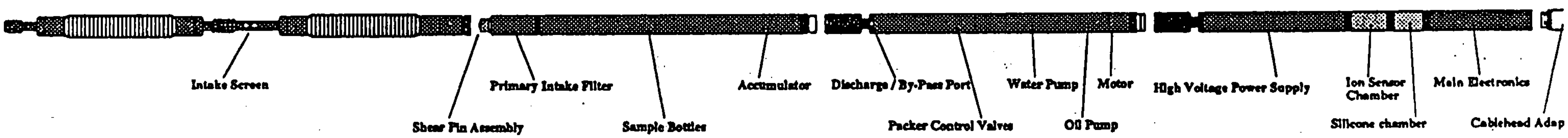
(1) with some modification
(2) costs increased by need for a re-entry hole and commercial leasing requirements.
(3) possible if sensor is added to sample receptacle and deployment is by electric wireline as with the straddle-packer/flow-meter.
(4) Straddle packer already exists but the addition of sampler and drawdown capability could become complex and costly.

Existing Wireline Packer Layout:

This figure illustrates the path of the sample fluid flow and the configuration of basic components in the existing system. The Sonde is approx. 45 feet overall, fluid path from Interval to Bottle is approx. 55 feet.

Fluid Paths





Straddle Packers:
This section consists of the upper and lower packers.

Sample Bottle Section:
This section contains the 4 sample bottles, and the accumulator for the pump/motor section. The lower pressure case contains the primary filter.

Pump / Motor Section:
This section contains the motor, Oil pump, hydraulically driven water pump, and the packer / sample bottle control valves.

HVPS and Main Electronics Section:
From top to bottom, this section is comprised of 4 pressure case. The upper case contains data acquisition and valve control electronics. The middle two cases contain the silicone oil filled sensor pressure compensator and the Ion sensor chamber, respectively

The lower pressure case contains the High Voltage power supply.

Not to Scale

Figure 1

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Proposed

Restructured Wireline Packer layout:

This figure illustrates the path of the sample fluid flow and the new configuration of basic components. The design is optimized for minimum tubing length and fluid volume before the sample bottles, and minimum hydraulic and electrical interconnection between cartridges.

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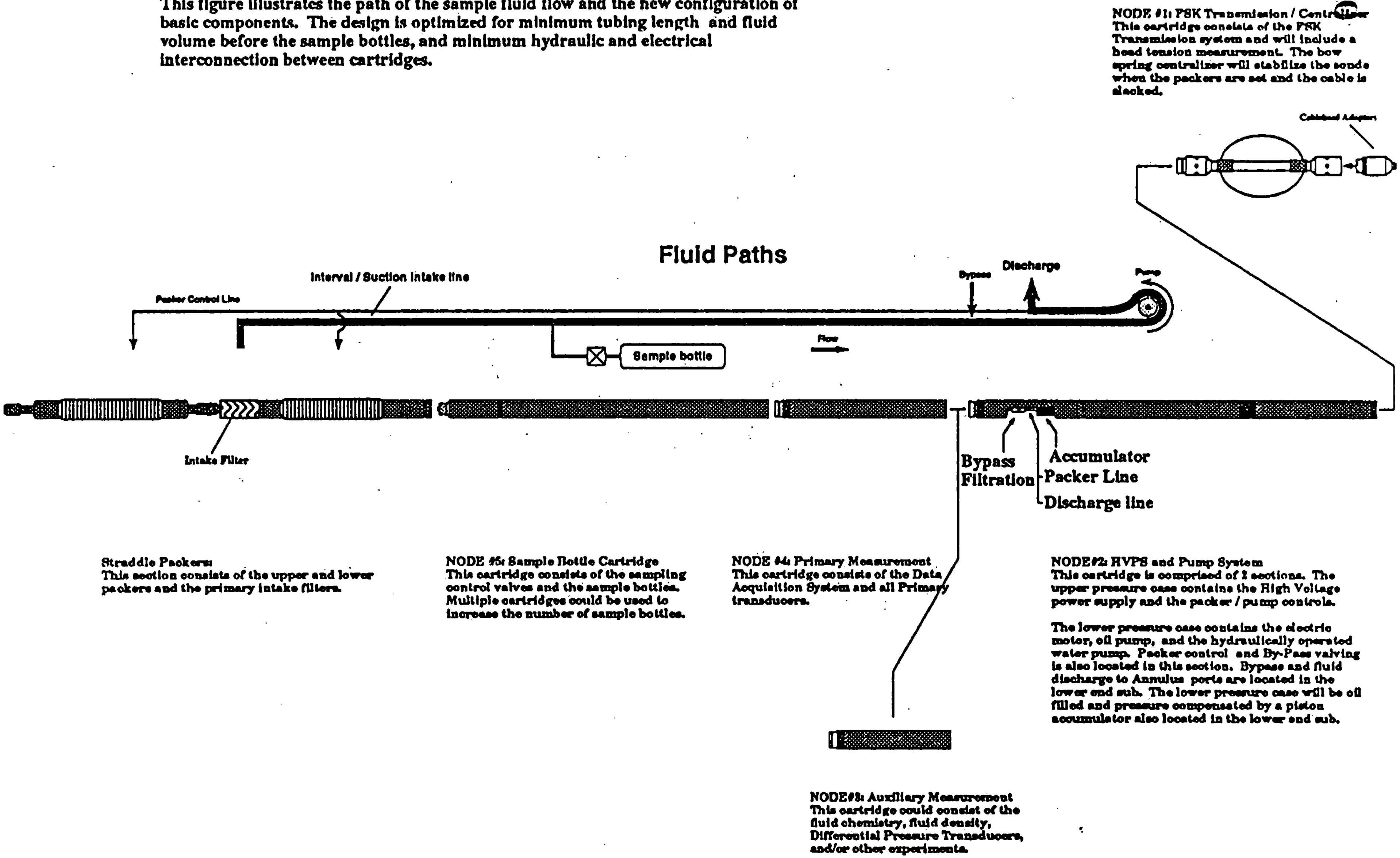

Not to Scale

Figure 2

"TOP-HAT" DEPLOYMENT OF TOOLS > 4" DIA.

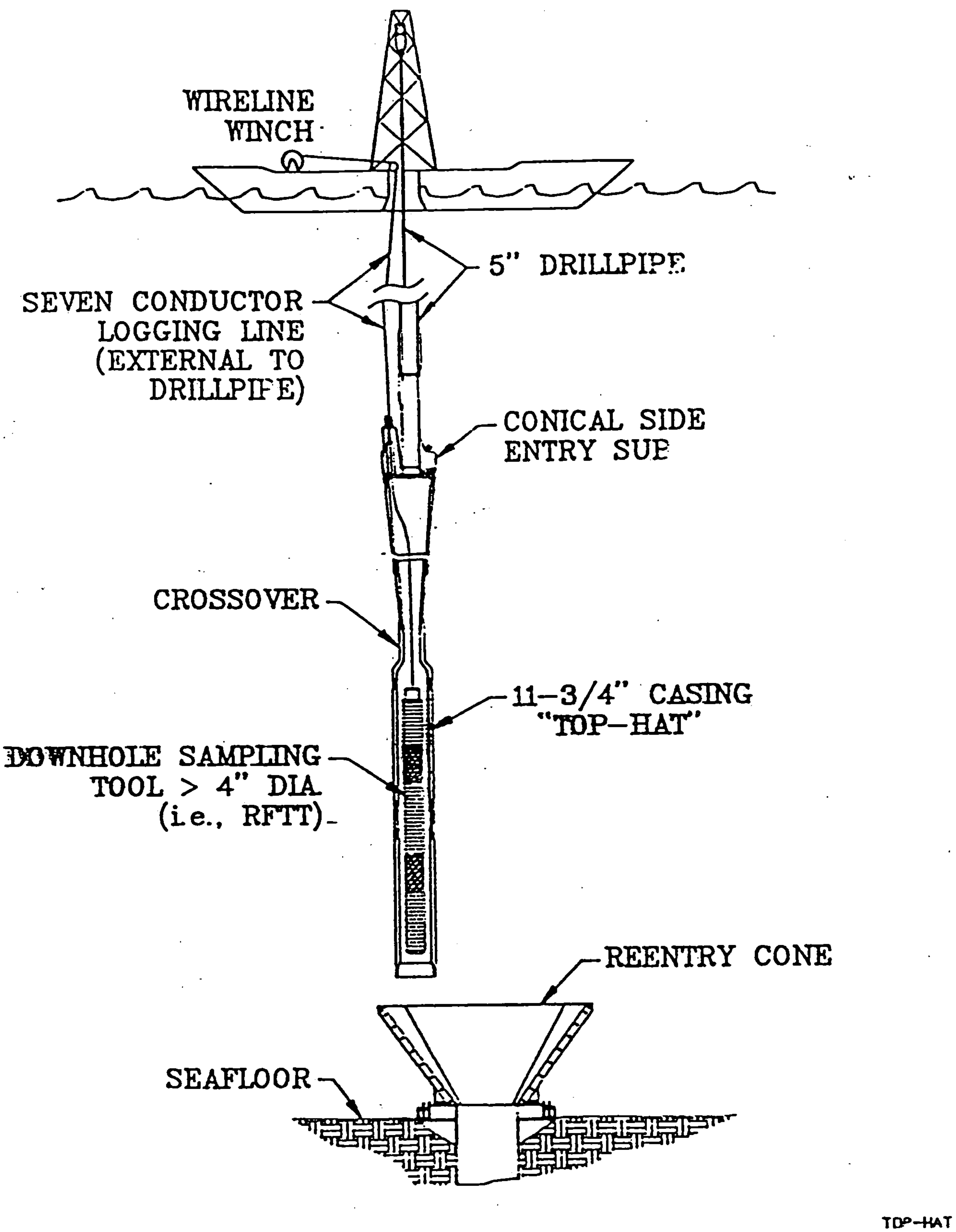

Figure 3

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FY1993 DOWNHOLE MEASUREMENTS PROSPECTUS FOR NORTH ATLANTIC DRILLING

Version 2, October 22, 1991

Table of Contents

Introduction

The contents of the North Atlantic Prospectus have been gleaned from the top-ranked proposals of the JOIDES thematic panels in accordance with global rankings completed at their spring, 1991 meetings. The primary purpose of the North Atlantic Prospectus is to assemble all known highly-ranked programs for work in the North Atlantic and adjacent oceans, in accordance with Year 1 of the 4-year plan passed by PCOM at its April, 1991 meeting in Narraganset, Rhode Island. The thematic panels are being asked to re-review and re-rank the proposal/programs in the Prospectus at their fall, 1991 meetings. The top candidates will then be considered by PCOM for inclusion in the drilling program for FY1993.

The downhole measurements prospectus is intended to provide a structure for development of the downhole measurements program on the North Atlantic drilling legs. Version 1 was given to DMP at its fall, 1991 meeting, for its input to insure that logging, particularly specialty tools, are included in the drilling program at the earliest possible stage of planning. Version 2 of this prospectus incorporates DMP's initial recommendations for all the North Atlantic proposals. Further drafts will be developed as they are needed by the planning process.

ODP Logging Tools

We assume that all of the tools currently used in ODP will be available for FY1993:

1) "Standard logs" (three strings):

a) "Quad " combo, or geophysical tool string - waveform sonic, spectral gamma ray, resistivity, density, neutron porosity, caliper and temperature (low T).

b) Geochemistry - spectral gamma ray, aluminum clay tool, gamma spectrometry, and temperature.

c) FMS - Formation MicroScanner, spectral gamma ray, and general purpose inclinometer;

2) Dual laterolog; A new digital version of this resistivity tool can be run as part of the "Quad" combo instead of the DITE induction tool normally run. High resistivity formations can now be logged without a separate logging run

3) Vertical seismic profile tool : 1-component; individual investigators may bring a 3-component tool

4) Digital borehole televiewer (BHTV);

5) Magnetometer/susceptometer;

6) Barnes water sampler/temperature/pressure.

High-temperature tools:

1) High-temperature temperature tool (500° C) and high-temperature cable (350°C);

2) High-temperature digital televiewer (300°C).

Additional tools with little or no prior ODP use that may be available in FY1993:

1) Fluid sampler (wireline packer ?);

2) Sandia high temperature fluid sampler

2) Lateral stress tool (LAST);

3) Morin/Becker flowmeter;

4) High-temperature resistivity tool.

5) Geoprops probe;

6) Soviet sonic array stress tool (SAST)

We occasionally include other tools in leg objectives and logging tool objectives sections, with assessments of whether the tools are likely to be available.

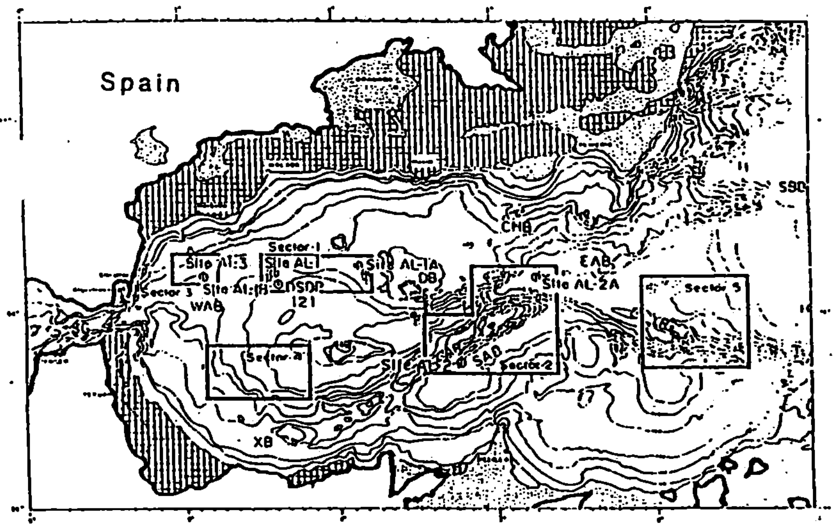
Alboran Basin and the Atlantic-Mediterranean Gateway

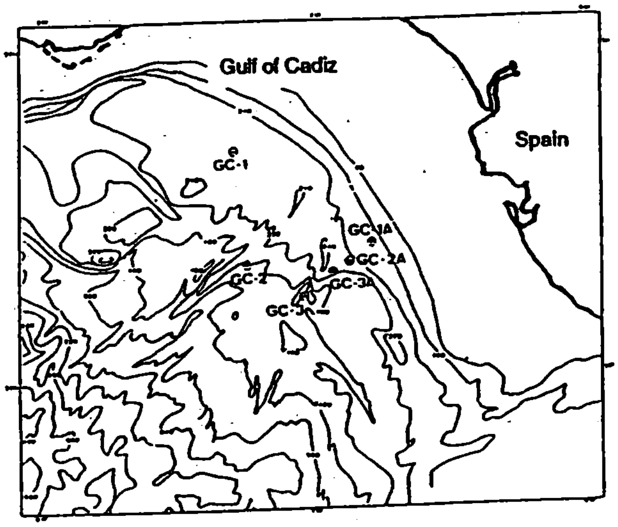
(Information from proposal 323-rev)

This program proposes to study deformation processes at convergent plate boundaries (Alboran Basin), and also reconstruct paleoceanographic changes in the Mediterranean gateway. The proponents are urging a two-leg program to drill the linked but distinctly different programs.

The proposal to examine Neogene evolution of continental basement overthrusting and extension in the Alboran Sea is aimed at understanding the deformation processes at convergent plate boundaries, as well as the dynamics of interaction of extensional and collisional structures.

The Atlantic-Mediterranean Gateway program intends to examine the Late Tertiary history of Atlantic-Mediterranean sea-level oscillations, water exchange and circulation patterns, and investigate the climatic signal in marginal ocean basins. The primary sites are in the Gulf of Cadiz (Atlantic Ocean), but the program also proposes to take advantage of the tectonic sites in the Alboran Basin (Mediterranean Sea) to constrain paleoceanographic reconstructions in the western Mediterranean - Atlantic region.





Site I.D.	Water Depth	Penetration Seds	Bsmt	Log Time (hrs) Std	BHTV	Fluids	Mag/Susc	Total days
Al-1	1036	3000	>50	60	3.9			2.7*
Al-1A	850	>2200	0	48				2.0*
Al-1B	925	1100	100	33	3.8			1.5*
Al-2	900	1500	0	39				1.6*
Al-2A	1773	1300	0	34				1.4*
Al-3	518	1400	0	35				1.5*
GC-1	550	600	0	23				1.0

GC-1A	350	>500	0	18	0.8
GC-2	570	>500	0	22	0.9
GC-2A	453	>500	0	23	1.0
GC-3	760	>500	0	22	0.9
GC-3A	500	>500	0	21	0.9

*Assumes Side Entry Sub needed at these sites

General Comments:

The proposal as presented contains significantly more than one ODP leg of drilling objectives. Sites have been prioritized, however, to show where the program might be cut. No new logging technology is needed to achieve program objectives.

Leg Objectives

Alboran Basin:

1) The nature and timing of vertical and horizontal displacements. Paleodepth indicators are large forams (cores) and sedimentary facies (cores, FMS, standard logs). Porosity and density from standard logs are useful for backstripping, decompaction.

2) Synchronous basin formation and sedimentation can be determined from continuous intersite correlation via standard logs.

3) Deformation structures. High-resolution structural dip, folding, tilting and delineation of fractures - all oriented - are possible with the FMS.

Mediterranean Gateways:

1) High-resolution paleoclimatology. Physical properties logs (velocity, density, porosity, and resistivity), as well as the high-resolution FMS will be used to detect high frequency variations at Milankovitch or higher frequencies.

2) Paleoproductivity of surface waters. Geochemical and physical properties logs for detecting changes in porosity (from faunal changes), and characterizing the transition from carbonate to siliceous sedimentation.

3) Establish environmental conditions immediately after the Messinian salinity crisis and after the opening of the Atlantic-Mediterranean gateway.

Logging Tool Objectives:

1. Standard logs (geophysical string, geochemical string, FMS): mineralogical variation as a function of time and location; synthetic seismograms for depth/seismic link; structure and deformation of sediments. Chances of success: very good. Hole conditions for logging will

probably be very good, although hole stability may become a problem in the deeper holes.

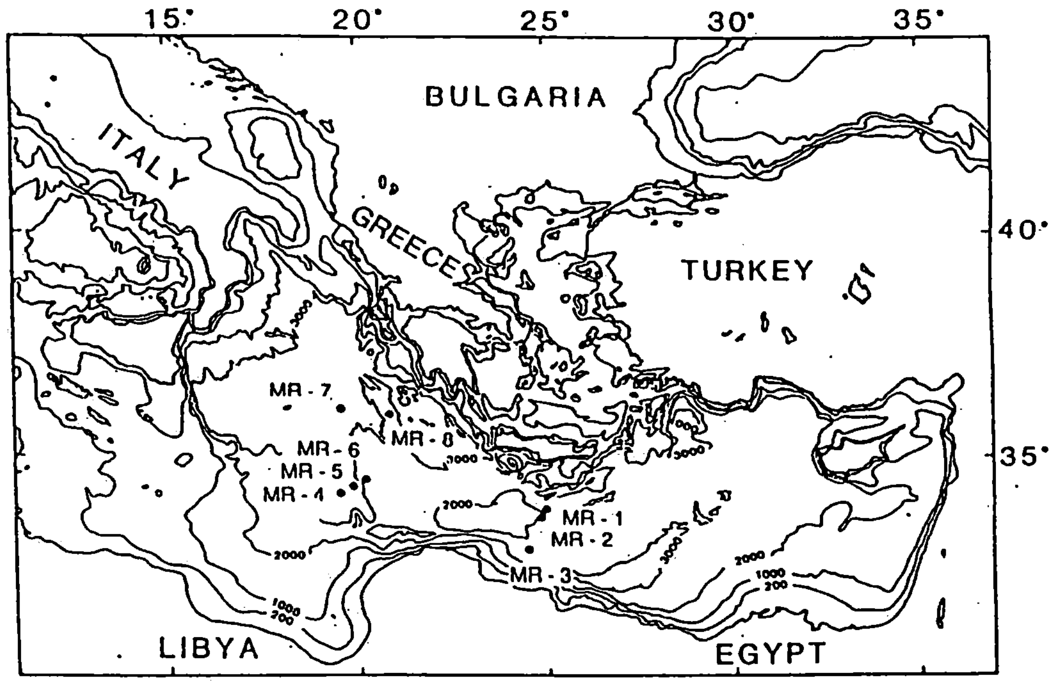
Need for New Logging Technologies:

High-resolution susceptibility tool desirable for correlation with measurements made on core.

Mediterranean Ridge

(Information from proposal 330)

The Mediterranean Ridge is an accretionary prism like the Nankai and Cascadia prisms, but is unique because it is underlain by continental instead of oceanic crust, and is in an incipient collisional context.



Site I.D.	Water Depth	Penetration Seds	Penetration Bsmt	Log Time (hrs) Std	BHTV	Fluids	Mag/Susc	Total days
MR-1	2200	1000	0	33		12		1.9*
MR-2	1900	200	0	21		7		1.2
MR-3	2600	1000	0	34		13		2.0*
MR-4	3900	2000	0	51		22		3.0*
MR-5	3200	1000	0	35		29		2.7*
MR-6	2780	150	0	22		17		1.6
MR-7	3100	150	0	22		18		1.7
MR-8	3100	1000	0	35		28		3.0*

*Assumes Side Entry Sub needed at these sites

General Comments

The downhole measurements requirements for this program are similar to those for the Cascadia Accretionary Prism drilling (Leg 146; see CEPAC Logging Prospectus, 1/14/91). As such, it will need a significant downhole measurement program to be successful. Many of the tools needed for fluid sampling and permeability measurements are still being developed and this program, if drilled, may be one of the early field deployments for them.

Leg Objectives

The major objective of drilling and logging the Mediterranean Ridge is to understand the geometry, kinematics, and mechanics of accretionary processes, with particular emphasis on pore-fluid distribution within the accretionary wedge.

1) Pore pressure, permeability, and fluid flow at a variety of scales. These measurements will be used for determining hydraulic conditions and fluid expulsion pathways. Measurement techniques will depend on depth: LAST at shallow depths, geoprops for intermediate depths, and wireline packer for greater depths.

2)Pore fluid composition,T as an indicator of pore fluid origin, diagenesis, and fluid sources. The Barnes/Uyeda tool can be used for shallow sediments , and geoprops or wireline packer for deeper sediments, and pressure core sampler at various depths.

3) Porosity, both intergranulary and fracture, for comparison with fluid-flow indicators and consequent evaluation of controls on fluid flow. Standard physical properties logs, and FMS.

4) Temperature, heat flow, and thermal conductivity, as indicators of fluid flow and nonlinear thermal gradients. Shallow heat flow measurements will be based on the Barnes/Uyeda probe. Continuous temperature logs, obtained from all logging tool runs, can be used to extrapolate equilibrium thermal gradients. Coupled with a thermal conductivity log from log-based mineralogy, the high-resolution thermal gradient log should detect nonlinear thermal gradients and all zones of active fluid flow.

5) Detailed variations in structural dip and fracture patterns. Obtainable with FMS.

6) Mineralogy, both for depositional history of the ridge, and because of the probable impact of mineralogy (especially clay content) on hydrology. Obtainable from standard logs.

7) Sedimentary facies, particularly identification of slumps and turbidites, for depositional and structural histories of the ridge. Obtainable from standard logs, including the FMS.

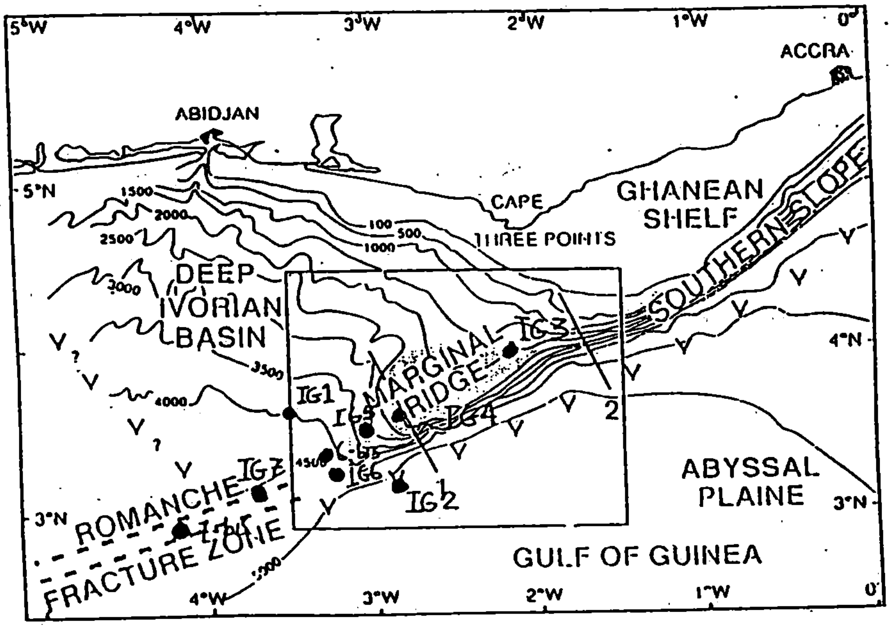
8) Stress and strain properties of sediments. Measurements of mechanical and stress state are needed to test models for the evolution of accretionary prisms. In situ measurements of stress and strain properties are possible only for APC cores, using the lateral stress tool (LAST). Maximum horizontal stress direction con be measured with FMS.

Need For New Logging Technologies

Several tools (wireline packer, geoprops, Navidrill, pressure core sampler) needed for this leg are still under development of have had limited success in the ODP. All will probably be tested in the ODP before this leg.

Eastern Equatorial Atlantic Transect
The Ivory Coast - Ghana Transform Margin
(Information from proposal 346-2)

Transform margins represent the third great category of continent-ocean boundaries but are still poorly understood and await exploration by scientific drilling. Drilling at a transform ("translational") continental margin is needed to understand at these margins the deformational history, vertical tectonics, and the structure of the continent-ocean boundary. A series of holes drilled along the Ivory Coast - Ghana Transform Margin will address how these margins evolve.



Site I.D.	Water Depth	Penetration Seds	Penetration Bsmt	Log Time (hrs) Std	BHTV	Fluids	Mag/Susc	Total days*
IG-1	4050	1000	100	38	5.8			1.8
IG-2	4935	1400	--	44				1.8
IG-3	2340	900	--	32				1.3
IG-4	2055	1200	--	35				1.5
IG-5	3300	900	100	35	5.2			1.7
IG-6	4650	200	200	29	6.5			1.5
IG-6bis	4320	1100	--	39				1.6
IG-7	4200	200	100	32	5.1			1.3
IG-7bis	4545	250	100	28				1.2

*assumes Side Entry Sub needed on all sites

General Comments:

Three or perhaps four re-entry holes have been proposed for this program. These and the proposed single-bit holes are substantially more than one ODP drilling leg. Logging is an integral part of the program to determine type and structure of sediments and basement and will most probably be the only means to assemble complete stratigraphic sections in the deeper holes, because of poor rotary-core sediment recovery.

Leg Objectives:

1. Transform margin evolution where both extensional and transform mechanisms are interfering

- *Nature of acoustic basement underlying marginal ridges generated at cont./oceanic crust boundary*

The standard logging suite (Geophysical string, Geochemical string, and FMS) will be instrumental to characterize the basement, especially in badly sheared sections where core recovery may be poor. Physical properties measured by logging will be instrumental for constructing synthetic seismograms to link the drill sites to the extensive multichannel seismic data for the surrounding region, while chemical information can be used to identify the types of rocks that make up the basement. FMS will be important to identify basement structure and modern stress directions. Borehole Televiewer logging of basement sections will give more complete hole coverage of basement structure than FMS and will also identify breakout zones caused by the modern stress regime.

- *Type of deformation on marginal ridge and lithology of sediments deposited during its creation*

FMS dipmeter information will be fundamental to identify deformation and to orient recovered core sections for shipboard structural analysis. Sediment lithology can be identified by the geophysical and geochemical logging data, even if core recovery is poor.

- *Results of thermal exchange between cont. and oceanic crust and effects on vertical movements along ridge*

Alteration of continental crust can be identified through changes in the physical properties of the continental material, while fluid exchange will manifest itself by cracks filled with alteration minerals (visible by FMS) or, if the alteration is pervasive, by changes in the bulk chemical properties measured by the geochemical tool string.

- *Timing, rate, and degree of vertical movement from successive onlaps/offlaps*

Logging will be fundamental in placing dated core material in the stratigraphic sequence drilled at each site, especially in intervals of poor core recovery. FMS data and physical properties data from logging will also be important for defining stratigraphic sequences.

- *Physical characteristics, deformation of sediment cover, and nature of basement involved in continent/continent transcurrent motion*

Stress and strain properties of sediments can be obtained with the LAST tool in APC sections. Maximum horizontal stress direction can be measured with the FMS or BHTV. Deformation of sediment cover and basement can be analyzed with FMS structural information, and with BHTV basement images.

- *Age, lithology/paleoenvironment, and diagenesis of different sed. units emplaced during margin evolution*

The ODP standard logging suite is optimally designed to provide information about paleoenvironment and diagenesis. Geochemical logs can be used to define different sedimentary units and to imply paleoenvironment. Physical properties measured by logging can be used to determine the amount of cementation or dissolution that has occurred. They can be also used to make synthetic seismograms to link the drilled sequence to the seismic reflection data for the margin. Finally, FMS can identify sedimentary structures and help identify paleoenvironmental conditions.

- *Consequence of sharp cont./ocean transition on nature of adjacent ocean crust (melting, erosion, underplating)*

FMS data can identify anomalous structures in the ocean crust, and anomalous magmatic events can be identified by their geochemical signature from the standard log suite. Physical properties measurements from the logs will identify anomalous fracture structure.

<u>2. Evolution of Central South Atlantic gateway in mid-Cretaceous and Cenozoic times</u>

- *Age, lithology, and paleoenvironment of oldest sediments resting on ocean crust*

The standard logging suite will provide the same information for the oldest sediments in the ocean sequence as it will provide for the sediments on the marginal ridge, as discussed above. In addition, in these deep sequences where core recovery will probably be 50% or less of the total section, The logging data will provide the only comprehensive information about these oldest sediments.

- *Sedimentation of specific facies during opening phase (especially Cenomanian-Turonian black shales*

Even though the logs don't directly measure organic carbon, organic matter-rich intervals can be identified by their high uranium contents and by anomalous physical properties. Logs will complement core by identifying the number and thickness of black shale sequences even when core recovery is poor.

- *Cenozoic large scale hiatuses, history of deep water circulation, and climatic fluctuations.*

Logging data can be used to reconstruct the seismic signature of large-scale hiatuses identified in core material, and thus will be used to link core measurements to seismic stratigraphy. In addition, Milankovitch-scale climatic fluctuations typically are evidenced by periodic variations in physical/chemical properties of the sediments, detectable by logging.

Logging Tool Objectives:

1. Standard logs (geophysical string, geochemical string, FMS): mineralogical variation as a function of time and location; synthetic seismograms for depth/seismic link; nature of basement; structure and deformation of sediments and basement. Chances of success: very good. Hole conditions for logging will probably be very good, since synrift sands, if found, should be well-lithified.

2. Borehole televiewer: Structure and fracture patterns of basement sequences, modern stress directions. DMP views that the additional structural information obtained by BHTV over FMS (360° acoustic image in the BHTV versus FMS resistivity images of about 1/3 of the borehole circumference) to be important for identifying basement structures and fracture patterns, and to identify the modern stress environment via borehole breakouts. All significant basement sections are planned for BHTV logging.

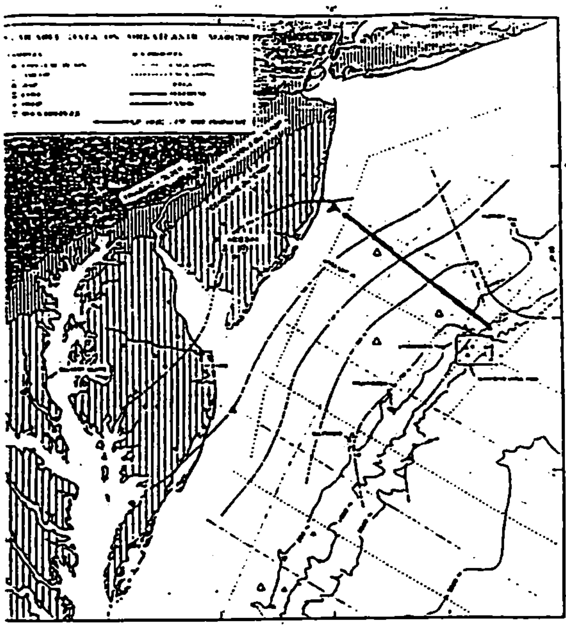
Need for New Logging Technologies

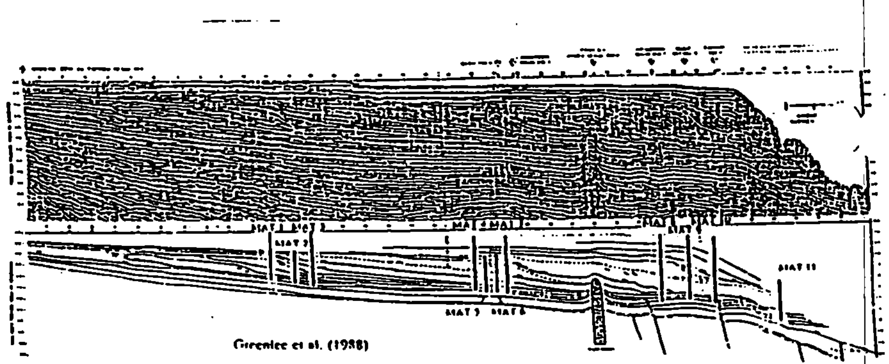
None

New Jersey Sea Level

(Information from proposal 348-add)

Past fluctuations of global (eustatic) sea level have had a profound impact on a wide range of disciplines within the earth sciences, yet the timing and magnitude of eustatic changes is not very well constrained or even understood. At a JOI/USSAC sponsored workshop entitled "The Role of ODP Drilling in the Investigation of Global Changes in Sea Level", a consensus emerged that global sea level is a topic that needs to be built upon with a thorough, publicly available data base. A checklist for selecting passive margin transects for relative sea level changes was established at this workshop. The middle Atlantic margin ranked high on the criteria list. The Workshop also recommended that data collection should concentrate on a period when glacio-eustatic changes (known mechanism and high amplitude) were clearly operating during the Oligocene to Miocene (the "ice-house world").





Site I.D.	Water Depth	Penetration Seds	Penetration Bsmt	Log Time (hrs) Std	BHTV	Fluids	Mag/Susc	Total days
MAT1*	50	788		25				1.1
MAT2*	50	788		25				1.1
MAT3*	50	831		26				1.1
MAT4	100	831		26				1.1
MAT5	100	875		27				1.1
MAT6	100	875		27				1.1
MAT7	100	910		27				1.1

*Drilling these sites will not be possible with the JOIDES Resolution.

Site I.D.	Water Depth	Penetration Seds	Bsmt	Log Time (hrs) Std	BHTV	Fluids	Mag/Susc	Total days
MAT8	180	1050		27				1.1
MAT9	180	1050		27				1.1
MAT10	180	1050		27				1.1
MAT11	1000	1050		30				1.3

Leg Objectives

The program aims to determine changes in relative sea level recorded in passive margin sediments by the following:

1) extending the DSDP transect on this margin onto the upper slope and continental shelf. Standard logs will provide continuous intersite correlation.

2) determining the geometry and age of Oligocene to Miocene depositional sequences by correlating core with regional seismic lines. Velocity and density logs will provide a link between core depth and seismic traveltime through a synthetic seismogram. The geometries of depositional sequences are governed by depositional environments, which can inferred from FMS data.

3) evaluating the role of relative sea level changes in developing a sedimentary record. Changes in facies, particular turbidite deposition, can be determined by logs that measure physical properties. These logs will be invaluable in delineating changes in grain size and (indirectly) in lithology. Geochemical logs will be very important for determining lithology because core recovery in coarse-grained intervals will be low. Porosity logs will be used in the calculation of compaction and loading on the margin, in order to determine the role of subsidence in generating relative sea level change.

4) evaluating the possible causal link with ice-volume (glacio-eustatic) changes by studying the temporal and lateral changes in deposition.

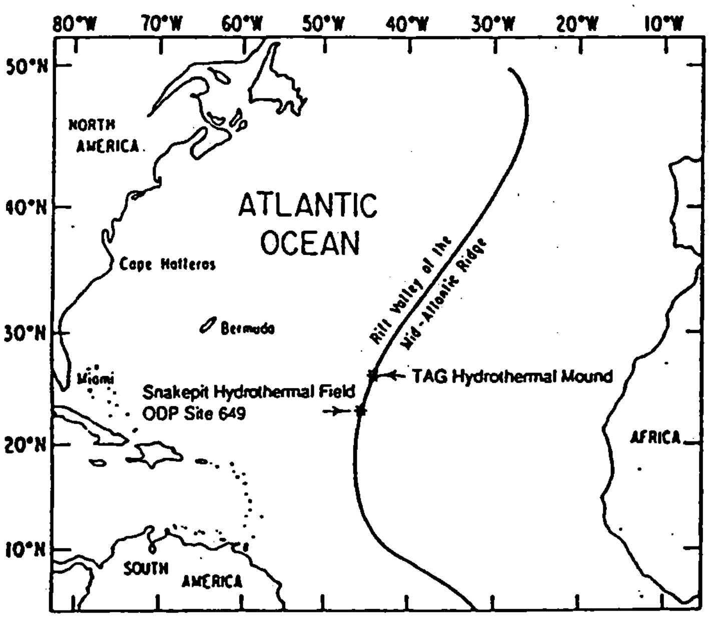
Need for New Logging Technologies:

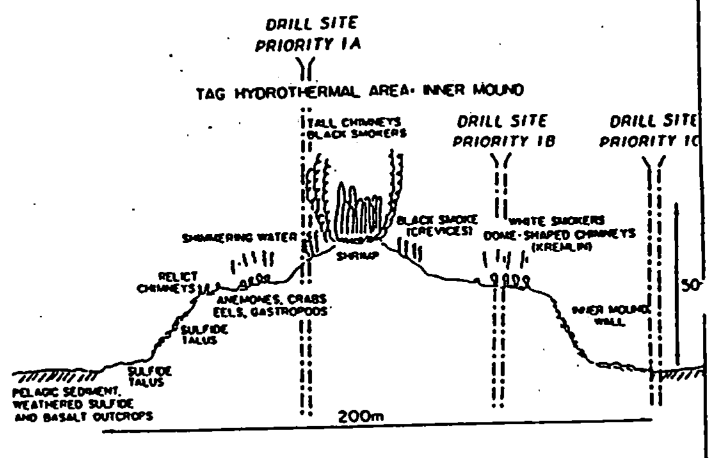
High-resolution susceptibility tool desirable for correlation with measurements made on core.

Drilling Active Hydrothermal Systems, TAG Hydrothermal Field, Mid-Atlantic Ridge 26°N

(Information from proposal 361-Rev)

The TAG hydrothermal field is an extensive, well-surveyed hydrothermal field on slow-spreading ocean crust. It appears to be an active analogue to the Troodos volcanic-hosted massive sulfide deposits. As such it presents an excellent opportunity to study the structure, geology, and tectonics of a modern volcanic-hosted sulfide deposit, as well as to study the dynamics of sulfide deposition and physical characteristics of fluid flow in these systems. Because the system is active, it also presents a severe technical challenge for downhole measurements.





Site I.D.	Water Depth	Penetration Seds	Penetration Bsmt	Log Time (hrs) Std[1]	Fluids[2]	Packer[3]	T/flow[4]	Total days
PRI-1A	3700	--	300	25.7	11.2		6.0	1.8
PRI-1B	3700	--	300	25.7	11.2		6.0	1.8
PRI-1C	3700	--	300	25.7	11.2		6.0	1.8
PRI-2	3700	--	600	30.0	13.0		8.0	2.1
PRI-3	3700	--	2000	50.3	42.7	52	17.4	6.8
PRI-4	3700	--	1000	35.8	30.7	50	10.7	5.3

(1) assumes side entry sub needed for hole cooling, and that holes can be cooled to <150°C

(2) assumes 3 sample runs in holes < 1km; 6 in holes > 1km

(3) assumes 1 pipe trip for each packer emplacement, 2 placements per hole shown

(4) time allotted for 1 high temperature T profile, with flowmeter.

General Comments:

The drilling program at the TAG hydrothermal field is meant to occupy more than one leg -- each priority is roughly one leg of drilling. Technical challenges for downhole measurements will be similar to those faced by the Leg 139 Sedimented Ridge Hydrothermal Drilling, with the exception that the Diamond Coring System may be employed for some or all holes in this program. DCS drilling will limit the downhole measurement program to measurement of fluid temperature and flow, and resistivity. Design of the downhole experiments to study fluid flow should take into account the experience of both 504 B and Leg 139 -- that drilling a hole in an advective system significantly changes the hydrologic regime. Drilling is an active hydrologic experiment, not a means to measure flow in the undisturbed system. For this reason, DMP recommends that these holes be made capable of re-entry and, if possible, be sealed for future studies on the dynamics of an undisturbed system.

Project Objectives:

1. *Nature/distribution of deposits in near-surface discharge zone; dynamics and physical characteristics of flow (1st priority).*

Logging and other downhole measurements will be extremely important in understanding both the nature of the mineral deposit itself and its elationship with the host rock, and for understanding fluid flow within the deposit. Provided that holes can be cooled and are of sufficient size (i.e. DCS holes are reamed) the standard ODP logging suite will provide a variety of useful information. Within the sulfide deposit the resistivity logs and FMS resistivity imaging can be used to estimate the extent of mineralization and to locate fra tures cemented with high resistivity minerals such as the carbonates orite. Open fractures can also be identified on FMS images by their resistivity characteristics. Geochemical logs will provide another means to estimate the extent of mineralization, and the geophysical logs will provide small scale porosity information. The slimhole, high-temperature resistivity tool will be used if the holes are drilled with the Diamond Coring System, and cannot be reamed for logging.

If the host rock is badly brecciated, information about the basalt/sulfide contacts may come only from the logs. Velocity and porosity data from the standard logging suite will measure the extent of wallrock alteration, while FMS will image fractures, mineralization and original structure. Geochemical logs will also determine the extent of alteration in each of the holes.

Fluid flow measurements, with either the low temperature Becker/Morin flowmeter or a high temperature tool, like the JAPEX tool, are needed to understand the permeability structure of the mineral deposit. High temperature fluid sampling capability is a necessity.

2. *Nature/distribution of subseafloor mineralization stockwork/root zones; characteristics of circulating fluid (2nd priority)*

High temperature logging of temperature, combined with fluid sampling capability is needed to achieve this objective. Measurements of porosity by standard logging tools (provided that holes can be cooled) and measurements of structure via FMS and chemistry via the geochemical tool string will be instrumental for understanding alteration processes and mineral deposition in the stockwork zone.

3. *Nature and characteristics of the reaction zone (3rd priority).*

As above, standard logs will provide information about structure (FMS), fracture porosity (FMS, resistivity), alteration of basaltic host rock (density, velocity, chemical composition), and identify mineralized zones (resistivity, chemical composition, density, velocity). High temperature fluid sampling and temperature measurement are needed prior to hole cooling to get information about fluid composition in the system. Provided that the hole can be cooled, packer emplacements will give necessary permeability information for the reaction zone and shallower.

4. *Nature and characteristics of the recharge zone (4th priority).*

Structure, fracture locations, and fracture porosity can be derived from the standard logs, while packer emplacements will define permeability.

Logging Tool Objectives:

1. Standard logs (geophysical string, ge ochemical string, FMS): Mineralogical variation through the massive sulfide section and in the altered stockwork and reaction zones. Fracture spacing, directions, and mineral in-filling. Structure of the stockwork, reaction zone, and unaltered basalt crust. Chances of success: good. Failure of the standard logging program may occur if holes cannot be cooled below 150°C, or if holes are DCS-drilled without reaming to a size larger than the Schlumberger tools.

2. High-T temperature/fluid flow/fluid sampling: Fluid temperature, flow, and composition in a volcanic-hosted massive sulfide deposit. Chances of success: very good. All of these components have been used in high temperature regime on leg 139. An improved wireline High-T temperature/fluid sampler could be developed to better sample annulus fluids.

3. Packers (drillstem; single and straddle): Permeability of ocean crust in recharge zone and through a ridge crest hydrothermal system. Chances of success: good, if holes can be cooled sufficiently for successful packing with higher-T packer elements. Hole cooling may fracture hot rock, however, and change the permeability structure.

Need for New Logging Technologies

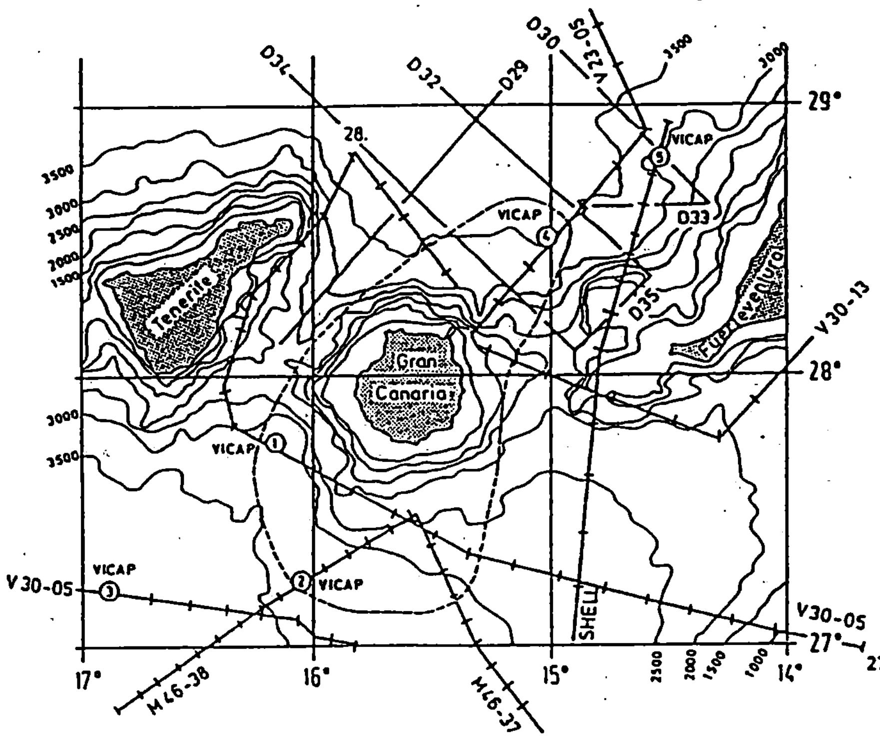
A wireline high-T temperature tool/fluid sampler would provide the best chance to sample uncontaminated hydrothermal fluids. The present Los Alamoshigh-T fluid sampler leaks, but a new sampler design using explosive valve seals may surmount this problem. In addition, this tool could be made in a slim-hole design, to work in DCS holes. Slimhole high-temperature logging tools are needed if DCS becomes the standard drilling procedure for bare rock sites. Increase in operating temperature range for packers is needed for the best permeability measurements in hydrothermal systems.

VICAP Gran Canaria

(Information from proposal 380-Rev2)

The purpose of this project is to study the physical and chemical evolution of a confined system (asthenosphere-lithosphere-seamount-volcanic island-clastic apron-sedimentary basin) by drilling into the proximal, medial and distal facies of a volcaniclastic wedge.

The Gran Canaria island is unique among volcanic islands in that it has experienced high degrees of differentation of magmas during several distinct stages. Determining the geochemical evolution of the ocean island will provide insights into mantle dynamics and evolution.



Site I.D.	Water Depth	Penetration Seds	Penetration Bsmt	Log Time (hrs) Std	BHTV	Fluids	Mag/Susc	Total days*
VICAP-1	3200	~900	0	33				1.4
VICAP-2	3400	~500	0	28				1.2
VICAP-3	3600	~800	0	32				1.3
VICAP-4	3400	~500	0	27				1.1
VICAP-5	3100	1250	0	43				1.8
MAP-1	5400	580	50	23	6.0			1.2

*Assumes Side Entry Sub needed at all sites

Leg Objectives

1) Total volumes of clastic contibutions. The three-dimensional growth of the clastic apron through time can be modelled on the basis of physical properties logs, and ages determined from

cores. Linear sedimentation rates between fixed age control points can then be corrected for compaction effects, and a time-dependent bulk accumulation rate can be established.

2) High resolution paleomagnetics of the clastic apron. The French magnetometer,which is scheduled for deployment on Leg 145 (North Pacific Transect) could be deployed in the sediment sections. With the correlation of biostratigraphic data to the paleomagnetics, the proponents hope to detail the island and basin evolution in time slices as detailed as 100,000 years.

3) Geochemical evolution of the volcanic island. Continuous geochemical logs will be used to determine changes in the chemical composition of the volcanic island, particularly between the initial seamount phase, which comprises ca. 95% of the volume of the island, and the subaerial portion of the island.

4) Enhanced levels of stress due to volcanic emplacement. The borehole televiewer (or FMS) can be used to record the orientation of wellbore breakouts to determine the direction of maximum horizontal compressive stress.

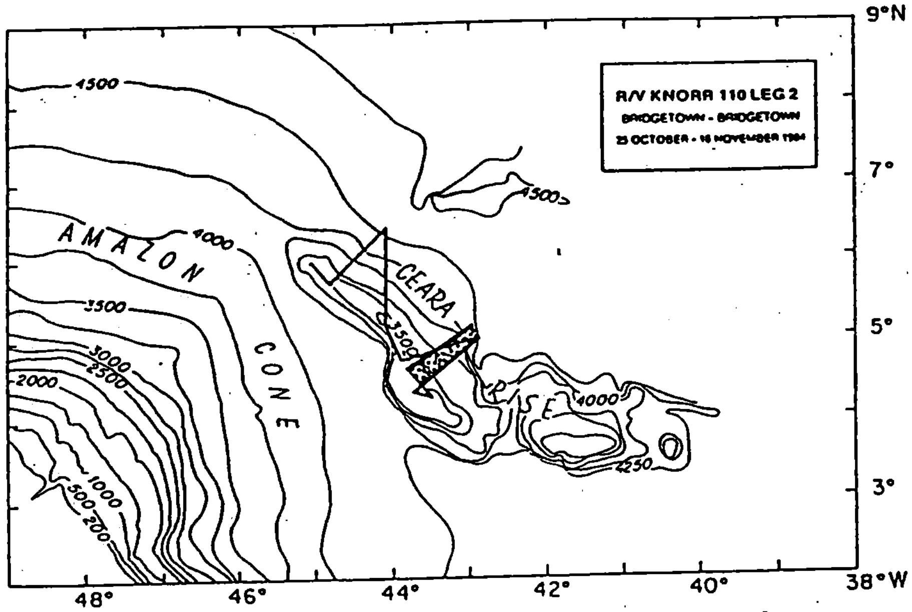
5) Paleoceanographic and -bathymetric reconstructions by identification of dissolution interfaces. FMS would be useful for refined delineation of volcanic units; continuous geochemical logs would delineate changes due to alteration, diagenesis, and facies change.

6) Correlation of turbidites to relative sea level changes and volcanic activity. Delineation of turbidites by the high-resolution FMS, and by physical properties logs (i.e. resistivity, sonic, density) will help to compensate for the anticipated low recovery in coarse-grained turbidite intervals.

Ceara Rise

(Information from proposal 388 and 388-add)

The major focus of this proposal is to obtain a depth transect of sites in order to reconstruct the Cenozoic history of deep water chemistry, carbonate production and dissolution, and deep water circulation. The advantage of the Ceara Rise is that deposition during the last 10 million years has been virtually continuous, and sedimentation rates are high enough to ensure that high-resolution time series of sedimentological and geochemical data can be produced.



Site I.D.	Water Depth	Penetration Seds	Penetration Bsmt	Log Time (hrs) Std	BHTV	Fluids	Mag/Susc	Total days
CEA1*	2800	800		31				1.3
CEA2	3050	200		23				1.0
CEA3	3300	200		24				1.0
CEA4*	3550	800		33				1.4
CEA5	3800	200		25				1.0
CEA6*	4000	800		34				1.4
CEA7	4200	200		26				1.1
CEA8*	4450	800		22				0.9

* These sites will be cored with the Extended Core Barrel to refusal, which is estimated to be at 800 meters below sea floor.

Leg Objectives

1) The history of deep water flow in the Atlantic during the Cenozoic by studying the relationship between deep water circulation, chemistry, and earth's climate.

2) Temporal changes in carbonate dissolution along the transect. Continuous intersite correlation via standard logs will yield continuous records of differential sedimentation rates. If slumping has occurred at any of the sites, the intersite correlation will reveal the anomaly. The FMS in particular, will be able to detect any slumped intervals and prevent possible misinterpretation of core data from such intervals.

3) Cenozoic history of surface water and climate can be addressed by continuous standard logs to detect any fluctuations in faunal abundance (as a function of porosity) at high frequencies (Milankovitch) or from changes in location or intensity of surface water productivity.

Need for New Logging Technologies:

High-resolution susceptibility tool desirable for correlation with measurements made on core.

Mediterranean Sapropel Drilling

(Information from proposal 391)

The accumulation of organic matter-rich sapropelic deposits in the eastern Mediterranean occurred in response to unusual, very distinctive changes of the physical circulation and chemical cycling of the Mediterranean Sea. This proposal aims to use geochemical information from APC sediment cores to investigate whether high primary productivity or bottom water anoxia was the primary cause for formation of the sapropels. No specific targets for drilling have been identified in this proposal.

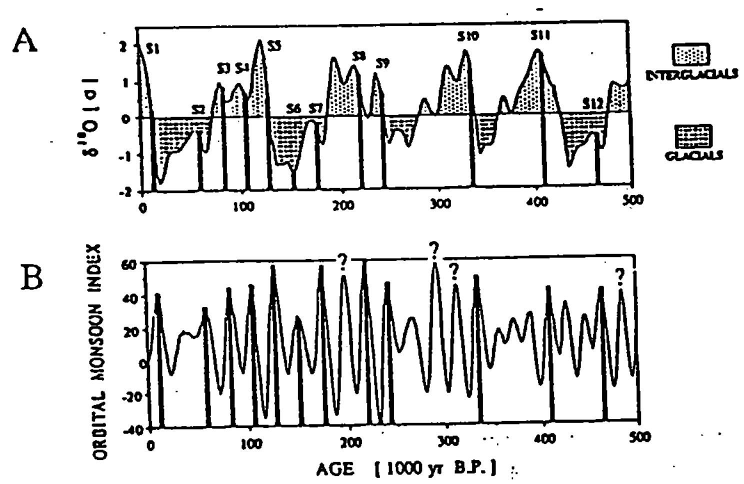


Figure 1. (A) Stratigraphic position of eastern Mediterranean sapropels S1-S12 in the Specmap global mean oxygen isotope record. (B) Distribution through time of the sapropels compared to the orbital monsoon index *sensu* Rossignol-Strick (1983).

No Specific Drill Sites Identified

General Comments:

The idea behind this proposal is to encourage APC drilling along transects in the eastern Mediterranean drilled primarily for tectonic studies (e.g. proposals 330/A and 379/A), though they also suggested that DSDP Sites 374, 377, and 378 are likely candidates for this program. A cursory examination of the DSDP Site Reports shows that each DSDP Site may prove deficient for further high-resolution drilling. We assume that site(s) drilled for this proposal will be approximately 150 meters deep.

Leg Objectives:

1. *Long-term history of sapropel formation in relation to state of global climate and orbital insolation parameters*

Logging can provide the background information needed for high resolution paleoceanographic studies, as demonstrated recently on Leg 138. Comparison of density logs (part of the standard logging suite) to shipboard GRAPE density allows assessment of and correction for the sediment distortion caused by coring. On Leg 138, composite sediment sections from recovered core were typically 10-15% longer than the length of section drilled. Logs are being used to correct the distortion by giving depths to the bulk density stratigraphy.

In addition, physical properties and geochemical properties measured by the standard logging suite also respond to Milankovitch orbital forcing and provide the context to assess conditions for sapropel formation. Sapropels should also have abnormally high water contents and high uranium contents when compared to normal sediments, and can be identified by geochemical logging and FMS logging even below the APC-cored interval where core recovery may be poor.

2. *Contribution of marine vs terrestrial sources to the organic fraction of the sapropels*

No logging input

3. *Water column redox conditions and productivity levels during sapropel formation.*

Geochemical logs can be used to measure the amount of carbonate and estimate the amount of opal in the sedimentary section. Variations in burial rates of different biogenic sediment fractions can help to assess the level of productivity at times of sapropel formation.

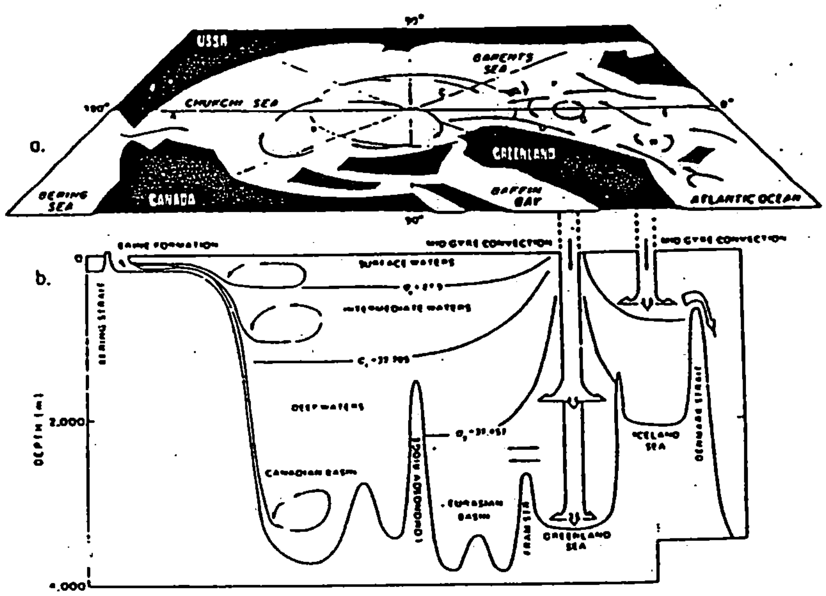
Need for New Logging Technologies

High-resolution susceptibility tool desirable for correlation with measurements made on core.

North Atlantic-Arctic Gateways Drilling

(Information from NAAG DPG report)

Drilling in the high-latitude North Atlantic Ocean and gateways to the Arctic Ocean is highly important for understanding the change from a relatively warm, ice-free world to the present condition where ice dominates the polar regions. The two legs of drilling in the NAAG are also needed for reconstructing the temporal and spatial variability of the oceanic heat budget and for understanding ocean circulation and climate change in a warm ice-free ocean.



Site I.D.	Water Depth	Penetration Seds	Std	Log Time (hrs) BHTV	Fluids	Mag/Susc	Total days
LEG 1							
YERM-1	900	700	36.4				1.5
ALT: YERM-2	1900	700	38.6				1.6
YERM-4	600	500	31.4				1.3
ALT: YERM-3	975	500	32.2				1.3
YERM 5	2850	600	38.6				1.6
? ARC-2A	3500	800	44.3				1.8
FRAM-1B	2500	810	42.4				1.8
ALT:FRAM-1A	2590	675	39.6				1.7

Site I.D.	Water Depth	Penetration Seds	Std*	Log Time (hrs) BHTV	Fluids	Mag/Susc	Total days
EGM-2	3400	750	43.0				1.8
ALT: EGM-1	3250	900	46.0				1.9
OR							
GREEN-2	2500	800	42.1				1.8
ALT: GREEN-1	1600	500	33.6				1.4
ALT: EGM-3	2650	900	44.7				1.9
EGM-4	1500	800	39.9				1.7
ICEP-4	1800	520	34.5				1.4
LEG 2							
FRAM-2	1290	360	29.9				1.2
GREEN-2	2500	800	42.1				1.8
ALT: GREEN-1	1600	500	33.6				1.4
ALT: EGM-3	2650	900	44.7				1.9
OR							
EGM-2	3400	750	43.0				1.8
ALT: EGM-1	3250	900	46.0				1.9
ICEP-1	1950	300	30.0				1.3
ALT: IP-2	2000	550	35.6				1.5
ICEP-2	3250	900	40.5				1.7
ICEP-3	2807	300	31.9				1.3
NIFR-1	2000	1000	45.4				1.9
SIFR-1	1500	500	33.4				1.4
DST-1	2500	500	35.6				1.5
ALT: DENS-1	2500	800	42.1				1.8

*assumes Side Entry Sub used on all logging and standard geophysical, geochemical, and FMS strings

General Comments:

The drilling plan for the two legs of NAAG drilling is highly flexible, to take into account that certain sites may only be drillable for a very brief period of time and certain sites may not be reached in a bad ice year. The standard (geophysical, geochemical, and FMS tool strings) ODP logging suite is planned for all holes.

Program Objectives:

1. *High northern-latitude oceans' role in global climate and ocean circulation*
  - evolution of surface watermasses and fronts
  - evolution of sea-ice cover
  - opening of gateways
  - deep water evolution
  - history of ice cover on surrounding continents
  - sediment budgets and fluxes

The ODP standard logging suite is highly suited to achieving the goals of this two-leg paleoceanographic program. Shipboard logs provide a rapid means to correlate between holes. Logging can also provide the background information needed for high resolution paleoceanographic studies, as demonstrated recently on Leg 138. Comparison of density logs (part of the standard logging suite) to shipboard GRAPE density allows assessment of and correction for the sediment distortion caused by coring. On Leg 138, composite sediment sections from recovered core were typically 10-15% longer than the length of section drilled. Logs are being used to correct the distortion by giving depths to the bulk density stratigraphy.

In addition, most of the physical and geochemical properties measured by the standard logging suite respond to Milankovitch orbital forcing and provide the means to assess climate cycles even in poorly-recovered sedimentary sections. FMS images will also be used for fine-scale sedimentary studies, and can image dropstones in the borehole wall as an indicator of sea-ice.

Logging Tool Objectives:

1. Standard logs (geophysical string, geochemical string, FMS): mineralogical variation as a function of time and location; synthetic seismograms for depth/seismic link; structure and deformation of sediments. Chances of success: excellent. Holes for this study avoid sandy sediments which may cave or collapse the drill hole.

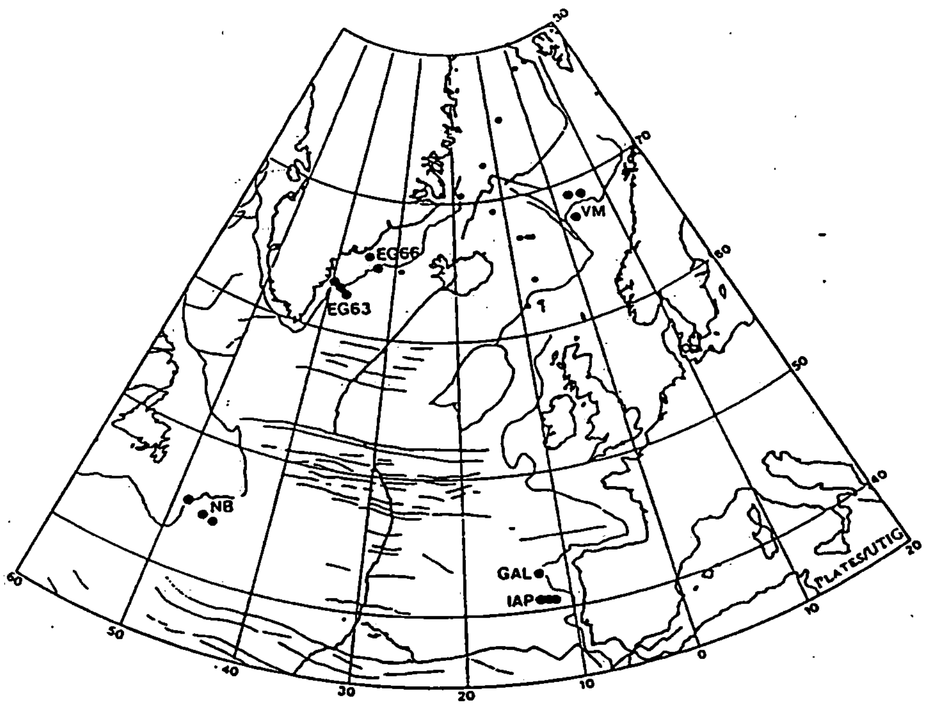
Need for New Logging Technologies

High-resolution susceptibility tool desirable for correlation with measurements made on core.

Drilling North Atlantic Rifted Margins

(Information from NARM DPG report)

Development of rifted continental margin models by extrapolating continental rift models to higher degrees of crustal thinning has proven to be a gross oversimplification, at best, of actual rift processes. The NARM drilling program is designed to compare quantitative results on deformation style and rate, early volcanic productivity and spreading rate, mantle temperatures and magmatic melt histories, and subsidence histories from the two most contrasting types of rifted margins: 1) the thick-crusted volcanic margin, and 2) the thin-crusted, multi-rift, non-volcanic margin.



Site I.D.	Water Depth	Penetration Seds	Penetration Bsmt	Log Time (hrs) Std	Log Time (hrs) BHTV	Log Time (hrs) VSP	Mag/Susc	Total days
VOLCANIC MARGINS								
LEG 1								
EG63-1	520	440	500	29	7.3			1.5
EG63-2	1875	1220	500	43	8.9			2.2
LEG 2								
VM-3	1370	470	800	35	11.2			1.9
VM-5	3180	470	400	33	8			1.7
VM-6	3370	600	50	30				1.3

*assumes Side Entry Sub needed on all holes

Site I.D.	Water Depth	Penetration Seds	Bsmt	Log Time (hrs) Std	BHTV	VSP	Mag/Susc	Total days*
NON-VOLCANIC MARGINS								
LEG 1								
IAP-4	5400	680	100	36				1.5
IAP-2	5200	850	100	38	6.4	16.5		2.5
GAL1	4500	550	100	32				1.3
IAP-3B	5500	850	100	39				1.6
LEG 2								
NB-4A	3940	2250	200	57	8.1	15.7		3.4

*assumes Side Entry Sub needed on all holes

General Comments:

The drilling indicated in the legs listed above is based upon the latest recommendations of the Tectonics Panel and Lith Panel. The non-volcanic margin leg 1 was rated highest priority by Tectonics Panel. IAP-3B will function as an alternate site, if other drilling objectives are reached.

Program Objectives:

In each of the programs below, the standard ODP logging suite will suffice for most of the downhole measurements needed. Borehole televiewer information will be important to study structure in the basement sections of some of the drillholes, however, and vertical seismic profiles may be needed for deep seismic structure in some of the Iberian Abyssal Plain holes, particularly if the holes fail to reach their deep objectives.

Standard logs will provide density and velocity information to make synthetic seismograms for comparison with the extensive seismic reflection data collected around all the sites. Geochemical logs will provide sufficient chemical data to discriminate between sediment types, major classes of volcanic rocks, and to identify alteration. Logging data from the standard suite will also provide means to correlate between holes. FMS, from the standard logging suite, and BHTV will image fractures and identify other strain features in the lithologic column. They will also be used to orient fracture directions.

VOLCANIC MARGINS

1. SE Greenland Transect (EG-63)

- constrain Seaward Dipping Reflector Sequence (SDRS) emplacement mechanism
- temporal development of volcanism
- vertical and horizontal accretion rates

- geochemical composition and variation across archtypical SDRS
- syn-constructional flexure, strain rate, and subsidence; post-constructional subsidence
- Influence of Iceland Hotspot on rift volcanism

2. Vøring Margin Transect (VM)
- timing of volcanism with respect to breakup process, and transient nature of volcanism
- testing for possible margin assymetry
- conditions governing lateral variation in vertical motion of the igneous complex

NON-VOLCANIC MARGINS

3. Iberia Abyssal Plain (IAP)
- corroboration of geophysically-based predictions for the Ocean-Continent Transition (OCT)
- existence of peridotite ridge associated with OCT
- age and subsidence history of sediments overlying the westernmost tilted continental block
- nature and composition, and rift-related alteration of the westernmost tilted continental block

4. North Newfoundland Basin (NB-4A)
- nature and age of basement
- nature and age of synrift 'fill'
- nature (e.g. subaerial erosion) and age of breakup unconformity
- gateway paleoceanographic history
- sea-level record of adjacent Grand Banks
- History of abyssal circulation in gateway between northern and central North Atlantic Basins

Logging Tool Objectives:

1. Standard logs (geophysical string, geochemical string, FMS): mineralogical variation as a function of time and location; synthetic seismograms for depth/seismic link; structure and deformation of sediments. Chances of success: very good in shallow holes, good in deeper holes. Hole stability may be a problem in the >2 km holes.

2. Borehole televiewer: Structure and fracture patterns of basement sequences, modern stress directions. DMP views that the additional structural information obtained by BHTV over FMS (360° acoustic image in the BHTV versus FMS resistivity images of about 1/3 of the borehole circumference) to be important for identifying basement structures and fracture patterns, and to identify the modern stress environment via borehole breakouts.

3. Vertical Seismic Profile: Depth to thinned continental block, if holes cannot reach deep objectives; structure within thinned continental block. Chances of success: very good.

4. Lateral Stress Tool (LAST): In-situ variations in stress within sediment packages to determine lateral variations across the margin.

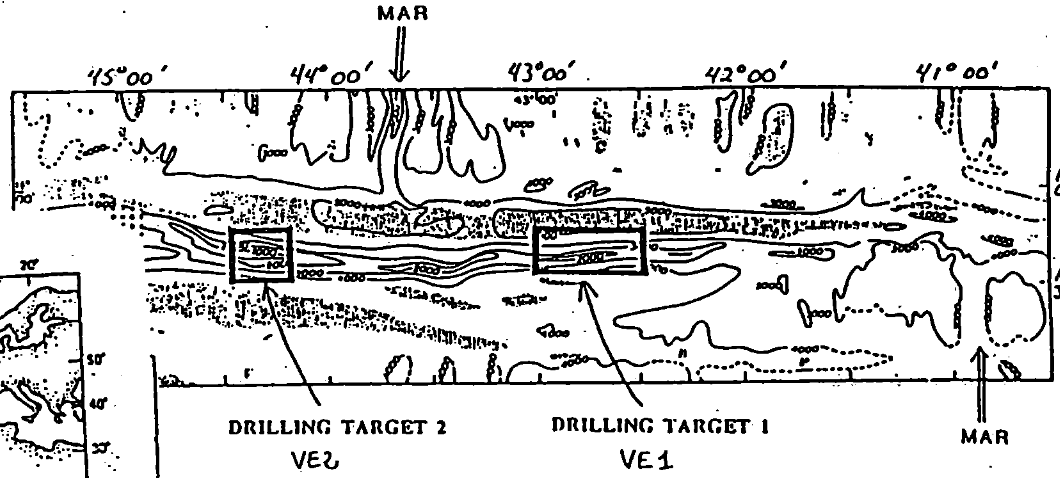
Need for New Logging Technologies

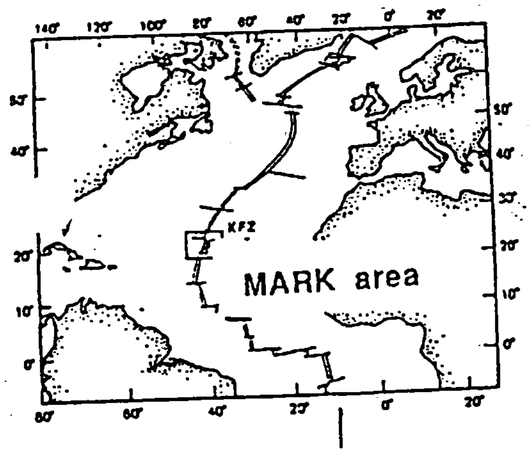
None

Offset Drilling to Study the Oceanic Lithosphere

(Information from Offset Drilling Working Group preliminary report and from proposals 369-rev and 376-rev)

Drilling offset partial segments of tectonically exposed deep crust and shallow upper mantle is a relatively new strategy to recover complete sections through the ocean crust and upper mantle by drilling relatively shallow holes (500-1000 m). Two sites in the Atlantic Ocean, the MARK area and the Vema Fracture Zone, have gabbro or peridotite sections targetted for drilling in this program.





Site I.D.	Water Depth	Penetration Seds	Bsmt	Std	Log Time (hrs) BHTV	Fluids	Mag/Susc	Total days
369-rev								
MK-1	2500	--	1000	29	8.9		7.7	1.9
MK-2	3500	--	1000	31	11.4		8.4	2.1
376-rev								
IG-3	3500	--	1000	31	11.4		8.4	2.1
IG-4	580	200	10*	14			--	0.7

* to bit destruction.

General Comments:

The Offset Drilling Working Group has not yet had the time to prioritize Atlantic sites nor to develop a complete Offset Drilling program encompassing all of the ocean basins. In whatever holes drilled in this program the standard logging suite will constrain structure and chemical composition of the drilled section, the magnetometer measurements will address magnetization of the ocean crust, and the borehole televiewer will provide structural detail.

Leg Objectives:

1. Mechanisms leading to the formation and exposure of rocks of deep origin (gabbros, mantle peridotites) in the axial valley or fracture zones of slow-spreading mid-ocean ridges

Standard logs will provide composition, alteration and structure of the drilled section, and will be used to extrapolate core measurements to the actual section drilled. Core recovery in massive igneous sections will be good, but will be poor around fractures or breccia zones. Contacts are most likely to be poorly recovered by drilling.

2. Structure, composition, and magnetizaton of lower ocean crust/upper mantle

Standard logs provide information on structure and composition of the drilled sequence. In addition, borehole magnetometer measurements will be used to assess magnetization within the lower crust and upper mantle, and will be used to assess how alteration has affected magnetic properties.

Logging Tool Objectives:

1. Standard logs (geophysical string, geochemical string, FMS): mineralogical variation as a function of time and location; synthetic seismograms for depth/seismic link; structure and deformation of basement and sediments (IG-4). Chances of success: very good. Provided that holes can be drilled, they will be stable and cool.

2. borehole magnetometer: magnetization of lower crust, and changes in magnetization due to alteration. Chances of success: very good. Typical magnetization of basaltic rocks is high, and sensitive instruments are not needed to record a signal.

3. BHTV: imaging of individual fractures (their azimuth, aperture and whether they are filled or open), dip of dikes (if any) and delineation of volcanic units.

Need for New Logging Technologies

None

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000185

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November 7, 1991

RECEIVED
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Ans'd............

Dr. James Austin,
JOIDES Office,
Institute for Geophysics,
University of Texas,
8701 Mopac Boulevard,
Austin, TX, 78759-8345, USA

Dear Jamie,

A brief note to include with the minutes of the September IHP meeting. These are of course for the upcoming Panel Chairperson's and PCOM meetings. There is a two-page executive summary, the minutes and a series of appendices. You will note that following the executive summary, IHP has instituted a series of formal 'Suggestions to the TAMU/ODP Science Operator'. This is to try to improve the effectiveness of IHP. Of course these are only 'suggestions', but at least we are formally indicating to the operator the wishes of IHP!

I look forward to seeing you in Austin.

Yours sincerely

Ian L. Gibson

Ian L. Gibson,
Chairmam IHP

000186

Information Handling Panel, Sept. 11th - 14th, 1991, Victoria, British Columbia, Canada.

Attendees: Ian L. Gibson, Patricia Fryer, Brian M. Funnell, Michael S. Loughridge, Ted C. Moore, William R. Riedel, Nicholas M.S. Rock, William W. Sager, Tsunemasa Saito, John B. Saunders, Andre Schaaf, Henry Spall, Volkhard Spiess, Sherwood W.Wise.

Liaison: Michael A. Hobart, Yves P. Lancelot, Russ Merrill, Adrian Richards,

Guests: Bill Rose, Chris Lambrecht, Jan Blakeslee, John Coyne

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Executive Summary

Report from the ODP Data Base Group. John Coyne noted that following his appointment that he had initiated a review of the work of the group. This continues at present and will be completed this Fall. This is likely to lead to a major changes in the structure of the ODP Databases with new software and perhaps hardware requirements. In the interim, the panel noted that the new Visual Core Description Software underwent significant testing on Leg 138 with the production of 596 barrel sheets and that the software, although 'buggy', had been well received by the sedimentologists and that they much preferred this system to the older hand-drafted barrel sheets. Problems with the development of a program allowing the speedy input of paleontological data were viewed with great concern by the panel. A subcommittee coordinated by W.R. Riedel will review the way that paleontological data is captured on the ship and follow new developments in software to facilitate this.

Report from ODP Publications. The panel noted the steady progress with publications summarized by Bill Rose. Part A volumes are now routinely being produced in less than 12 months post-cruise and Part B volumes in about 40 months post-cruise. It was felt that further speeding the publication schedule would be counterproductive as there is now concern that the tight publication schedule is impacting negatively on the quality of the Part B papers.

Reports from ODP Computing Services Group. The panel noted the mushrooming growth of computing within ODP over the last decade. To allow for rational planning in the longer term it recommended:

> **That PCOM establish a working group with participants from IHP, SMP, and DMP, and advised by an external consultant to undertake an in-depth external review of hardware and software systems (both ship- and land-based) with a view to determining the best possible future direction for ODP computing and data handling consistent with the objectives of the long-range plan.**

The Panel also noted that there had been little increase in the manpower strength of the Computing Services Group and in particular IHP recommended:

> **That PCOM authorize a second shift of shipboard systems operators to allow 24-hour coverage and so improve the functioning of shipboard science.**

Reports from ODP - Curator. Russ Merrill noted that space in the Gulf Coast Repository was likely to be just sufficient for the remaining Pacific Ocean cores. The workload at the East Coast Repository at

LDGO was likely to outstrip the manpower resources available with the resumption of Atlantic drilling. IHP therefore recommended that:

Consideration be given to the provision of additional staff at the East Coast Repository, to avoid increasing the delay in the distribution of samples when Atlantic Drilling resumes.

The Indexing of the Proceedings Volumes. An IHP indexing subcommittee met for two days prior to IHP in Victoria. Sweeping changes in the indexing of ODP Proceedings volumes are proposed involving (a) the adoption of a simplified two-level structure for the subject index, (b) the full inversion of the majority of the entries, (c) the use of the AGI Thesaurus and Glossary to increase consistency in the index and (d) an increased amount of cross-referencing. It is also proposed that the site index be eliminated and the paleontological index restricted to taxonomic terms. These changes should result in a simpler, shorter, and more consistent index that is easier to use. The Subcommittee proposed that all subsequent indexes conform to this format, and that earlier indexes be recast into a cumulative index covering Legs 101-125 as soon as possible. IHP recommends

That PCOM authorize the immediate preparation of an ODP Cumulative Index for the first 25 legs, taking into account the recommendations of the IHP indexing subcommittee, and that additional funds for the typesetting and printing costs be provided.

National Geophysical Data Center Report. Mike Loughridge introduced Chris Lambrecht, who gave demonstrations of new CD-ROMs covering (1) DSDP Cumulative Index and (2) ODP databases (the latter not yet released). He explained that commercial software was being used for both of these disks. The panel noted with enthusiasm that Macintosh software to interrogate the previously released CD-ROM disk 2 of the DSDP databases had also recently become available. The demonstrations indicated that faults in the structure and content of the DSDP Cumulative Index could be partially circumvented by use of the CD-ROM version.

Other matters considered at an unusually long IHP meeting included (a) The report from the LDGO Borehole Research Group. Processed FMS data for legs subsequent to Leg 121 is being distributed in micro-fiche form and provides much new detailed information for the scientists. (b) Micropaleontological Reference Centers. John Saunders reported that the work of the MRCs was proceeding well. Material from Legs up to 121 had been selected and samples up to the end of Leg 115 distributed. (c) A review of data handling on Leg 138 by Nick Pisias. This clearly indicated the necessity of a review of the on-board computing facilities (See above). (d) Core Log integration. Following a presentation by Paul Worthington, it was stressed that resources and data structures available at present are not sufficient to provide the detailed core log integration of the type envisaged and endorsed previously by SMP, DMP and IHP. It is hoped that the changes presently being planned by John Coyne will change this position. Further discussions on this topic took place at a meeting of SMP/DMP in October. I.L.Gibson represented IHP at this meeting. (e) Cost savings in the production of ODP volumes Russ Merrill noted that ODP volumes were running at some 160% larger (and hence more expensive) than DSDP volumes. Ways to restrict burgeoning costs were discussed including the publishing of large tables and other bulky material on microfiche, floppy disk or CD-ROM at the back of a volume. (f) The IHP meeting concluded with a vote of thanks to Ted Moore in appreciation of his work as the former Chairman of IHP

Suggestions to the TAMU/ODP Science Operator

1. Changes be made in the indexing of ODP volumes to make such indices conform to the guidelines suggested by the Indexing subcommittee and subsequently accepted by IHP.
2. Authors should in future be asked to prepare camera-ready numerical tables for Part B to help reduce publication costs, following guidelines set out by TAMU/ODP.
3. Efforts should continue to persuade authors to keep the size and number of figures used in both Part A and Part B within bounds. In particular, large locality maps in Part B should not be repeated in multiple papers.
4. A joint TAMU/Lamont/NGDC study should be undertaken on the feasibility of issuing FMS and other processed data on CD-ROMs along with Part A.
5. On each leg with significant biostratigraphic objectives, a shipboard scientist should be identified as the 'biostratigraphic coordinator' with the aim of improving the quality of integrated syntheses in this area.
6. An ERB/TAMU staff member be appointed to ensure the adequacy of proposals for biostratigraphic synthesis for each Leg at the 2nd post-cruise meeting, and that he make every effort to ensure that adequate biostratigraphic synthesis is completed where relevant.
7. In relation to the Micropaleontological Reference Centers, IHP recommends that: (A) A revised brochure describing the centers be prepared. (B) That the brochure be sent to all shipboard scientists as part of the pre-cruise documentation (C) That all scientists requesting material for micropaleontological work be sent a copy of the brochure with their samples. (D) That advertisements be placed in the JOIDES Journal describing the MRCs, and (E) That advertisements be placed in some micropaleontological journals.
8. Efforts should continue to provide software for the input of on-board paleontological data.
9. Any re-design of the ODP database structure should allow for two or perhaps three 'depth' parameters and that space be allowed for a stratigraphic age indication to be attached to every section.
10. Further efforts should be made to encourage scientists to submit data from Part B to the ODP data bases. This might take the form of: (a) a revised letter to be sent to each Part B scientist with the present copyright forms, (b) Notifying the scientist that the data is archived at ODP and explaining the desired data format. (c) Notifying the scientist that the data is issued periodically on CD-ROMs
11. High priority be attached to the provision of a new network file-server(s) as the VAX can be overloaded by this activity.
12. The Appletalk network be upgraded to full Ethernet capability to improve the speed of the network.
13. Provision be made in the design of new data-base structures for the manipulation of large ASCII data-sets. Without such resources core-log integration will be impossible.
14. We suggest that ODP/TAMU co-ordinate a workshop to help formulate working definitions for 'real depth', and/or 'composite depth' and/or 'corrected depth'
15. We suggest that the publication policy in effect at present be slightly modified to indicate that subsequent to the 2nd post-cruise meeting scientists must satisfy their obligations to the project by contributing to Part B. Only after the acceptance of such a manuscript are authors free to

submit derivative or similar material to the outside literature. Dual submissions (allowed in the recent past) is no longer allowed.

16. The panel notes that it now attaches less significance to the public release of post-cruise ASCII data sets, in the hope that revisions to the database structure at ODP will allow future shipboard scientists more ready access to the data on board.

Review of Action Items from Previous Meeting

Mike Loughridge confirmed that the upcoming ODP CD-ROM will indeed include a background statement requesting feedback in the form of corrections and comment from users.

Ted Moore confirmed that he had written to Terence Edgar to thank him for his efforts relating the lithology symbols used by authors in the Proceedings volumes. The Panel were assured that efforts will continue to 'persuade' authors to conform to the established symbol guidelines.

Ian Gibson will enquire as to the status of leftover DSDP funds that might be used for (a) incorporation of existing DSDP data into the databases – data that is presently missing (trace elements, isotopes etc) (b) recuration of DSDP cores that need 'repair'. ACTION

Russ Merrill stated that efforts will continue to implement user-friendly electronic means of requesting samples. The panel commented that undue efforts in this regard are not warranted as the present methods are not generating serious delays and only a minority of users would utilize any electronic system. Matters related to other actions items are dealt with elsewhere in these minutes.

Reports from ODP - Data Base Group - John Coyne

John Coyne in presenting his report (Appendix A) noted that he was appointed in May and that two other members of his staff were new. On appointment, he had initiated a review of the work of the group. This continues at present and will be completed this Fall. Information already in hand indicates a growing proportion of the data requests are for quantitative digital data rather than for descriptive and photographic material.

Visual Core Description Software. The panel noted with satisfaction that this software underwent significant testing on Leg 138 with the production of 596 barrel sheets. Ted Moore, a shipboard scientist on Leg 138, commented that the software, although 'buggy', had been well received by the sedimentologists and that they much preferred this system to the older hand-drafted barrel sheets. Russ Merrill reported that the software would result in significant (but as yet unquantified) cost and time savings in the production of Part A. In reply John Coyne commented that fixing the problems in this software was a priority and a major on-going task of one of his staff.

John Saunders and Bill Riedel noted with great concern that the space available on the VCD for the recording of paleontological and age information had been very significantly reduced. Such important primary information would be lost if not recorded at this time. John Coyne said that the layout of the VCD resulted from consultation with SMP and IHP but that he would examine if this space could be increased. ACTION

After questioning from the panel, John Coyne emphasised that although a link with the CORELOG database was planned, it had not been fully implemented and that at present no information from the new VCD computer generated sheets was being passed in the other direction to the S1032 structured data bases. It was noted that this data transfer could be done 'on-line' or as a subsequent 'batch' task. Work on this stage of the program development was in progress.

Panel members emphasized the importance of the data capture stage and the completion of the VCD database.

A considerable amount of time had been spent checking entries in the CORELOG database to improve the quality of the data. Chris Lambrecht commented that the necessity for having a 'clean' CORELOG data-set became very apparent during compilation of the ODP CD-ROM.

Problems with the development of a program allowing the speedy input of paleontological data, outlined in Appendix A, were viewed with great concern by the panel. The panel asked to look at the design specifications of the user interface and suggested that a simple keypad input device might be easier than a mouse/menu system when the simultaneous use of a microscope and a computer was required. John Coyne promised to liaise with the panel over the design of the new program. It was also noted that significant cost savings might result if the paleontological software could also be used to generate large, complex range charts.

A subcommittee coordinated by W.R. Riedel will review the way that paleontological data is captured on the ship and follow new developments in software to facilitate this. It will attempt to define ways that age calls can be incorporated into all data files that require them. It will make available the necessary charts so that these can be machine read. All aspects will be co-ordinated with John Coyne of CSG. ACTION

A review of the general structure of the databases continues at present and will be completed shortly. This includes a re-examination of the broad database requirements of ODP and the use of the S1032 program at present in use.

Reports from ODP - Publications - Bill Rose

The panel noted with pleasure the steady progress with publications summarized by Bill Rose in his Publications Activities Report (Appendix B). Part A volumes are now routinely being produced in less than 12 months post-cruise and Part B volumes in about 40 months post-cruise. It was felt that further speeding the publication schedule would be counterproductive given that, as noted in Appendix B and confirmed by Patricia Fryer and Sherwood Wise, there is now concern that the tight publication schedule is impacting negatively on the quality of the Part B papers.

The panel noted the publication of the DSDP index and the simultaneous appearance of the CD-ROM version (see below).

Data from the Science Citation index indicated clearly the rapidly increasing impact of ODP publications in the scientific community. However, it was agreed that it was difficult to assess the significance of the absolute numbers of citations. Ian Gibson noted that ODP publications were included in the GEOREF CD-ROM database in a long and cumbersome form and in a tardy fashion. He reported that he had written to AGI on behalf of the panel about this matter.

Matters relating to the work of the Editorial Review Boards for individual legs and the preparation of the indexes to the ODP volumes are dealt with elsewhere in the minutes.

Reports from ODP - Computing Services Group - Russ Merrill

Russ Merrill, in presenting his report (Appendix C), noted the formation of the ODP software priorities Committee and that the report only covered activities within the Computing Services Group. Computing related to logistics, engineering and other sections was sometimes being undertaken by computer literate staff in those sections, rather than within CSG.

The panel noted with concern that the demands by the community for hardware and software development are severely stretching the resources of the Group and that notwithstanding the mushrooming growth of computing over the last decade, there had been little increase in the manpower strength of the group. (See PCOM recommendations).

A fault on the VAX which had caused repeated system crashes during Legs 138 and 139 was being addressed by DEC during the Victoria port-call. Attempts were also being made to minimize problems with the installation of the graphical Windows environment on the shipboard upgraded IBM-PC-compatible-386 machines.

Appendices to the CSG report dealing with core-log integration were discussed under a separate agenda item and are dealt with elsewhere in the minutes.

Reports from ODP - Curators Report - Russ Merrill

Commenting on the report on Curation and Repositories (Appendix D), Russ Merrill noted that space in the Gulf Coast Repository was likely to be just sufficient for the remaining Pacific Ocean cores provided the program of drilling in the Pacific was not unduly extended! The workload at the East Coast Repository at LDGO was likely to outstrip the manpower resources available with the resumption of Atlantic drilling (See PCOM recommendations). However plans are in hand to increase the refrigerated space to accommodate the influx of material following the resumption of Atlantic drilling in 1993.

The panel suggested that the updated video-disk of the core photographs be distributed to users who had received the initial disk.

LDGO Borehole Research Group Report to IHP - Michael Hobart

Commenting on the report of the LDGO Borehole Research Group (Appendix E), Michael Hobart noted that questionnaire results confirmed the increasing interest of the scientific community in well logs, and that this interest now extends to groups not traditionally using logs, such as sedimentologists, geochemists and stratigraphers. Processed FMS data for legs subsequent to Leg 121 is being distributed in micro-fiche form and clearly provides much new detailed information for the scientists.

The panel recognized the importance of training oncoming shipboard scientists in the value and interpretation of logging data.

Micropaleontological Reference Centers (MRCs) - John Saunders

John Saunders reported that with the possible exception of the Reference Center in Moscow, the work of the MRCs was proceeding well. Material from Legs up to 121 had been selected by himself, William Riedel and Annika Sanfilippo. Samples up to the end of Leg 115 have been distributed.

Some members of the panel were concerned at the relatively small numbers of scientists using the centers. However it was noted that the centers are a long-term project directed at a fairly specialist user community, and that use will increase as the collections become better known. OFDP/TAMU intends to issue a new brochure to advertise the centers. This will detail much more clearly what is available and how it is displayed and will draw attention to the advantages of using the collections.

The panel reviewed the suggestions put forward by Dr. Ellen Thomas from Cambridge and Drs. Huber and Buzas at the Smithsonian Institution. The generous offer from a number of taxonomic experts to provide sets of named specimens of all major microfossil groups for use on shore and ship is appreciated and endorsed by the panel. Experience suggests that the shipboard collections should be under the control of the Laboratory Officer and under the general overall supervision of the ODP/TAMU Staff paleontologist (presently J. Firth). The provision of reference sets of important taxa at some or all of the MRCs is also highly desirable and one additional set might be available to be signed out on request to upcoming shipboard scientist. The need for consultation between paleontologists during the preparation of the sets is recognized and this will need both formal and informal meetings. John Saunders agreed to co-ordinate an IHP response to the suggestions . ACTION

Dr. S.W. Wise noted that he already has available a set of nannofossil preparations that could be placed on the ship and we recommend that this be done in co-ordination with Dr. Marie Pierre Aubry and J. Firth. Such a set might form a test set to highlight problems with shipboard collections

The Panel notes Dr.Huber's concern about the deposition of types of new taxa described from DSDP/ODP material. It has always been at least an implicit requirement that paleontologists follow normal practice and deposit such material in recognized centres. IHP confirms that paleontologists are expected to deposit type material at recognized centres and that the preferred centre was the Smithsonian Institution in Washington.

The panel noted and endorsed the arrangements that had been made for a meeting of the curators of the MRCs in June 1992 in Basel. They noted that JOI had agreed to provide some travel funds for this meeting, emphasising the importance of continuing support for the Centers.

Non-Performers

The Panel agreed to consider 'violations' under this heading only once a year, and the matter will therefore be dealt with at the annual Spring IHP meeting at College Station. Ian Gibson noted that letters sent out by the PCOM Chairman, relating to non-performance, had recently caused a significant amount of irritation. He therefore agreed to review, with Jamie Austin, the content of the letter . The object continued to be to firmly remind sample recipients of their responsibilities ACTION to the program, without unnecessary rancour.

The Indexing of the Proceedings Volumes

Henry Spall presented the report (Appendix F) of the indexing subcommittee prepared during a two-day session in Victoria, immediately prior to the present IHP session. Sweeping changes in the indexing of ODP Proceedings volumes are proposed involving (a) the adoption of a simplified two-level structure for the subject index, (b) the full inversion of the majority of the entries, (c) the use of the AGI Thesaurus and Glossary to increase consistency in the index and (d) an increased amount of cross-referencing. It is also proposed that the site index be eliminated and the paleontological index restricted to taxonomic terms. These changes should result in a simpler, shorter, and more consistent index that is easier to use. The Subcommittee proposed that all subsequent indexes conform to this format, and that earlier indexes be recast into a cumulative index covering Legs 101-125 as soon as possible.

William Sager noted that the AGI Thesaurus was a large bulky document that would be difficult to have at hand during indexing. In response, the Committee noted that it should be possible to use a simple ASCII list of the terms as a 'pop-up dictionary' in many word-processing packages and that this would aid consistency in indexing.

Russ Merrill commented that the extra geological know-how to improve the consistency of the index could only be provided by an experienced geological editor working on the index after its compilation. This might delay the publication of Part B by perhaps one or two weeks and there would be an added financial burden. THe cost of revising and printing the index to Legs 101-125 might be as high as $70,000. In response the panel noted that the simplified shorter index would be cheaper to prepare and print and that the savings might help off-set the cost of editing current volumes. A cumulative index for ODP has yet to be prepared, and must be of high quality as it forms a key to much ODP data. Under the circumstances the panel considered such expenses are justified.

National Geophysical Data Center Report - Mike Loughridge

Mike Loughridge introduced Chris Lambrecht, who gave demonstrations of new CD-ROMs covering (1) DSDP Cumulative Index and (2) ODP databases (the latter not yet released). He explained that commercial software was being used for both of these disks. The panel noted with enthusiasm that Macintosh software to interrogate the previously released CD-ROM disk 2 of the DSDP databases had also recently become available. The demonstrations indicated that faults in the structure and content of the DSDP Cumulative Index could be partially circumvented by use of the CD-ROM version.

A review of data handling on Leg 138 - Nick Pisias and Ted Moore

Nick Pisias, co-chief on the highly productive Leg 138, gave an overview of experiences with the computer system and data acquisition/presentation. He had brought three Sun SPARC workstations on board ship, which had been successfully integrated into the network. He suggested that few scientists had used the PCs, instead using the Macintoshes and Suns. He noted that the workstations and associated software were required in order to effect successful graphical integration of different data-sets of large size, acquired during MST and color reflectance measurements. He also commented on the poor performance of the VAX, partly owing to its dual usage as a file-server and as CPU. Present shipboard data-handling facilities will be increasingly stretched by the addition of further devises for making continuous measurements on whole-round and split core.

Ted Moore and Nick Pisias noted that inter-hole correlations on Leg 138 indicated that the length of the composite cored intervals calculated from measurements made on the recovered core were 10-15% longer than calculated lengths derived from the drill string measurements and logging. This clearly raises significant problems in core-log integration and requires that two or perhaps three 'depth' measurement be integrated into the ODP data structure.

It was agreed that the presentation from a recent co-Chief, outlining his experiences on board had been very useful. Ian Gibson agreed to invite other co-chiefs to report in a similar fashion ACTION

Core-log integration

Russ Merrill commented that ODP/TAMU had made some proposals under this regard (appendix A of Computer Services Group report) but they had not been funded. The panel endorsed the concept of holding a workshop to formalize working definitions for 'real depth', and/or 'composite depth' and/or 'corrected depth'.

Paul Worthington, chairman of DMP, talked to the panel about the problems of core-log integration, a problem the oil industry had not solved after many decades of effort. He stressed that increased stature and scientific spinoff to ODP would result from ODP solving this problem. He suggested that workshops and working groups be formed to tackle this problem incrementally, building on the experiences of the Miami workshop. A wide-ranging discussion followed.

It was stressed that resources and data structures available at present are not sufficient to provide the detailed core log integration of the type envisaged and endorsed previously by SMP, DMP and IHP

Editorial Review Boards

Sherwood Wise and Patricia Fryer reported their experiences of ERBs, considering them to be a necessary evil. A general concern was expressed about a perceived decline in the quality of papers in Part B; some articles were immature or incomplete, and not of a quality for outside journals. The importance of e-mail communication between ERB members to expedite the review process was stressed.

Mandatory Biostratigraphic Synthesis

The Panel recognizes the problem outlined in the letter of Drs. Jenkins and Ramsey. John Saunders agreed to reply to the letter on behalf of IHP We agree that the minimum level of ACTION biostratigraphic synthesis is not being achieved on some legs and this is of great concern.

We agree and endorse that adequate biostratigraphic synthesis be present in all Part B volumes. This should take the form of biostratigraphic synthesis chapters unless these are made redundant by information already available in Parts A and B togaether. This information to be available at the time of production of the Scientific Results (e.g., any changes in dating subsequent to the Initial Report should be included). Co-Chief Scientist should be encouraged to designate a Stratigraphic Coordinator on their leg.

Cost savings in the production of ODP volumes

Russ Merrill noted that ODP volumes were running at some 160% larger (and hence more expensive) than DSDP volumes. Possible ways to restrict burgeoning costs were discussed, including (1) asking authors to prepare camera-ready tables; (2) restricting the number of tables and figures per paper; (3) reducing the printed size of figures; (4) printing only one locality map per Part B volume (NOTE - Leg 117 Part B has some 20 locality maps, all minor variations on the same theme and some occupying over half a page); (5) including large tables and other bulky material on microfiche, floppy disk or CD-ROM at the back of a volume.

Other problems raised during the wide-ranging discussion included status of ODP volumes as 'grey literature', and the likelihood of serious inconsistencies between data output in individual volumes and those output on an overall ODP CD-ROM.

Outside publication of ODP material

The panel noted the possible publication of a series of volumes on ODP topics, as heralded in a letter from Paul Robinson. Although the scientific objectives were viewed as laudable, there was unanimous concern about the publisher chosen for the venture, namely Elsevier.

It was noted that the Journal of Geophysical Research will publish papers resulting from the ODP Indian Ocean Symposium held this Summer in the UK.

PCOM has approved the publication of four synoptic ODP articles in 'GSA Today'. The first of these will appear in October 1991.

The issue of the dual submission of material destined for Part B in outside journals was also discussed. This had proved impossible to arrange, and it was decided that authors should fulfil their obligations to ODP before submitting outside.

Arctic Databank

Mike Loughridge brought to IHP's attention a letter from Dr.G.W.Brass describing how he hoped to establish an Arctic Site Survey Data Bank. IHP considered that this might duplicate facilities provided by NDGC and Mike Loughridge agreed to contact Dr Brass to try to see if this duplication of effort could be avoided. ACTION

Motion of Appreciation

John Saunders commented that this was the first IHP meeting for some years that was not chaired by Ted Moore and suggested that the present chairman might write to Ted to convey to him the Panel's appreciation of his efforts, energy and enthusiasm on behalf of IHP. The suggestion met with unanimous approval . ACTION

Date and time of the next meetings

It was tentatively agreed that the next meeting of the Panel would start on Wednesday, 1st April, 1992, in College Station. It was suggested that the subsequent meeting of the Panel might be held in Marseille during the week of 16th September, 1992.

000196

APPENDIX A
(IHP- Fall '91 meeting)

000197

Data Base Group Report to the Information Handling Panel

I. Data Requests

The Data Librarian and Data Analyst have responded to a total of 1,260 requests for individual DSDP and ODP datasets since May 1985. The variation in the number of requests with time is shown in Figure 1. The 1991 data include requests received up to July 31st. Even doubling the current figures (estimating 1991 at 296 requests), it can be seen that the number of requests has decreased from a high of 408 in 1989. In part, this decrease can be attributed to the shipboard scientists being able to obtain and take the digital data with them upon departing the ship. The release of the DSDP CD-ROM in 1989 probably contributed to a decrease in data requests for this data in 1990. In addition, the increase in ODP volumes being published increases the available data sources thus reducing the requests from the database group. The 1989 peak may also be related to the amount of data required to respond to the JOIDES request for proposals for projects in "any ocean" that year.

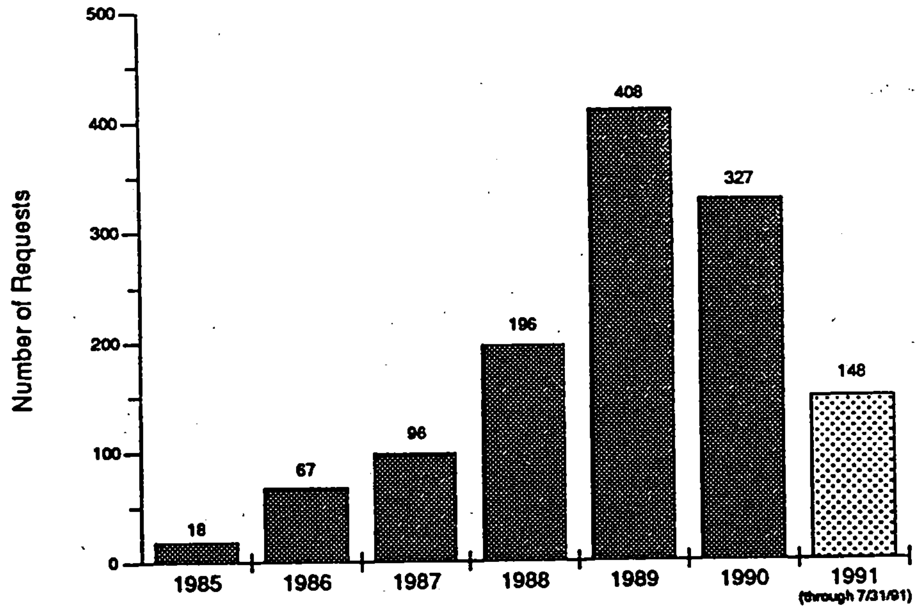


Figure 1: Number of data requests of all types per year.

Over time there has been a systematic change in the type of data requested. The number of requests by type of data is shown in Table 1 and in Figure 2. In terms of actual numbers, the requests for photos far exceeds that for other types of data. What this information does not show is the shift in the type of data being requested. By looking at the percentage of requests by type per year (Table 2) it can be seen that there is a definite shift from analog data to digital data

TABLE: 1

Data Requests by type and origin of request from May 1985 to July 1991

Database Accessed	Request Public	In-house	Total
Photo	361	14	375
Leg, Site, Hole summary	85	43	128
Physical Properties	71	23	94
Chemistry	54	28	82
Sediment Description	73	7	80
Underway Geophysics	56	7	63
Corelog	26	36	62
Paleontology	53	5	58
Smear Slide	33	19	52
Paleomagnetics	41	5	46
Sample Record	22	9	31
Igneous/Metamorphic Rock Description	22	7	29
XRF	25	3	28
Igneous/Metamorphic Thin Section	11	0	11
Sample Request	8	1	9
Bibliography	7	1	8
Others†	88	16	104
TOTALS	**1,036**	**224**	**1,260**

† This category includes maps, technical notes, well logging journals and downhole tool request for data as well as any requests not covered in the above datasets.

requests. The photo requests have dropped from a high of 83% in the early stages of the program to about 22% for requests to date in 1991. At the same time there has been an increase in the percentage of requests for data in the following categories: physical property, chemistry, corelog, paleontology and smear slides. This indicates a trend towards more digital data and in particular the increased awareness of the usefulness of the physical property data.

The percentage of requests from within ODP/TAMU (in-house) versus those from outside ODP/TAMU (public) has remained relatively constant at about 20% over the last three years. This percentage is reflected in the relatively large number of in-house requests for data from the CORELOG and LEGS datasets by the core repositories and publications department.

Currently the average turn around time on data requests is 8 days. As more data are requested in digital form this process will increase in complexity. The Data Analyst is developing tools to address this situation.

TABLE: 2

Percentage of Data Requests by type - 1985 to 1991

Database Accessed	1985	1986	1987	1988	1989	1990	1991
Photo	83%	75%	43%	43%	19%	22%	23%
Physical Properties	0%	3%	5%	8%	6%	8%	15%
Chemistry	0%	1%	2%	6%	6%	8%	10%
Other	0%	0%	4%	4%	6%	4%	10%
Corelog	6%	1%	0%	1%	6%	6%	9%
Paleontology	0%	0%	2%	2%	6%	5%	7%
Smear Slide	0%	1%	2%	1%	6%	4%	7%
Paleomagnetics	0%	1%	5%	4%	4%	2%	5%
Sediment Description	6%	9%	6%	6%	7%	6%	4%
Legs	0%	4%	8%	8%	12%	14%	3%
Sample Record	0%	1%	6%	2%	2%	2%	1%
Igneous/Met. Description	0%	0%	3%	2%	2%	3%	1%
Underway Geophysics	6%	1%	7%	7%	4%	7%	1%
XRF	0%	0%	0%	2%	3%	3%	1%

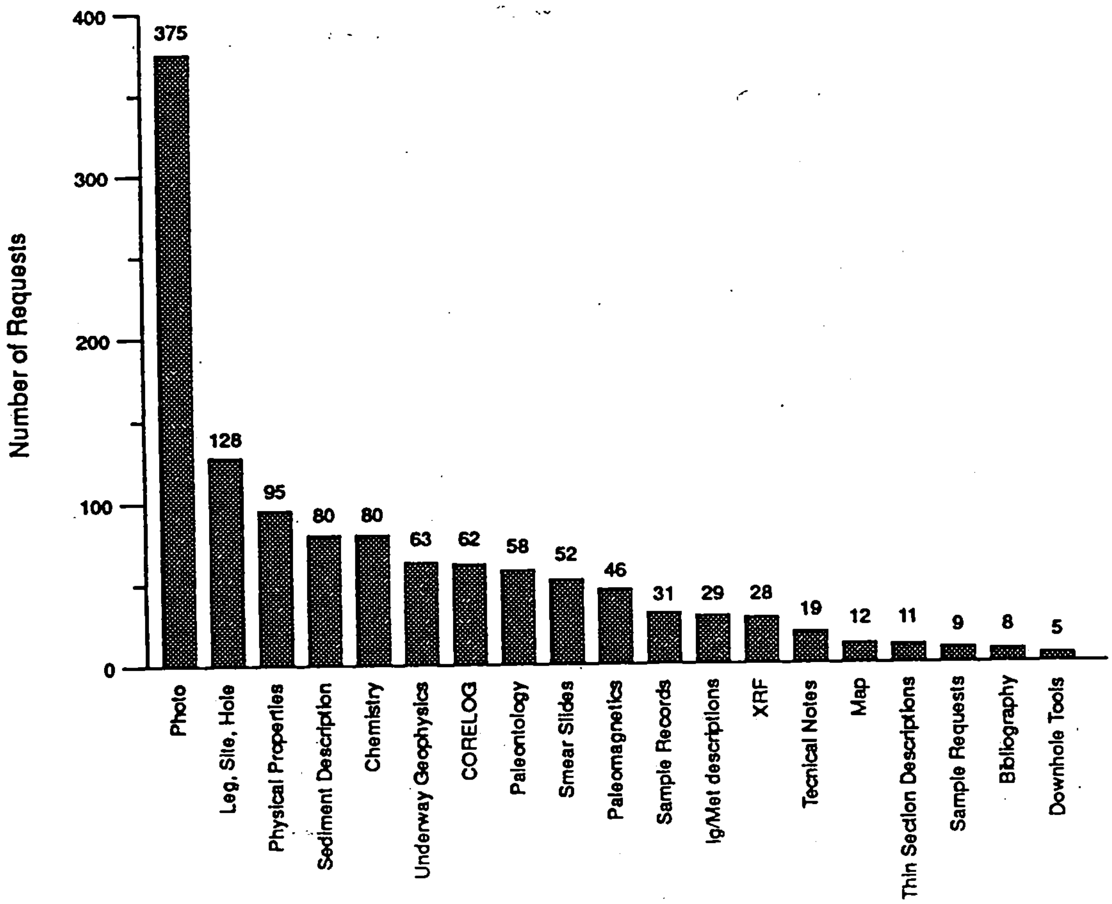


Figure 2: Number of data requests by type, 1985 - 1991

The distribution of requests by country is shown in Figure 3. A total 961 individuals made 1,260 dataset requests. A total of 14 requests from countries making less than 5 requests are not included in Figure 3. There is a strong bias towards US requests reflecting both the logistics and geographic relationship of US institutions with ODP. It is obvious from this data that more effort is needed to increase the awareness of other groups to the availability of the ODP data.

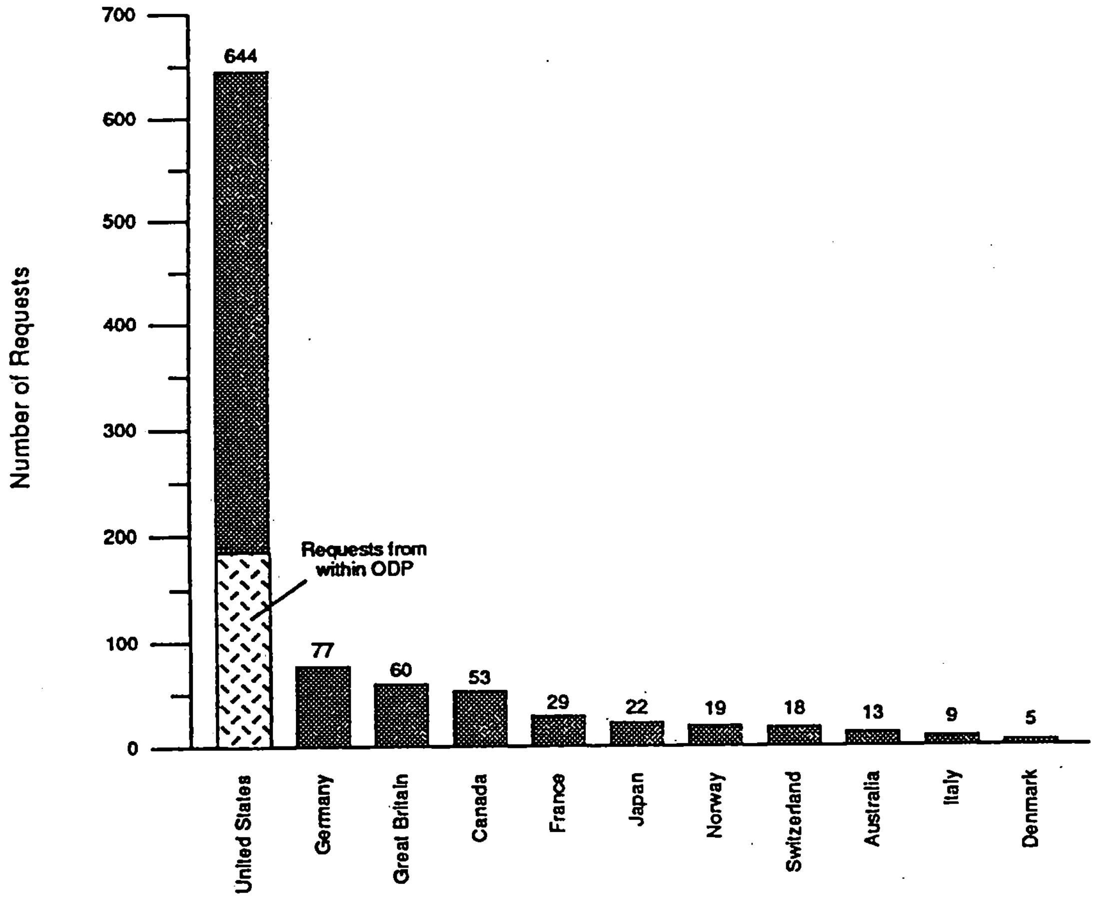


Figure 3: Number of data requests by country 1985 - 1991

II. ACTIVITIES

VCD

The original programmer of VCD, Larry Bernstein, left ODP February 24th, 1991. The current programmer, John Olsen, started working on the program in May. This will result in a slight delay in the full implementation of this product. The current programming emphasis is on correcting fatal errors within the previously developed code. Also, certain interface features have been re-worked to increase the efficiency of data entry through more positive feed back to the user. These items include highlighting of the active column, display of subcolumn dividers when columns are activated, a tracking marker to provide location feedback on the ruler and automatic cursor changes to reflect the function currently active. Additionally, graphic lithology is displayed with increasing components from left to right as reflected in the descriptive name.

The program underwent significant testing on Leg 138 with the production of 596 barrel sheets. Users documented a number of serious bugs, some of these are fixed in the version being used on Leg 139, work continues on the remainder. A sample barrel sheet from Leg 138 showing the addition of "wiggle" trace data columns in front of the graphic lithology column is shown in Figure 4. This composite barrel sheet is currently composed manually using PICT documents pasted in front of the VCD barrel sheet.

The next phase of VCD development will address the issues surrounding the incorporation of networking connections to the CORELOG database.

CORELOG Editing

The complete turn over of graduate student staff working on the CORELOG edits necessitated the implementation of a documentation and training program before valid editing could commence. This phase will be completed by August 31. From this program a "How To Manual" will be produced along with a method of tracking edit requests.

Editing is complete for legs 101 to 115 and 127. Preliminary edits are complete for legs 116 and 133.

Paleontology Program

A review of the progress on the paleontology program BugIN indicated that the contractor was not able to meet the requirements as specified in the original scope of work. The contract was cancelled. A new RFP will be sent out the beginning of September. A review of the requirements for this product will result in clearer specifications being outlined in this latest request. By "prototype" designing the data entry system, the number of entry windows has been reduced from as many as four screens in BugIN to two, one for sample information and one for species information. A number of lookup selection lists and selectable buttons on the entry windows will also increase the rate of data entry. A reevaluation of the original paper data forms resulted in fewer dataset attributes being required on the entry windows. Some modifications will need to be made to the paleontology database to accommodate this new program.

It is anticipated that the program development will take 8 to 10 months.

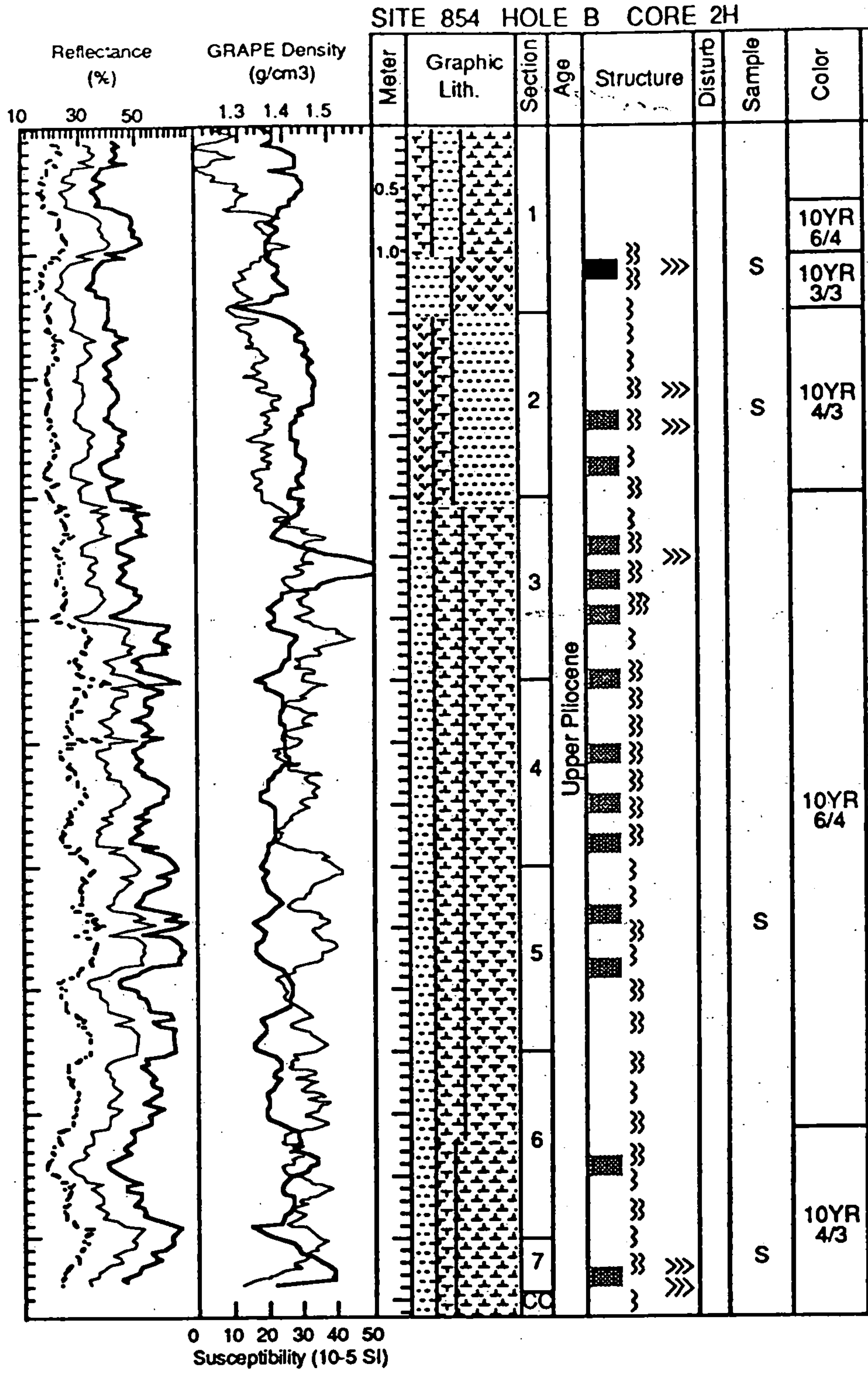
III. PERSONNEL

All four full-time positions in the Data Base Group are now filled. Student help for the coming year will be provided by 5 graduate students working on data editing and input for CORELOG and the paleontology database.

	March	April	May	June	July	August
Supervisor			←	John Coyne	→	→
Systems Analyst			←	John Olsen	→	→
Data Librarian				Laura Bagwell		↔
Data Analyst	←	←	Paul Davis	→	→	→

SITE 854 HOLE B CORE 2H

CORED 8.4 - 17.9 mbsf



Description

DIATOM FORAMINIFER CLAY WITH OXIDES, CLAYEY NANNOFOSSIL OOZE WITH RADIOLARIANS and CLAYEY FORAMINIFER NANNOFOSSIL OOZE W/ OXIDES & RADIOLARIANS

Major Lithologies:
The dominant lithology in Section 2 is dark brown DIATOM FORAMINIFER CLAY WITH OXIDES. In Sections 3 through 6 the dominant lithology is light brownish yellow CLAYEY NANNOFOSSIL OOZE WITH RADIOLARIANS. From the middle of Section 6 through the core catcher, and interbedded in Sections 3 through 6 is dark brown CLAYEY FORAMINIFER NANNOFOSSIL OOZE W/ OXIDES & RADIOLARIANS.

Minor Lithologies:
The top of Section 1 is dark brown to light yellowish brown FORAMINIFER CLAYEY NANNOFOSSIL OOZE, and the lower part of Section 1 is dark brown DIATOM CLAY WITH OXIDES.

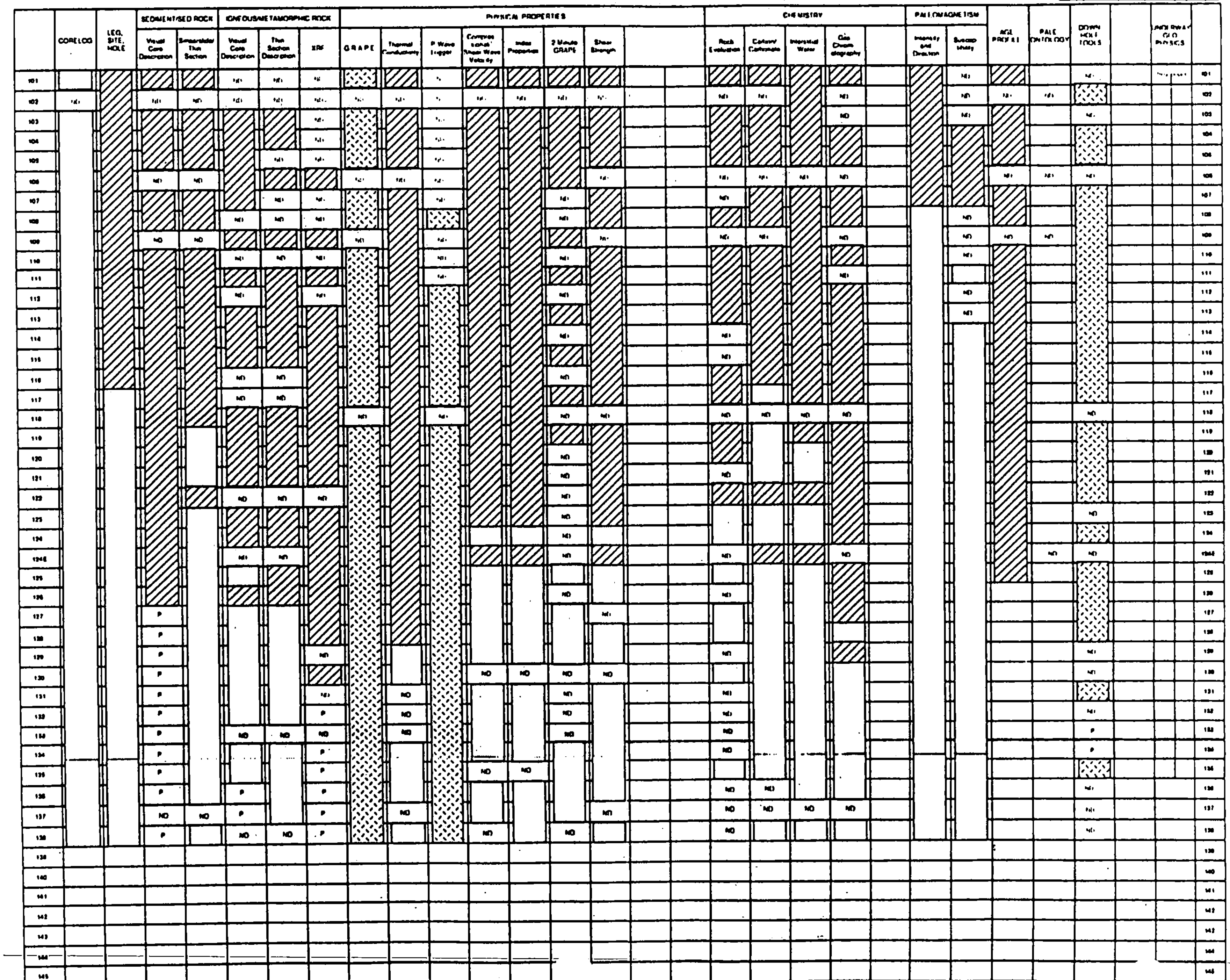
General Description:
TRACE FOSSILS: Bioturbation is generally light to moderate with more intense burrowing within the darker beds in which Zoophycos is often seen. Solid burrows and Planolites are abundant with occasional vertical burrows.

BANDING CONTRAST: Slight to moderate.

revised 7/31/91

Status of the ODP Database

Data entered onshore
Data entered on the ship ... S1032
Direct capture, but not in S1032
ND No data collected
P Paper copy



000204

APPENDIX B

Summary of ODP Publications Activities, March–August 1991
(Prepared by W. D. Rose for September 1991 IHP meeting)

000205

1. We continued preparation and publication of ODP *Proceedings* volumes as follows (see ATTACHMENT 1):

a. *Initial Reports:* Vols. 130 and 131/132 were printed and distributed. Vol. 133 is at the printer.

b. *Scientific Results:* Vols. 114, 117, and 118 were printed and distributed. Vol. 119 is at the printer.

c. ATTACHMENT 2 shows volumes scheduled for distribution during the 1992 fiscal year. ATTACHMENTS 3 and 4 show the number of volumes and the number of published pages, respectively, produced during fiscal years 1987–91. ATTACHMENT 5 shows the time in publication of IR Vols. 120 through 136/137. ATTACHMENT 6 shows the time in publication of SR Vols. 104 through 124.

These attachments were prepared by our chief production editor, Jennifer Hall.

2. ODP volume indexes: The IHP indexing subcommittee, under the chairmanship of Henry Spall, has asked me to join them at a 2-day meeting in Victoria just prior to the full IHP meeting there. Jan Blakeslee, our liaison with our indexing subcontractor, Wm. J. Richardson Associates, also will be there at the request of the subcommittee. The subcommittee has been studying an independent evaluation of the index to ODP Vol. 117 (performed by Richard Raper of Indexing Specialists of Hove, East Sussex, England). This evaluation will be discussed at the meeting, together with choices of better terms and more appropriate hierarchical ranking for some of the terms. Russ Merrill and I will come to the meeting with several possibilities for trimming publication costs in case the subcommittee feels that longer (and more costly) indexes are desirable. Henry expects that conclusive decisions on these matters will have been made by the end of the meeting.

3. History of manuscript submission and review: Debbie Partain and Janalisa Soltis have continued the series of four graphs that show the period of elapsed time vs. the number of manuscripts during the periods when (1) manuscripts were initially submitted, (2) reviews were received, (3) revised manuscripts were received, and (4) final disposition (acceptance or rejection) was received. The series of graphs prepared for the IHP meeting in March covered SR Vols. 117, 118, 119, and 121. The current series (ATTACHMENT 7) covers Vols. 120, 122, and 124 (Vol. 123 has not yet closed). This information shows in detail where lag time developed before and during the review process.

4. DSDP cumulative index: Although in my last report to IHP I had forecasted publication by spring, both the printed and the CD-ROM expanded electronic versions will be published and distributed in August. A set will be available at the meeting for inspection.

5. Update on software programs for entering paleontological data: Because of the unsatisfactory performance of the subcontract programmer to adapt the BUGIN program to satisfy ODP's needs, the subcontract was terminated. Another request for proposals will be distributed by the Science Operations Department shortly to identify a responsible subcontractor to do the work. The final product of this Macintosh program will supersede the Checklist II program and will be developed to read existing Checklist files as well as new Checklist files submitted by authors for publication in the *Proceedings*. The range charts resulting from the new program can be "output" to a graphic file that can be easily modified and completed by an ODP illustrator if additional information is needed.

000206 6. Manuscript-submission deadlines: Original and revised deadlines for manuscript submission for SR Vols. 120 through 129 are shown in ATTACHMENT 8, prepared by Janalisa Soltis.

7. ODP/DSDP literature citation search: When JOI's third performance-evaluation committee visited our ODP offices this past May, they felt that one of the pertinent criteria for evaluating the effectiveness of the Program is the extent and number of citations of chapters in ODP (and DSDP) volumes in the literature of marine geology and geophysics. In response, Russ Merrill and I set about determining the best means for accomplishing this objective. We decided that the Institute for Scientific Information (ISI) in Philadelphia, publishers of *Science Citation Index*, would be the best prospect. We found early that the search could not be done in the conventional way, because we would not be searching for papers by specific authors but would want to see what authors have cited papers in the ODP *Proceedings* and DSDP *Initial Reports* volumes, and the number of these citations. We have subcontracted with ISI to do this type of search for us after finding that they cover the major journals in the geological sciences. The ISI database will be searched in such a way as to separate the ODP and DSDP citations. We expect to receive the results of the search in electronic format by the end of August. We plan to have a printed version at the IHP meeting, if possible.

8. A noticeable trend by authors to submit lesser versions of manuscripts: This year we have noticed a regrettable trend in which authors are submitting manuscripts to the *Scientific Results* volumes of the *Proceedings* that are somewhat preliminary in nature and then later submitting essentially the same studies in greater depth for journal publication. We feel that one of the reasons, perhaps the main reason, for this is that the accelerated publication schedule of 30 months post-cruise recommended by PCOM does not allow sufficient time for many authors to complete their research before the initial manuscript deadline. I offer no solution but feel that the Panel should be aware of the problem.

Attachments 1 through 8

ATTACHMENT 1

Proposed Distribution Dates of ODP Volumes - Fiscal Year 1991

	Initial Reports Volume	Date to Printer	Date Distributed	Months Post-Cruise	*Scientific Results* Volume	Date to Printer	Date Distributed	Months Post-Cruise
OCTOBER								
NOVEMBER								
DECEMBER								
JANUARY	129	11-2-90	12-24-90	11				
FEBRUARY	130	2-7-91	3-20-91	12	114 117	12-20-90 12-20-90	2-28-91 2-28-91	45 40
MARCH								
APRIL								
MAY								
JUNE	131 132	4-3-91 5-2-91	6-91 6-91	12 10				
JULY					118	5-17-91	7-31-91	43
AUGUST					119	5-91	8-91	42
SEPTEMBER	133	7-91	9-91	11	121 124	8-91 7-91	9-91 9-91	39 32

August 1, 1991

000207

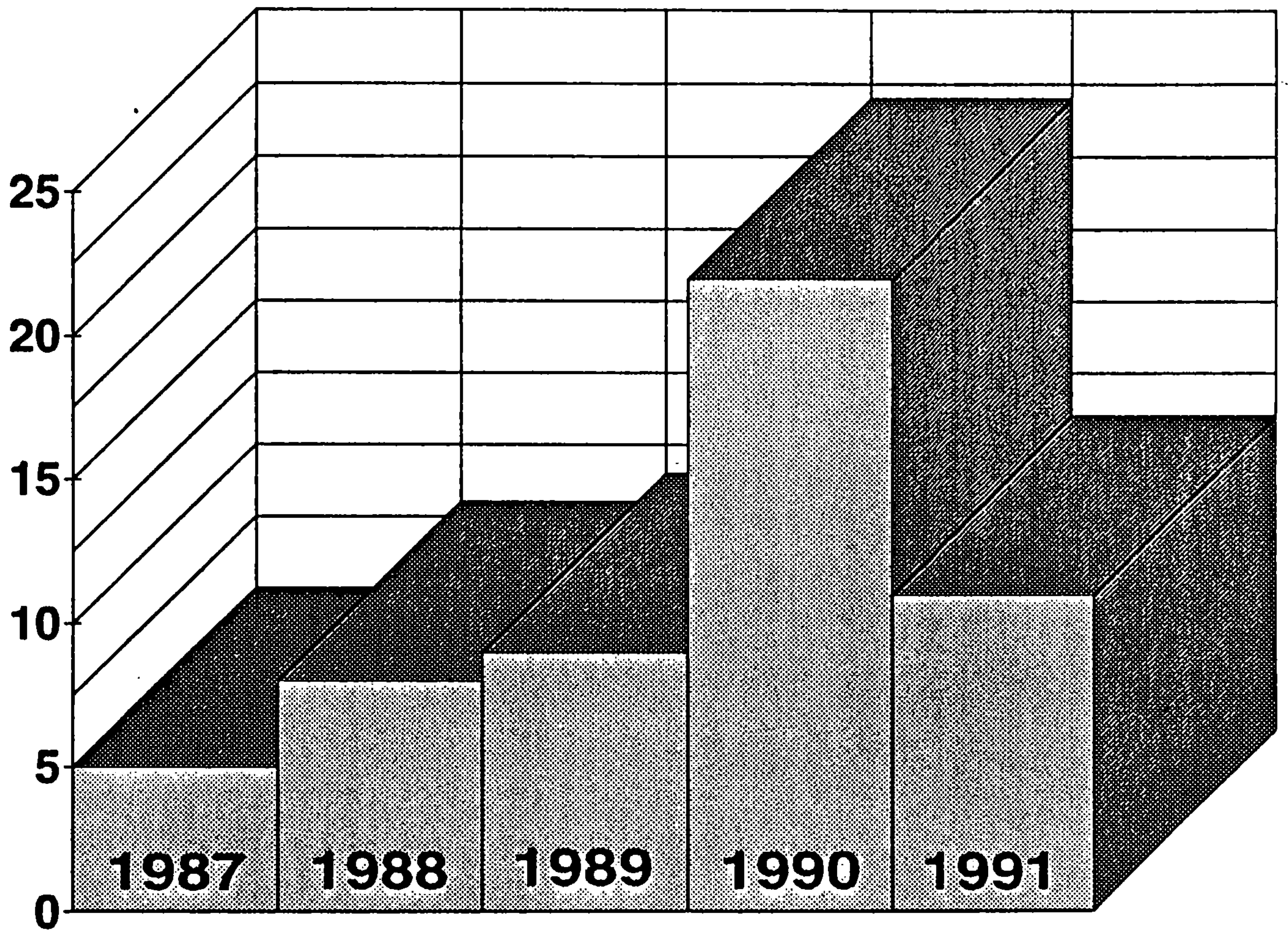
000208

Proposed Distribution Dates of ODP Volumes - Fiscal Year 1992

	Initial Reports Volume	Date to Printer	Date Distributed	Months Post-Cruise	*Scientific Results* Volume	Date to Printer	Date Distributed	Months Post-Cruise
OCTOBER								
NOVEMBER					122	9-91	11-91	39
DECEMBER	134	11-91	12-91	12	120 123	10-91 10-91	12-91 12-91	44 37
JANUARY								
FEBRUARY	135	2-92	3-92	12	125 126	12-91 12-91	2-92 2-92	34 32
MARCH	136	1-92	3-92	12				
APRIL								
MAY	137	4-92	5-92	12				
JUNE	138	5-92	6-92	12				
JULY					127 128	5-92 5-92	7-92 7-92	35 33
AUGUST								
SEPTEMBER	139	8-92	9-92	12				

August 1, 1991

ATTACHMENT 3

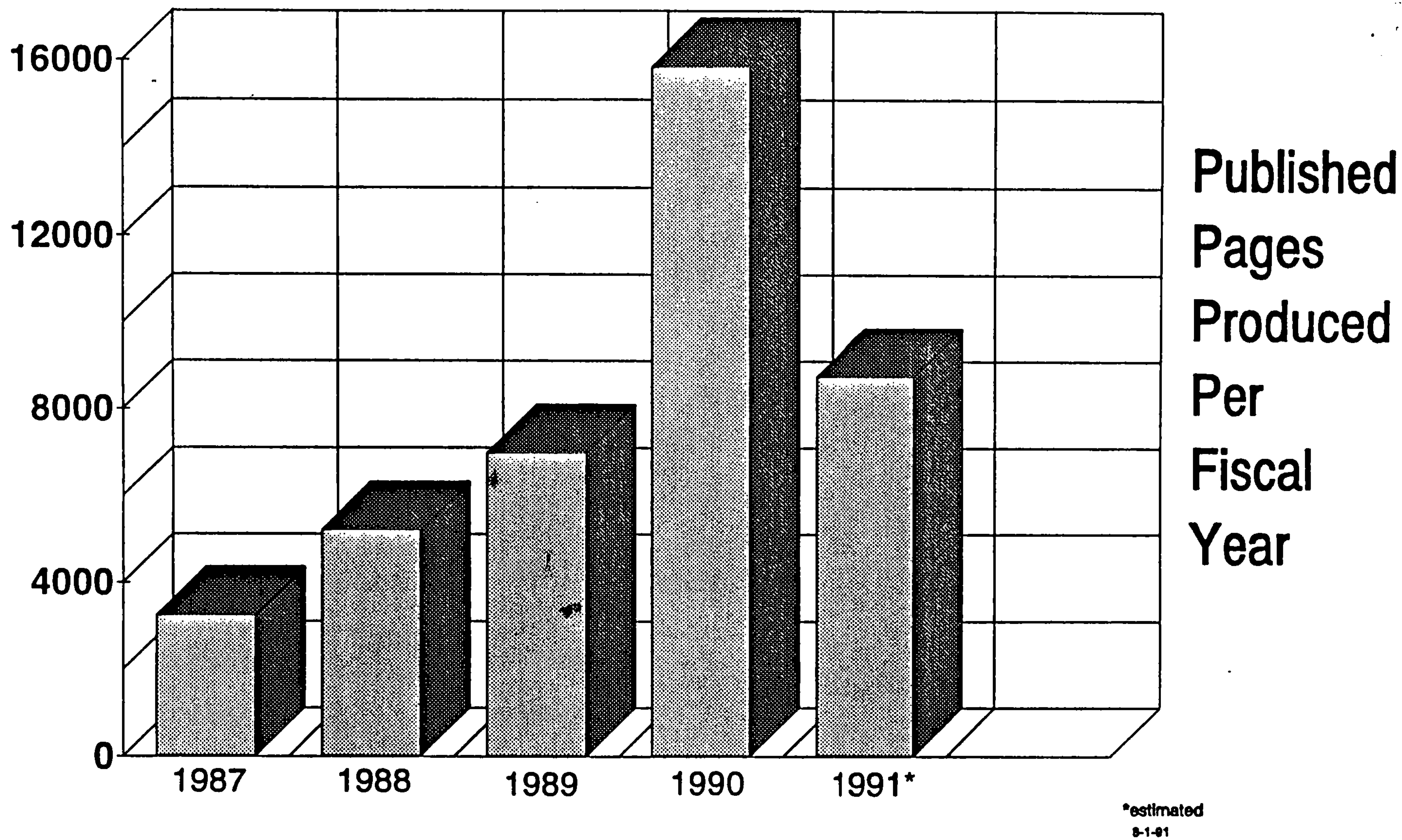


Proceedings Volumes Produced Each Fiscal Year

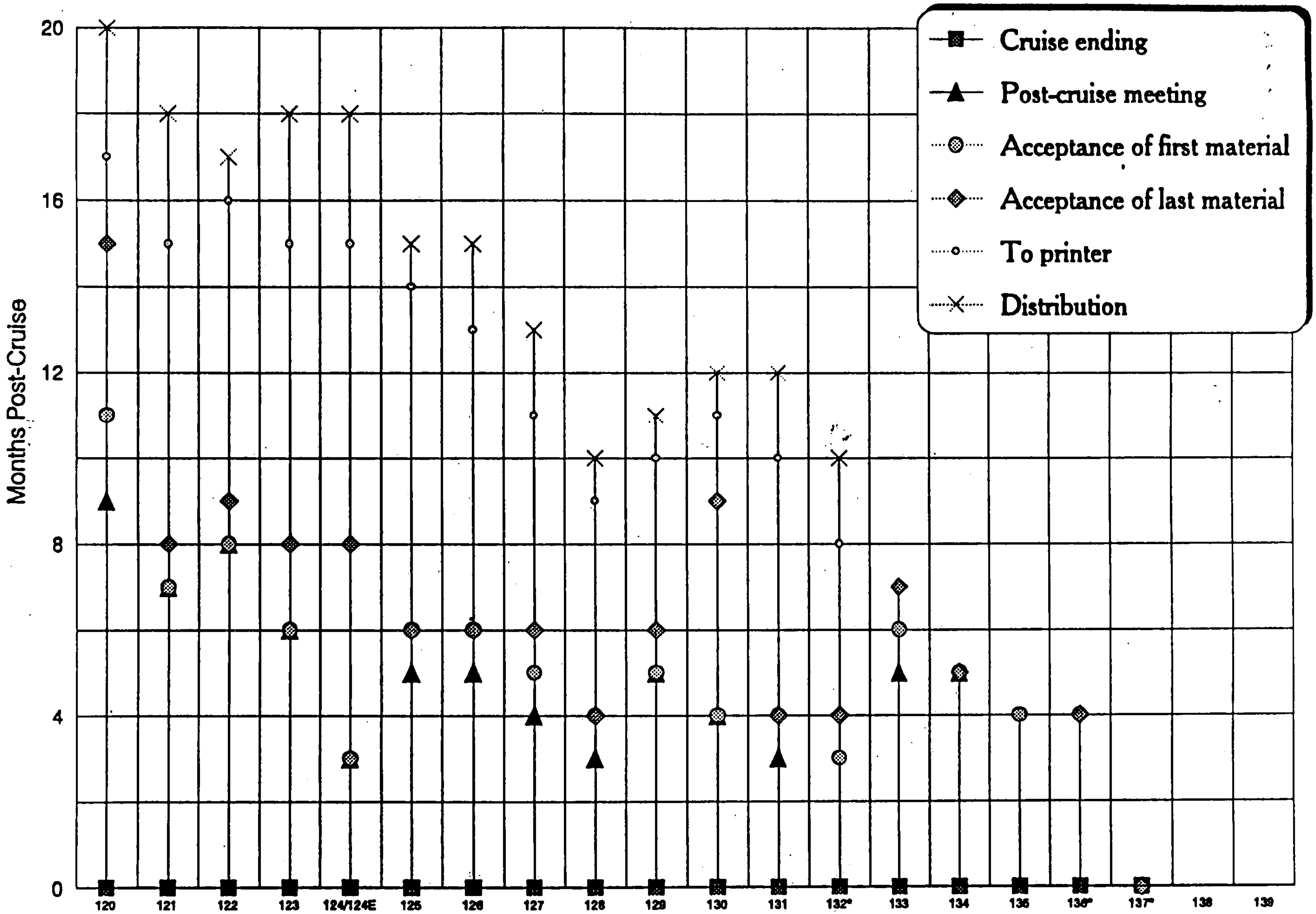
8-1-91

000209

ATTACHMENT 4



000210



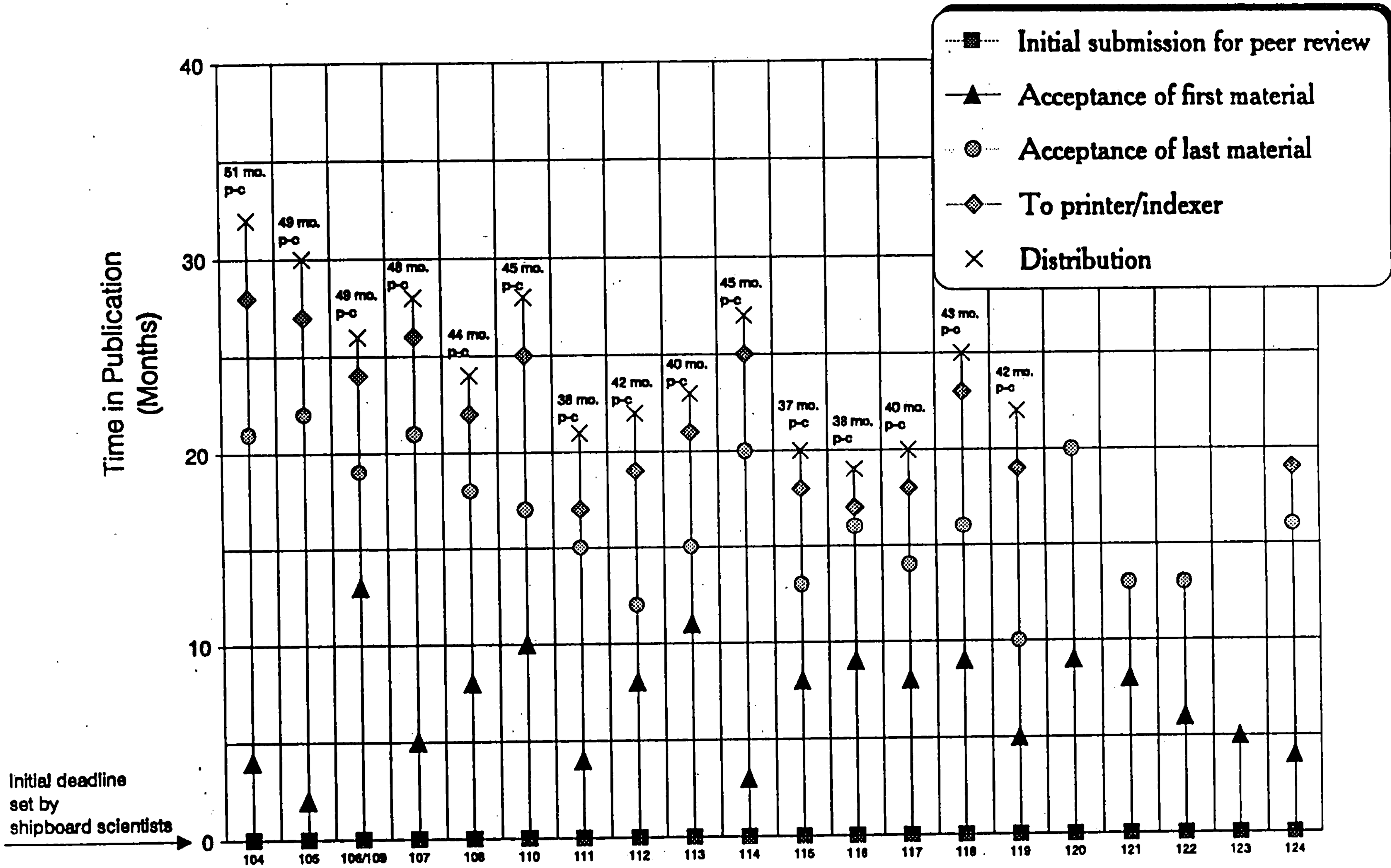
Production of ODP *Initial Reports*

*No post-cruise meetings held

8-1-91

000211

ATTACHMENT 6



Production of ODP *Scientific Results*

8-1-91

000212

ATTACHMENT 7

Key for Volumes 120, 122, and 124 IHP graphs:

○ Original specialty manuscript submission deadline (approx. 16 months, or 69 weeks, post–cruise)

◎ Original synthesis manuscript submission deadline (approx. 22 months, or 96 weeks, post–cruise)

△ Closing deadline for specialty manuscript submission (approx. 19 months, or 83 weeks, post–cruise)

Ⓐ Closing deadline for synthesis manuscript submission (approx. 22 months, or 96 weeks, post–cruise)

□ Final submission of specialty manuscript (if later than closing deadline)*

⊡ Final submission of synthesis manuscript (if later than closing deadline)*

■ Synthesis

▨ Data Report

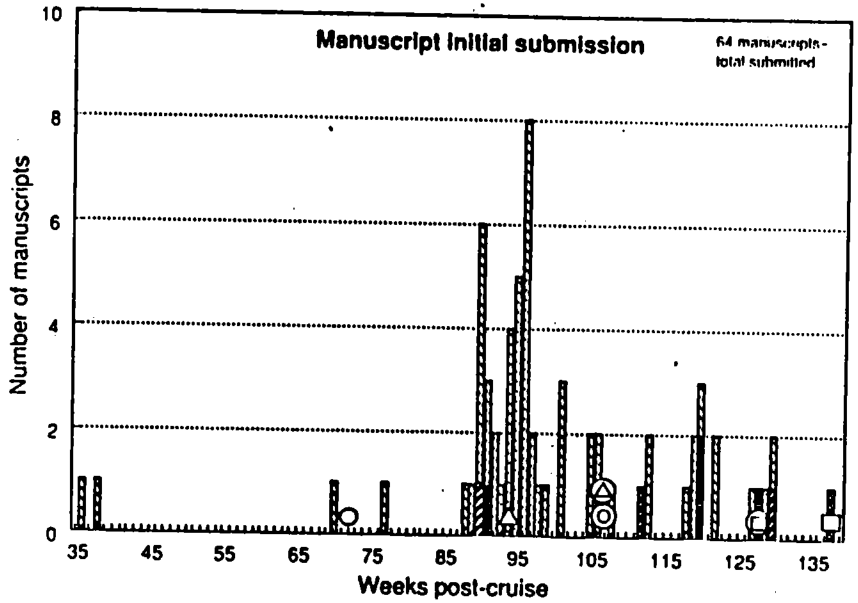
*Note: This is the latest submission that was allowed to the volume.

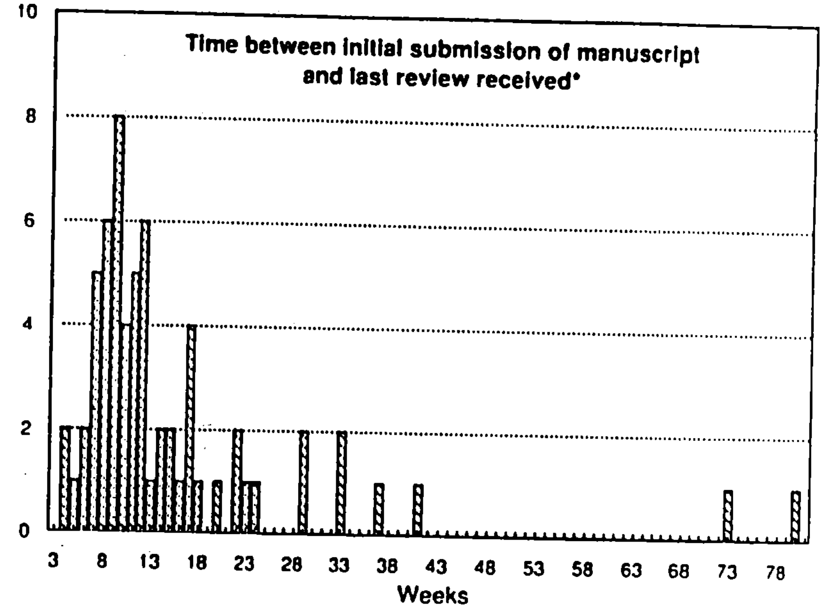
000213

ATTACHMENT 7

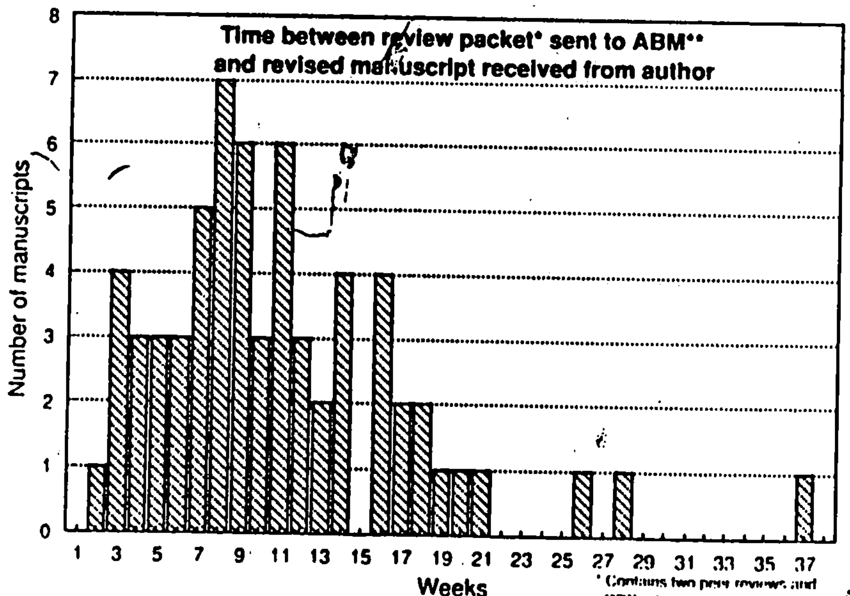
000214

Volume 120B

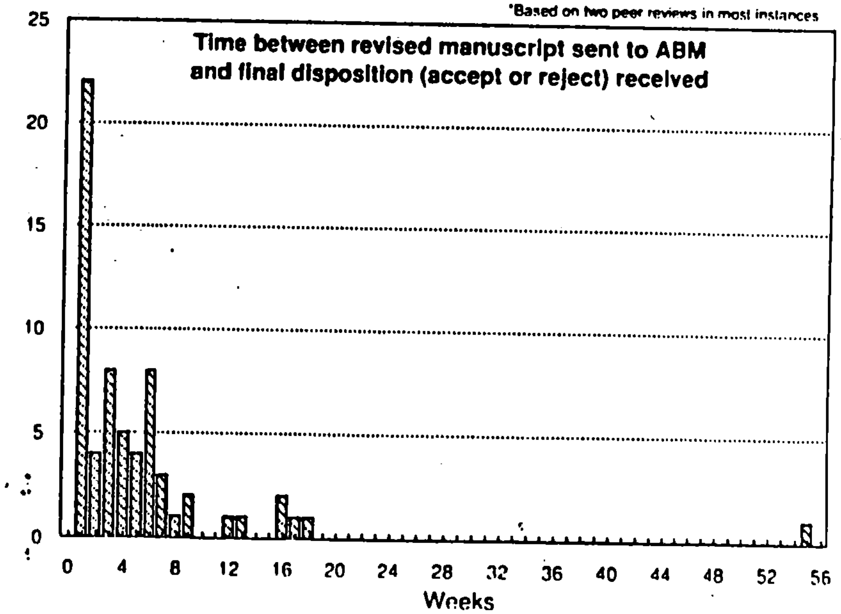




*Based on two peer reviews in most instances



* Contains two peer reviews and ODP editorial check
** Assigned Board Member



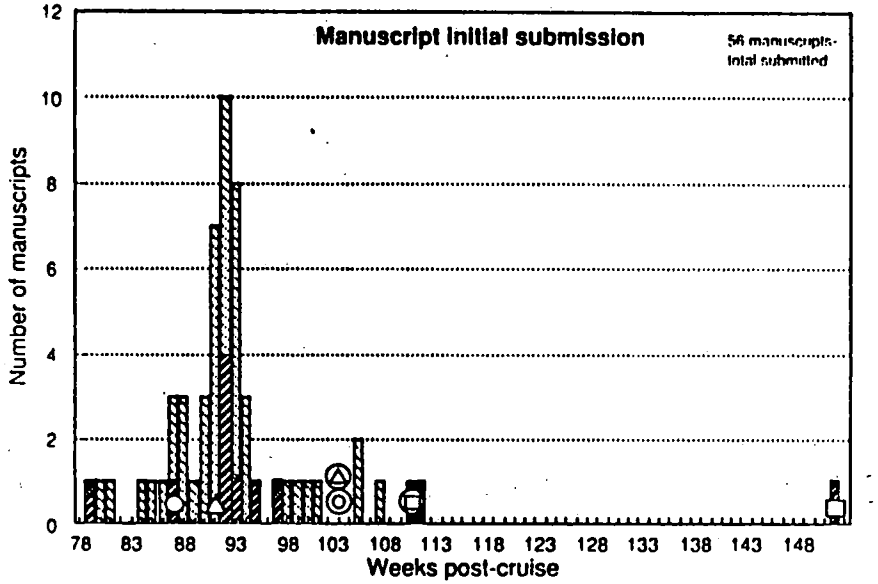
Leg 120 co-chiefs:
Sherwood W. Wise, Jr., Florida State Univ
Roland Schlich, Université Louis Pasteur

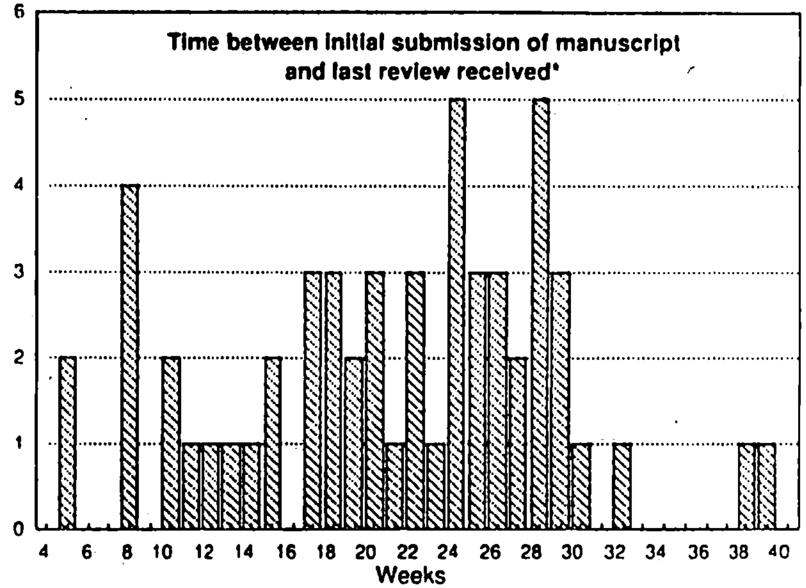
Cruise ending date:
30 April 1988

Post-cruise meeting
13 January 1989

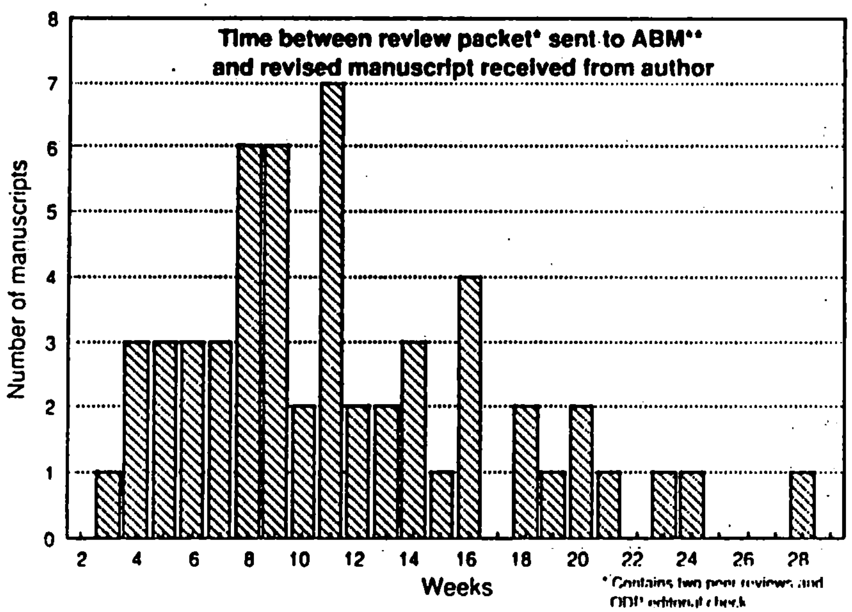
ATTACHMENT 7

Volume 122B



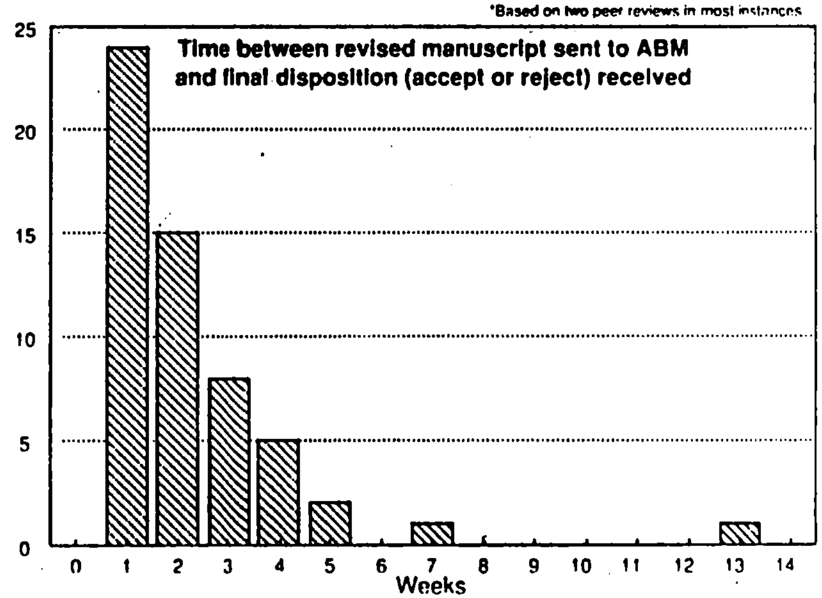


*Based on two peer reviews in most instances



* Contains two peer reviews and ODP editorial check

** Assigned Board Member



Leg 122 co-chiefs:
Ulrich von Rad, BGR, Hannover, Germany
Bilal Haq, National Science Foundation

Cruise ending date:
28 August 1988

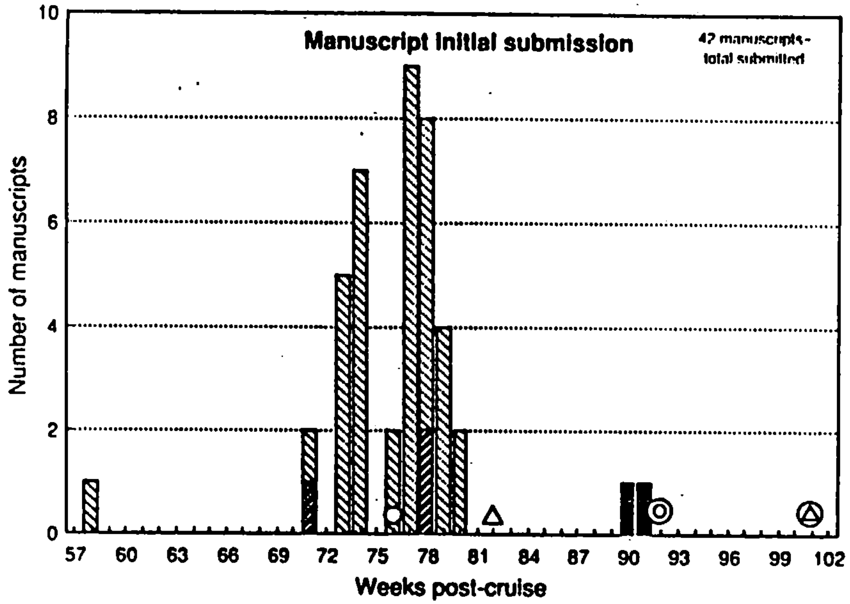
Post-cruise meeting
21 April 1989

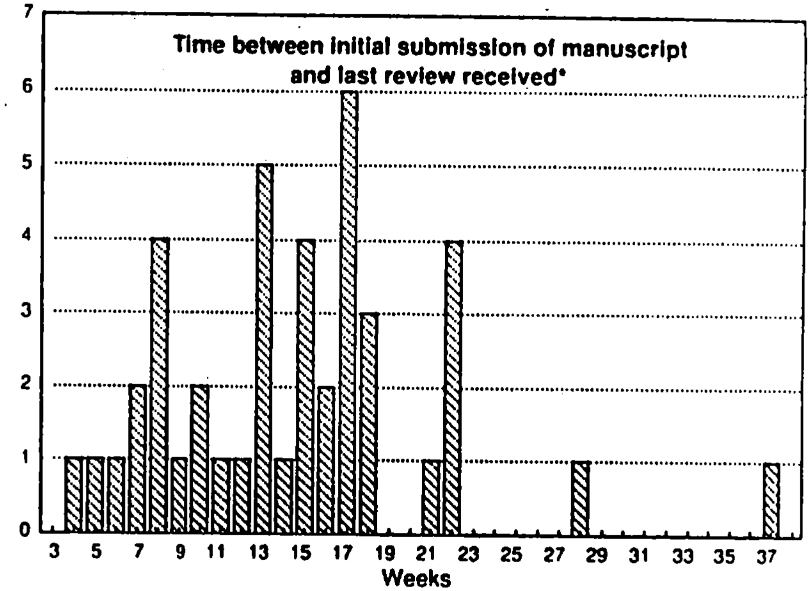
000215

ATTACHMENT 7

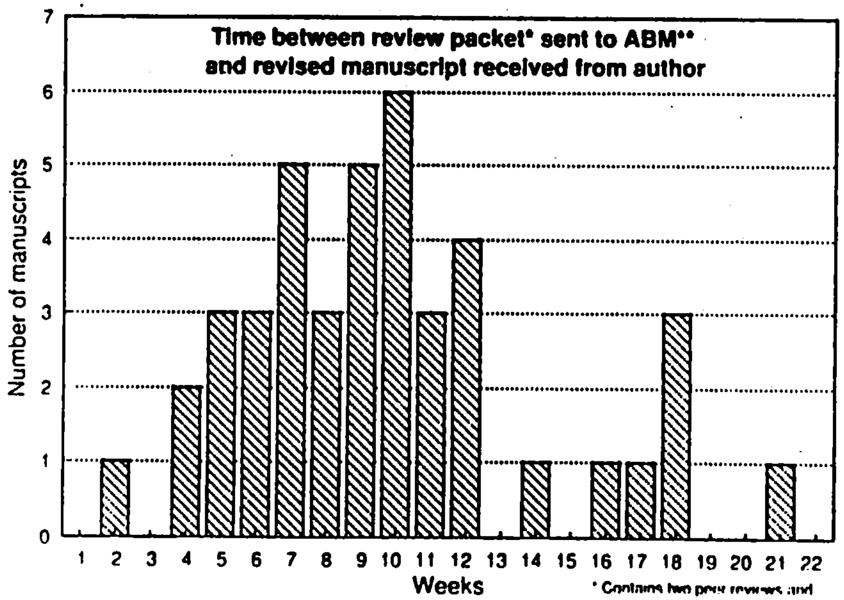
000216

Volume 124B



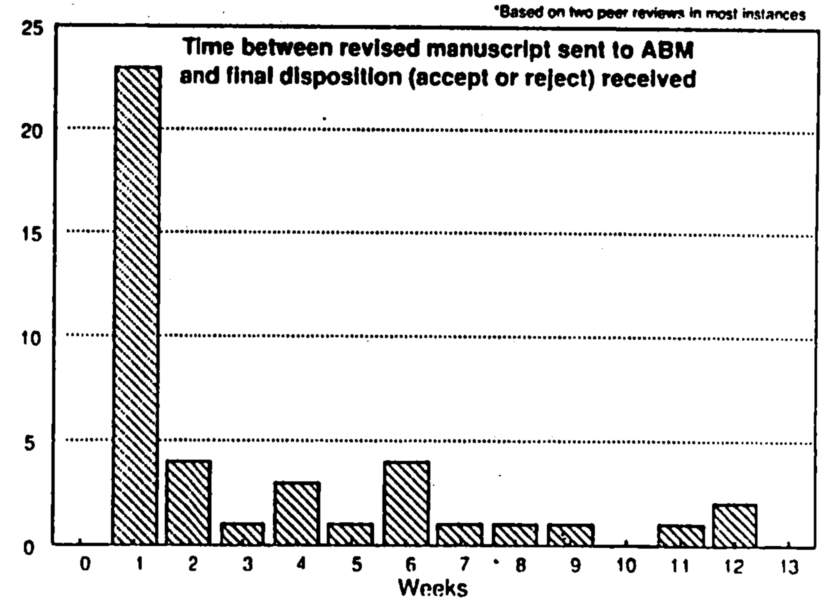


*Based on two peer reviews in most instances



* Contains two peer reviews and ODP editorial check

** Assigned Board Member



Leg 124 co-chiefs:
Eli A. Silver, University of California, Santa Cruz
Claude Rangin, Université Pierre et Marie Curie

Cruise ending date:
4 January 1989

Post-cruise meeting
16 June 1989

August 1, 1991

Summary of CSG Activity Since Last IHP Meeting

Since the last CSG report to the IHP, software development work has continued and the Repository Sampling Program has been completed. We view this as a significant accomplishment because while this application runs on a PC, software has been developed which permits real-time edit checks to be made to the Core Log database on the Vax as each record is entered. This capability is planned to be included in other new applications where needed, including the Shipboard Sampling Program which is currently under development for the PC.

It should be noted that as of this IHP meeting, the CSG reports will take on a new format. With the creation of the ODP Software Priorities Committee, the software development and enhancement projects are prioritized and assigned to various groups by the committee based on available resources. Therefore, only those software development and enhancement projects which are assigned specifically to CSG or in projects which CSG has a vested interest, such as the integration of the logging/corelog data, will be reported.

Since the Applications Completion Report has become several pages long, this report will now show only those projects completed within the past 12 months and will be renamed as the 'Task Completion Report'. The Task Status Report will reflect current software projects being worked on by CSG as well as on-going tasks which consume a great deal of CSG resources. The intent is to provide the pertinent information in a clear, concise format.

The computer user room modifications for use as a part-time classroom have been completed with good success. Several classes have been taught for Microsoft EXCEL and WordPerfect. The classroom has also been used by the Database Group to familiarize new members of that group in the use of the Vax system.

The upgrades to the shipboard PCs have been completed. The feedback received to date indicates that this upgrade is much appreciated.

000218

Computer Services Group
Task Completion Report for Past 12 Months
08/01/91

* - Completed since last IHP meeting

Application Name	Ship/Shore Usage	Status	Comments
Duplication of shipboard system ashore for testing	Shore		
- Phase 2: Installation and configuration of hardware and software to replicate shipboard system on shore		Complete	
CHECKLIST II (stratigraphic data entry and retrieval)	Both		
- Phase 1		Complete (contract)	Enhancement of commercial package and customization for ODP by author as consultant subject to ODP specifications and oversight: Import/export of ASCII interchange file, depth sort, extra output options, custom editing and camera-ready output.
Interfacing of MASSCOMP Logging Computer to VAX	Ship	Complete	Connection of Lamont Logging computer to Vax via ETHERNET for ease of data transfer.
Upgrade Vax Systems to Version 5.3 of Vax/VMS	Shore	Complete	Upgrade Vax systems to use version 5.3 of the VMS operating system.
Evaluate shipboard upgrade options for PCs to provide more capabilities	Ship	Complete	Upgrade shipboard PC compatible units with faster CPUs, more memory, and a graphical user interface (GUI) as requested by IHP at the March 1990 meeting.
Core Sample Inventory	Both		
- Phase 3A: Repository Sampling program REPOSAM linkage to Vax central data base for validation of leg, site, hole, sample id and depth of sample at data entry time.		Complete*	This phase completes the conversion of the Repository Sampling program from the PRO350 to the PC with all of the planned enhancements.
Upgrade Vax Systems to Version 5.3 of Vax/VMS	Ship	Complete*	Upgrade Vax systems to use same operating system as being used on shorebased systems
Upgrade shipboard PCs to provide more capabilities	Ship	Complete*	Provide faster CPU, more memory, additional software, and a graphical user interface.
Modifications to ODP Computer Userroom at ODP Headquarters.	Shore	Complete*	Modifications to ODP computer userroom and additional equipment added for teaching of 'hands-on' computer courses.

Computer Services Group
Task Status Report
08/01/91

Application Name	Ship/Shore Usage	Status	Expected Compl. Date	Comments
Core Sample Inventory	Both			
- Phase 4: Conversion of Shipboard SAM to PC with enhancements similar to those for REPOSAM		Development	January 1992	Application currently running on PRO350 and will be converted to IBM PC compatible unit.
- Phase 5: Installation of SAMUTL Vax Core Sample Database program at ECR and WCR		Pending	October 1991	Awaiting completion of User's Guide by the Repository Group and completion of shipboard testing.
- Phase 6: Further automation of residue and inventory tracking.		Analysis	To be determined	
- Phase 7: Implementation of bar code printing and reading for sample IDs.		Pending	To be determined	
Water Sample Temperature Probe (WSTP)	Ship	Analysis	January 1992	Software for temperature probe to be developed under Windows 3.0 environment on PC.
Physical Props (strength, index props, discrete sample GRAPE, velocity)	Both	Analysis	To be determined	Requests have been made for complete reanalysis, design, and development of the Physical Properties Data Collection application programs due to current system not performing as desired.
Paleontology Database Update Program	Both	Testing	To be determined	Loading of PC entered Paleontological data into S1032 data sets and post-processing. Further testing on hold pending acquisition of an acceptable data entry program.
Utility Libraries	Both			
Phase 2: Make CSG utility libraries available to users with appropriate documentation; supply other utilities as requested.		In Progress	To be determined	Documentation is being upgraded on a time-available basis.
Integration of Logging & Corelog data aboard the Resolution	Ship	In Progress	To be determined	This work is currently being done by the shipboard system managers. Refer to Appendix A and Appendix B.
Evaluation of alternate data base management systems	Both	Pending	To be determined	
Develop and Improve User Interface to Computers	Both	On-Going		
Development & teaching of computer courses for ODP computer users	Both	On-Going		Provide computer short-courses to ODP personnel on Vax,IBM,and Apple computers.
User software support and maintenance of micros	Shore	On-Going		User support for software applications, application installation, and maintenance of microcomputer hardware and peripherals.
Network Monitoring and Support	Shore	On-Going		Monitoring and correction to problems encountered on ODP LAN. Enhancements as needed to enhance operation and efficiency.

000220

Appendix A.

(TO REPORT FROM CSG)

000221

OCEAN DRILLING PROGRAM

INTEROFFICE MEMORANDUM

4 June 1991

TO: Tim Francis

CC: Jack Baldauf, Tom Janecek, Moses Sun, Bob Olivas, Dennis Graham, Bill Meyer, Rich Jarrard, Xenia Golovchenko

FROM: Audrey Meyer, Russ Merrill, Jack Foster, Lisa Patton, John Coyne

SUBJ: Request for funds from OPCOM for core-log data integration project

Introduction

Earth scientists are increasingly required to work with data measured at different scales and rooted in different subdisciplines. Integration of core and log data is an important component of the broader process of scale and subdiscipline integration in contemporary earth science. DMP, SMP, IHP, and recent shipboard scientific parties are united in their recommendation that ODP develop an ability to easily integrate coring and logging data onboard ship. A JOI workshop on Shipboard Integration of Core and Log Data, held in August, 1990, formalized the need to unify the logging and core laboratory datasets. A strawman strategy was proposed at the workshop in the effort to stimulate further discussion on the subject and to begin laying the groundwork for a solution to the problem.

It is indeed generally recognized that the integration of core and log data for shipboard use is of utmost importance and highly desirable for scientific interpretation aboard the Resolution. However, in order to provide the most efficient and effective approach to providing this capability, we recommend that an analysis of the overall ODP data bases and the associated data base management system be performed as part of this implementation. This should be approached in a professional manner with an appropriate amount of time being allocated to determine if the core and log data can be properly integrated in the desired manner. If core-log data integration is implemented without analyzing the overall situation, the end results may be somewhat less than expected. It could be that the capabilities which are required for the desired level of implementation may require different hardware and/or software.

After proper analysis of the existing data bases and development of specifications to meet the long-term needs as well as the immediate needs for the integrated data, we feel that core-log integration should be addressed in two stages: (1) through the integration of all core data; and (2) through the integration of core and log data; progress on addressing these stages could proceed in parallel. Item (1) was addressed to some degree during Leg 134, on which an effort was made to push the limits of the hardware, software, and personnel currently onboard the ship and see what was possible in the way of data integration at this time. During Leg 134, the shipboard systems manager and shipboard scientists used DataDesk Professional to assemble the various bits of core data [paleontology, lithology, MST data (GRAPE, p-wave velocity, and magnetic susceptibility), sedimentation rates, etc.] into a series of Summary Data Tables and Master Hole Columns. These data files were stored on the fileserver for use throughout the labstack. The MST data provided a reference depth scale for all core data. The resulting data tables and hole columns proved extremely useful in scientific interpretation during the cruise, and continue to be in high demand as a scientific tool in the post-cruise research ongoing now.

The Leg 134 experiment

The Leg 134 core-log integration experiment involved constructing three different types of datafiles: (1) lab-specific datasets; (2) summary data tables; and, (3) master hole columns. Characteristics and utilities of each of these datafiles are as follows:

(1) Lab-specific datasets: These datafiles represented the "best efforts" of shipboard scientists to filter and clean the data from their individual labs, and comprised the individual components of the Summary Data Tables described below. All the lab-specific data files of core data contained sub-bottom depths calculated from the CORELOG dataset. The lab-specific datafiles of core data were made available on the fileserver in two forms: (a) tab-delimited ASCII, which is readily uploaded to any spreadsheet or graphics package; (b) DataDesk Professional binary files which are used for exploratory data analysis (the unprocessed raw data were stored in the formal ODP datasets as usual for archiving by the ODP Database Group). Downhole logging data was also stored on the fileserver, in ASCII format.

(2) Summary data tables: The lab-specific datasets were merged to form a Summary Data Table for each site. These data tables were made available on the fileserver in both tab-delimited ASCII and DataDesk Professional versions, and they contained (a) a standard ODP sample identifier for each record; (b) a single reference depth for each record; (c) up to 60 columns of data from the various labs. Two characteristics of these data tables should be noted. First, to keep the summary tables to a manageable size, the parameters used when the data were collected were not included, but were instead archived in the individual datasets. Second, due to the high resolution of the MST data (2.5 cm), the depth of datapoints in the other datasets were shifted to the nearest MST datapoint depth, with a depth shifting window of 3 cm. Downhole logging data was added to the Summary Data Table for cross plotting in only one site; otherwise, it was maintained separately due to the different depth references used by the core and log datasets.

(3) Master hole columns: A template was made by the Shipboard Systems Manager which allowed construction of a lithologic column in near-real time for each hole drilled (see example in Figure 1). At the end of each work shift, the column was updated with the current information and posted for comments. This approach had two major shipboard benefits. First, many of the important controversies about the hole became apparent as it was being drilled; consequently, discussion and analysis of these issues began much earlier and were pretty well settled by the time the hole was completed. Second, the complete Master Hole Columns were enhanced with plots from the Summary Data Tables and formed the backbone figure for the Hole Summary reports.

What we learned from the Leg 134 experiment

Several problems, and recommendations to solve those problems, are evident from the Leg 134 experience:

(1) If integration of shipboard data is to become a routine function onboard ship, a second Shipboard Systems Manager needs to sail on each cruise.The Shipboard Systems Manager's responsibilities already require them to routinely work 13-15 hour days, and the added challenge of data integration cannot be accommodated under the current staffing levels.

(2) If integration of shipboard data is to become a routine function onboard ship, a member of the shipboard party should be sailed as a dedicated core-log correlation specialist on every cruise. Use of the master data files by Leg 134 shipboard scientists was severely limited to the time they had available after performing their routine shipboard assignments, and usually took place during their "off" hours. To insure proper data integration, a dedicated person (or persons?) needs to sail.

(3) A number of software tools are needed to facilitate the process of integrating the core and log data. These vary from simple tabulating programs already available "off the shelf" to more sophisticated filters, smoothing routine, and correlation tools that need to be written by someone knowledgeable about ODP needs. Producing these tools will be difficult--if not impossible--with the current programmer staffing levels at ODP/TAMU and LDGO/BRG. More people are needed to keep this project moving along at the speed which the scientific community wants it to progress.

(4) Due to the extremely large size of the datasets involved, specialized data processing workstations will need to be purchased which have large screens, very fast processors, large hard disks, and abundant memory. The Leg 134 experiment focused on the Macintosh (specifically, a Mac IIx) because it had the most complete set of available data processing tools. However, at times it took over 10 minutes for a large ASCII datafile to be uploaded into Excel, and more extensive processing power will be necessary in the future. In addition, we should expect this type of work to take place on both Mac and PC-compatible systems, and should be prepared to deal with this.

(5) Central to the entire question of integrating core/log data is the question of consistent depth measurement. We need to solve the problem of defining a single reference depth that spans the many different types of core and log data types collected on the ship. There are three components to this problem--establishing a consistent depth across the core data (which was estimated during Leg 134 by using MST depths as the reference depth), establishing a consistent depth across the logging data (which is done by running a natural gamma tool on all logging runs to cross-correlate the data from different runs), and correlating the core and logging data into a final reference depth dataset for the site (a tricky problem, not yet solved).

Our proposed plan for developing the capability for core-log data integration onboard ship

Building on the discussions at recent IHP, DMP, and SMP meetings, and at the JOI workshop on the integration of core and log data, we propose to do the following in FY92 (or earlier if funds are available) (Figure 2):

(1) Hold an initial workshop with participants from within ODP (ODP/TAMU and LDGO/BRG) and from the scientific community to address the problem of defining the reference depth to be used in correlating core and log data. Finding an acceptable working definition is essential to the correlation effort. This is something which must be agreed upon and accepted, else the integration effort will not be successful. Participants from the JOIDES community at these meetings should include representatives from DMP, SMP, IHP, and scientists on recent cruises who have attempted core-log integration on various scales.

(2) Hold two additional workshops, again with participants from within ODP (ODP/TAMU and LDGO/BRG) and from the scientific community, to do a detailed systems analysis and produce a user definition document for the core-log integration project. This would not only include a hardware acquisitions list and software development specifications, but would also include guidelines for how the system would be used onboard ship during a

"normal" cruise and recommendations for necessary technical and scientific staffing levels.

(3) After agreement is reached from the workshops and an agreed-upon set of specifications have been developed, the analysis of our current data base configuration will need to be made to determine if it is sufficient for the project or if new hardware and/or software are needed to produce the desired end result. This analysis will provide a list of additional items which may be required. It could result only in a reorganization of the data base structures of our existing configuration. An overall design document as well as an implementation plan for the core-log data integration should be a product of this phase also.

(4) Based on results of the design and implementation plan, proceed with procurement.of recommended items for core-log data integration. Several directions that this might take in FY92 include (a) continued development of the sonic core monitor, for downhole real-time monitoring of core recovery (project underway); (b) adding natural gamma sensors to the existing MST (project underway); (c) purchasing core-log integration specialist workstations; (d) developing an automated split core MST for digital imaging of core material (project on the drawing board, but which needs input from core-log data integration people); (e) purchasing any necessary "off the shelf" software.

(5) Software development can begin with the completion of the design document. Depending upon manpower availability and complexity of requirements, a phased approach may need to be used with the highest priority needs being developed first. If manpower needs permit, then it would be possible to develop software in parallel. For instance, a split-core MST could be developed while the core-log data integration was being developed.

<u>Schedule/funds required (nothing comes free)</u>

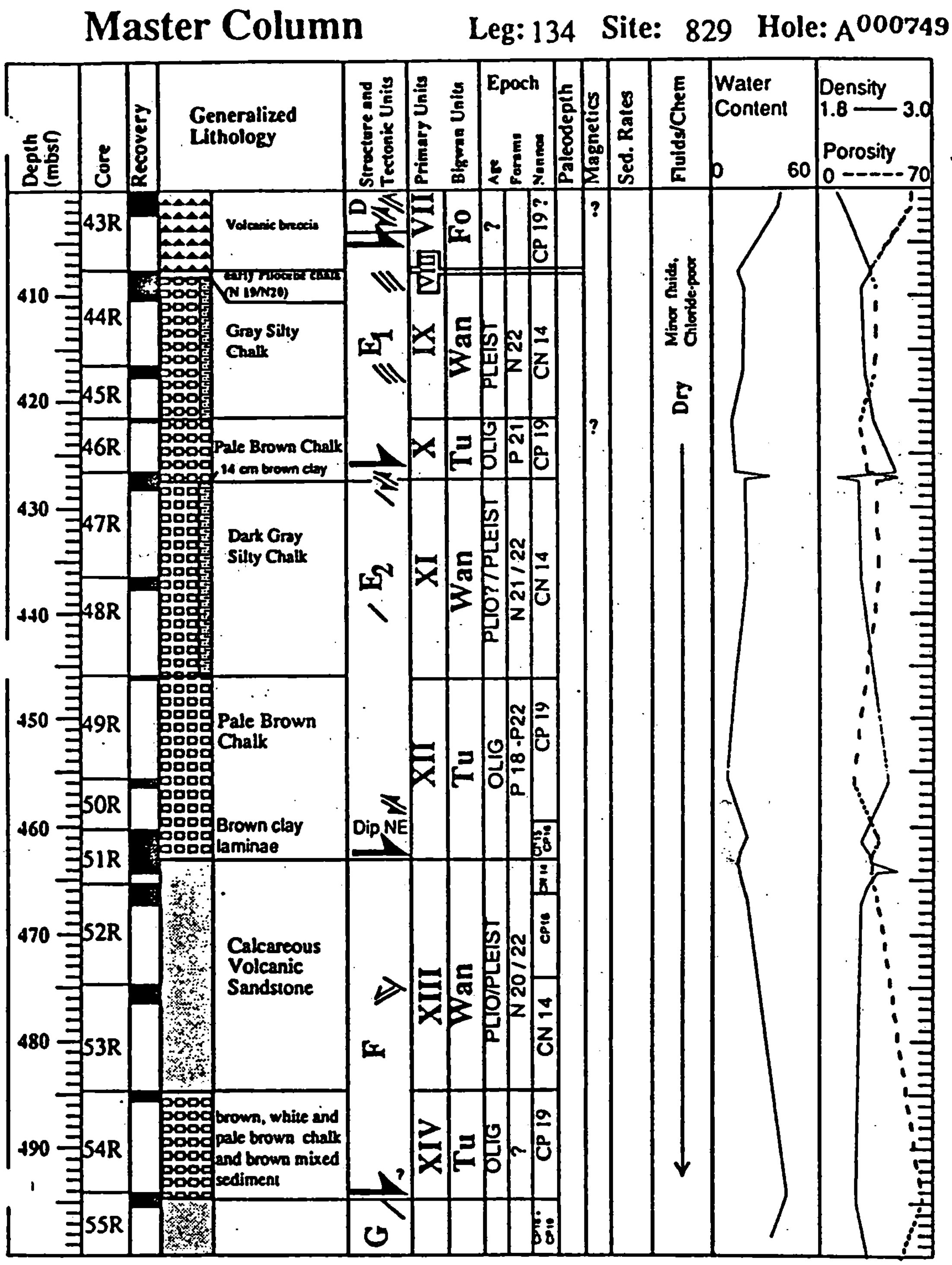
This project could be started as soon as funds were available. We are requesting a total of $290K for FY92-FY94.

Personnel: We propose to hire one systems analyst in FY92-94, plus a programmer to assist him/her in FY93. The systems analyst would be someone knowledgeable and competent in systems analysis, data base systems, client/server computing, geological type applications, network design, and software engineering; the programmer would preferably be someone familiar with data base systems. The systems analyst would work with the workshop participants and oversee the systems analysis and production of the user definition document. He/she would probably begin software development within FY92, and would interface with the programmer during the primary software development phase during FY93. Total costs for the two FTE's during FY92-94 would be ~$200K.

Meetings: We propose to hold three 2-day workshops during FY92, one to address the depth problem, one to do a detailed systems analysis, and one to refine a draft user definition document produced by the senior systems analyst. We would model them after the successful JOI workshop, and probably involve 6-10 participants from the international JOIDES community, plus members of the ODP/TAMU and LDGO/BRG staffs. Total costs, including travel and perdiem, would be ~$40K.

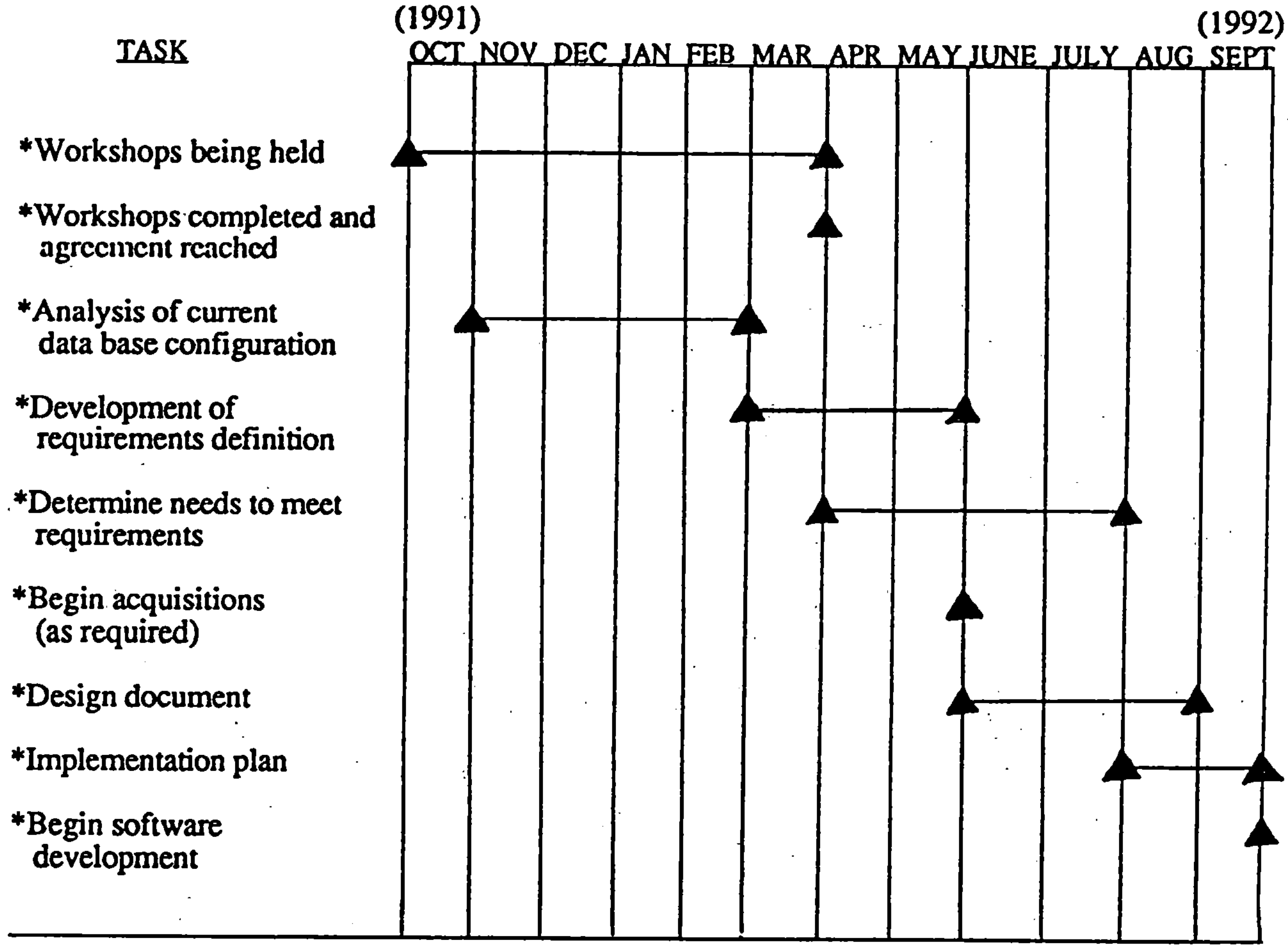
Hardware: We anticipate proceeding with at least some of the necessary hardware purchases during FY92. However, since we don't know what hardware will be requisitioned, it is difficult to make an estimate as to the funds that will be necessary. Perhaps $50K?

FIGURE 1: Example Master Hole Column from Leg 134



Last Modified on: Date Time

FIGURE 2: Estimated schedule for FY92 core-log data implementation[1]



[1]Assumes systems analyst and programmer hired by 1 October, 1991

Appendix B

(TO REPORT FROM OSG)

000228

000229

MEMORANDUM

August 2, 1991

To: Jack Foster

From: Dennis Graham

Subject: Core/Log Integration Status - Leg 138

Attached is a paper written by Bill Meyer written for the Society of Petroleum Engineers that details the status of Core/Log Integration as implemented on Leg 138.

cc. Bob Olivas

SPE 22993

Large Scale Integration of Core and Logging Data at the Ocean Drilling Program

by William Meyer, Ocean Drilling Program

Abstract

An effort is currently in progress at the Ocean Drilling Program to integrate downhole logging data with the core analyses performed in the laboratory. This process is intended to take place in near real-time during routine drilling operations. The results of this process are tables containing all measurements related to the borehole which are correlated to a single common reference depth. This matrix can be loaded into spreadsheets and other software packages for detailed examination by shipboard scientists. Because the data are correlated to a common depth scale, cross plots across the numerous data types are easily accomplished.

This paper will describe the progress made in the following areas:
- Data sharing via a networked fileserver.
- Common reference depths for core and logging data.
- Strategies for correlating core and logging data.
- Exploratory data analysis on integrated datasets.

References and illustrations at end of paper.

Background

The Ocean Drilling Program (ODP) is an international partnership of scientists and governments whose charter is to explore the origin and evolution of the earth through scientific drilling. Operations are conducted from the drillship JOIDES Resolution (SEDCO/BP 471). A seven story laboratory stack provides space and equipment for studies in sedimentology, paleontology, geochemistry, petrology, paleomagnetics, physical properties, and geophysics. Scientists from around the world participate in a continual series of cruises, each with its own unique scientific objectives. Texas A&M University serves as the Science Operator for the program.

There is a major effort underway at the Ocean Drilling Program to combine data derived from core analyses performed in the laboratory with downhole logs. The strategy for achieving this result involves special data collection techniques, computer hardware and software, and a set of data processing protocols which ensure that all components work together smoothly.

The problems inherent in correlating core data with downhole logs have been known for many years[1], but progress in this area has been slow in coming. Much of the work done to date in the area of core / log integration focuses on specialized algorithms which attempt to overcome the unique problems of a particular drilling situation. ODP has developed a methodology which enables the integration of core and log data in a wide variety of situations. This paper presents the highlights of this general approach. Each step in the process is discussed in detail, and supplemented with a case study describing a successful application of the method.

The integration of core and log data is of particular interest to scientists aboard the drillship JOIDES Resolution because it allows them to recognize and compensate for missing sections in the recovered material, and to determine *in situ* depths for core samples through the use of downhole log measurements. Logging data expands the database for each drill hole by providing a suite of high resolution measurements, many of which are impractical to make in the laboratory. Because logging data measures *in situ* conditions, it is useful in calibrating the lab-based measurements to downhole conditions. Finally, the correlation of downhole logs with laboratory core analyses opens up the possibility of matching core samples with seismic data. This technique has potentially far-reaching consequences both scientifically and in the petroleum industry. Using the procedures outlined below, downhole logs can be combined with the many other lab-based analyses performed on cored material.

Methods

The method used to bring core and log data together can be summarized as follows:

- Use advanced coring techniques to recover a continuous cored section.
- Use the Multi-Sensor Track (MST) to "log" the cored material in the lab.
- Use the MST data from each hole to direct drilling operations.
- Use core plug samples extensively in the labs.
- Maintain an active logging program.
- Correlate the Multi-Sensor Track and the downhole logs.
- Combine all the data from each drillsite into a Summary Data Table.
- Provide a computing environment encouraging further shipboard study.

The sections below discuss each of these steps in detail.

Emphasize a Continuous Cored Section

The recovery of a complete cored interval makes every subsequent step in the process easier. Consequently, considerable effort is expended towards this end. Many years of active research and development at the Ocean Drilling Program has produced a suite of coring tools suited to a variety of borehole conditions. These tools emphasize high core recovery and minimal drilling disturbance. Table 1 describes these systems and their applications. Using coring methods such as the Advanced Piston Core and Extended Core Barrel, ODP Leg 138 recovered over 99% of the 5.5 kilometers cored.

The Multi-Sensor Track

The Multi-Sensor Track was developed by the Ocean Drilling Program to provide a platform for whole-core continuous measurements in the lab. The system consists of a mechanical track which moves a 1.5 meter section of whole-round core through sensor devices under computer control. The current design accommodates up to eight different sensors. Three sensors are currently in place; GRAPE (Gamma Ray Attenuation and Porosity Evaluator), compressional P-wave velocity and magnetic susceptibility. Each section of cored material is analyzed on the MST for these measurements. The resolution of the readings varies with the sensor and the selected track speed, ranging from 2.5 cm for the GRAPE to 10 cm for magnetic susceptibility. Cores are run on the MST as soon as they are recovered. The resulting measurements are plotted as each section is run then archived for further analysis. Figure 1 shows the MST in schematic form.

Two of the fundamental problems in integrating Core and Log data are the bias and scatter inherent in sampling discrete plugs from cored sediments[2]. The MST system overcomes these problems by providing high resolution measurements on a nearly continuous basis from the cored sections. Another concern in the correlation of core and logging data is smoothing[3]. It is usually necessary to smooth core plug data before attempting to correlate it with logs due to the large differences in sampling rate between the logs and the plug analyses. The use of the MST alleviates this need by providing an intermediate reference between the plug samples and the downhole logs. The log-like character of the MST data allows it to be compared directly to the logs. The plugs are taken from the core sections after they have been measured on the MST and are thus accurately placed in the section once the logs and MST measurements have been correlated.

The Multi-Sensor Track alleviates the worst of the problems normally encountered in matching core and log data. In essence, the MST provides a set of logging measurements on the cored material, while the downhole logging tools record the characteristics of the borehole wall from which the cores have been removed. These complementary signals may be correlated in a straightforward manner, providing a direct link between the logs and the core plug samples.

Correlate MST to create a composite section

Even when high coring recovery is achieved, the cores may be discontinuous due to the heave of the ship, hole instability, and other uncontrollable factors. When complete recovery is considered essential, several boreholes are drilled to ensure an overlap in the data. The MST records from each hole are correlated visually to ascertain which intervals are missing. This correlation is usually straightforward as the cores are contiguous and the approximate depth of each core is provided by the drillers. A vertical offset is scheduled into each new borehole ensuring that the overlap will cover those intervals previously missed.

Once all the holes at a site are complete, the MST records are combined into a single composite sequence which uses cores from all the holes to create a single continuous record. This high resolution data series is then used to place all the plug samples in the composite record.

Analyze the core plug samples

After each 1.5 meter cored section has been measured on the MST, it is split in half along its length. Plug samples are then taken for further shipboard analysis. Over twenty different types of analysis are routinely performed in the shipboard laboratories. Where possible, the same core plug is used for several different samples allowing those measurements to be cross plotted directly. Table 2 summarizes the analyses routinely performed on core plug samples.

Lamont Doherty logging program

Logging operations are conducted by the Lamont Doherty Borehole Research Group under contract from ODP. Table 3 shows the logs available on the ship and the purpose to which each is best suited.

Once the logs are collected, several depth adjustments may be performed. In general, the maximum vertical resolution of the logs is on the order of 15 cm, determined primarily by cable stretch and the sometimes uneven motion of the logging tools up the hole. The vertical extent of the borehole measured by each logging tool varies depending on the tools' response characteristics and detector separations[4].

A natural gamma tool is included in each logging run. This measurement provides a common signal for correlating the runs to each other. After the natural gamma curves from each logging run have been matched, the entire suite of logging runs is depth shifted to match logging traces with the major lithologies observed in the borehole. In this manner, lithologic features are used to relate log depths to sub-bottom depths.

CORRELATE MST WITH THE DOWN HOLE LOGS

Once the core analyses have been performed and the logging runs are completed, our attention shifts to the correlation between these two datasets.

Although many algorithms have been proposed for correlating core and log data[5], most are limited to almost ideal conditions, and no one technique has proven to be effective under all circumstances. We rely primarily on the skill of an experienced Integration Specialist who visually ties major lithologies together using the Density Log (LDT) data as a reference signal and adjusting the MST GRAPE depths as necessary. Shifts in the GRAPE depths are applied to all core measurements via the Summary Data Tables.

Several sub-bottom depth scales are used during the course of the cruise, each encompassing a broader view of the available data. Initially, a sub-bottom depth is assigned to each cored section based on the drillstring length at the time the core was taken. This depth is used to locate all measurements made within a single borehole.

As subsequent holes are drilled at the same drillsite, composite depth scales are developed which shift the cored intervals with respect to overlap, drilling problems, and missing sections. The composite depths also account for the expansion of cored material which results from the sedimentary overburden. These composite depths are used to establish a common reference between data from multiple holes at the same drillsite.

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Finally, the composite section is depth adjusted based on the logging results. These transformations may include depth shifts, to match the cored record to major lithologies observed in the logs, and depth distortions (stretching and squeezing) to match sections of the composite core records to the logs. In general, the correlation of MST and log data is straightforward. After major lithologic changes are identified and matched, an iterative process of automated and visual correlation is continued until the desired match is achieved.

MAKE THE DATA AVAILABLE THROUGHOUT THE LAB

At each step in the process of collecting and processing shipboard data, the results are made available to the scientific party. This is accomplished through the use of a sophisticated shipboard computer system and extensive networking.

The heart of the shipboard computer system are three VAX minicomputers configured as a loosely coupled VAXcluster. These systems provide abundant power for database or other CPU intensive tasks. The VAXcluster also manages large system peripherals and 6.4 gigabytes of online disk storage.

Individual scientists work on the Macintosh or PC compatible microcomputers located throughout the shipboard laboratories. These systems use the shipboard internet to share data and access networked laser printers. Decnet, TCP/IP and LocalTalk networking protocols are supported over an ethernet backbone.

Networked fileservers are critical to the success of our data integration program because they allow data to be readily shared between labs. This enables researchers to review the current results throughout the labstack and easily attempt cross-disciplinary studies. Figure 2 shows a schematic representation of the shipboard computer system.

THE SUMMARY DATATABLES

The Summary Data Table for each drillsite combines all the data collected in a tab-delimited ASCII-format matrix that is easily loaded into a wide variety of data analysis programs. With MST measurements every 2.5 cm, a 400 meter hole produces a data table containing 16,000 rows. If all the analyses from each laboratory are added to the table (over 60 columns) the resulting file is well over eight megabytes in size.

Due to the volume of data contained in the Summary Data Tables we have found it necessary to search out advanced analytical tools in order to fully utilize this resource. Most spreadsheets have difficulty opening files this large and dedicated statistics or graphics programs lack the breadth and flexibility needed. Exploratory Data Analysis applications which link statistics, graphics and database functions facilitate the use of the Summary Data Tables. These programs help the researcher identify patterns in a powerful and intuitive manner.

The term Exploratory Data Analysis was coined by John Tukey of Princeton University in his book of the same name. Tukey questioned the traditional approach to statistical analysis of forming a hypothesis, collecting data and finally testing the hypothesis. He suggested instead that the analysis of data be approached by building each step of an analysis upon the knowledge gained from earlier steps. This iterative approach allows the underlying patterns in the data be revealed as successive layers of random fluctuations and errors are stripped away. To provide an environment conducive to this methodology, Tukey proposed a suite of software tools which support a free-form intuitive interaction between the analyst and the data.

Recently Exploratory Data Analysis programs have become available on microcomputers and ODP has selected DataDesk Professional (Odesta Corp.) for use on the shipboard Macintosh workstations. DataDesk has proven ideal for examining the Summary Data Tables by combining the following features.

- Easily and quickly handles large files
- Combines graphics, statistics and database functions in one program
- Highly visual and intuitive user interface
- Analytical results easily transportable to other programs.

After the analysis is complete, the results are transferred to KaleidaGraph (Synergy Software) for publication quality plotting. Figure 3 shows a DataDesk analysis in progress.

A CASE STUDY

On ODP Leg 138, in the eastern equatorial Pacific, many aspects of the method were routinely applied. MST plots from each cored interval were were used to direct the ongoing drilling operations. As subsequent holes were drilled, the MST data from each hole was correlated to form a composite record which was then correlated with the logging data from the holes. Three illustrative examples from the process are presented below.

SITE 844 MISSING INTERVAL

The first example shows MST-GRAPE records from several boreholes at Site 844. As the drilling proceeded, GRAPE data was plotted and the trace from each core depth-shifted to create a single composite signal. Figure 4 shows several cores from holes 844-B, 844-C, and 844-D as recovered. Cores 2, 3, 4, and 5 from hole 844-B are plotted at their actual GRAPE densities. Core 4 from hole C and core 1 from hole D have been shifted 0.4 g/cm3 for clarity. Note that the records for cores 844-B-3 and 844-B-4 appear to be similar. This suggests that the same depth interval was cored twice. Because this problem was noticed quickly, subsequent drill holes allowed the missing interval to be recovered and added to the composite record. The lower chart on Figure 4 shows the same cores depth-shifted to create a composite record. Core 4 from hole 844-B has been shifted to show the match with Core 3. This composite record allows plug samples taken from any of the cores to be placed within the lithologic column of Site 844.

Site 844 Log vs. Core Density

Figure 5 shows the composite GRAPE record correlated with the downhole logs and the wet-bulk densities measured from plug samples. The overall character of all three records matches well although consistent variations in the values can be observed.

These differences may be attributed to the compressional state of the three samples. The plug samples are measured in an uncompressed state and consistently show the lowest densities. The log densities reflect *in situ* sediment compression and, consequently higher densities. The GRAPE measurements are made on whole-round cores which are contained in the butyrate core liner. Cored material in this state is the most highly compressed, combining *in situ* sediment compaction with the stresses induced by the drilling process. In addition to these factors, uncorrected GRAPE values display an upward density bias resulting from an artifact in the GRAPE calibration itself. This bias is higher in low density samples[6].

This explanation is supported by the observed convergence in density values beginning at 225 meters when the drilling method was changed from Advanced Piston Core to Extended Core Barrel (a rotary drilling process).

Exploring the Dataset

Figure 3 shows a typical DataDesk analysis in progress. This investigation considers the correlation between GRAPE and core plug values for wet bulk density. The combination of chart types and integrated statistical analysis provide several views of the problem.

Future Directions

The methodology described above makes possible the complete integration of all data from a drillsite. The data is correlated to a common depth datum and interdisciplinary correlations are easily explored. Log data may be confidently plotted against analyses performed on plug samples or the Multi-Sensor Track. With this framework in place, the focus is shifted to expanding the scope of the measurements collected so as to complement the analyses already in place.

Additions to the Multi-Sensor Track

An obvious addition to the Multi-Sensor Track would be a transverse GRAPE sensor oriented 90 degrees to the existing unit. Comparisons between the two signals would allow anisotrophy studies as well as providing more reliable density measurements.

Another potentially rewarding direction involves the development of split-core Multi-Sensor Tracks which would be used on the half-round sections before plug samples are taken. A split-core system will greatly expand the realm of high resolution continuous sampling.

A spectral densitometer MST sensor will measure cored material with respect to spectral changes in the blue, red, and near infrared bands. Data from the device will be used to determine many sedimentological properties. This device also paves the way for quantifying core color determinations and holds promise in the area of sedimentary composition studies based on spectral densities. A split-core color system of this type was used on Leg 138 providing another signal for inter-hole and inter-site correlations.

A digital imaging system would allow discrete closeup color images to be made of the cored sections through the

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use of a video camera and digital imaging software. Images made in this manner could be used for the study of sedimentary structures, color logging, and pattern recognition. A prototype digital imaging system is under development by the Ocean Drilling Program and was in use on Leg 138.

A prototype Resistivity device which could be adapted to MST use was demonstrated on Leg 133. In addition to its intrinsic interest, this measurement would provide another point of correlation with the formation microscanner (FMS), a logging tool combining downhole imaging, resistivity and dipmeter measurements.

The Sonic Core Monitor

The Sonic Core Monitor, which is under development by ODP, measures the amount of core recovered as the drilling proceeds. In addition to providing the Driller with feedback on drilling techniques, this allows the incoming material to be accurately located in the core once it is received at the surface. A prototype of this device has been tested and is being refined for routine use.

Summary and Conclusions

Development continues on a method which allows the integration of core and logging data aboard the JOIDES Resolution. The use of the Multi-Sensor Track to log sediment cores avoids many of the problems inherent in plug sampling and allows a straightforward correlation with downhole logs. The resulting composite datasets are distributed to shipboard scientists in the form of Summary Data Tables. These comprehensive data files are further analyzed using Exploratory Data Analysis techniques. Future developments include components designed to complement the existing measurements and broaden the scope of the method as a whole.

Acknowledgement

This paper would not have been possible without the knowledge, cooperation and patience of the Leg 138 scientific party. In particular, the author wishes to thank Larry Mayer, Nick Pisias, Tom Janecek, Mitch Llyle, Teri Hagleberg, and Ron Grout for their comments and assistence.

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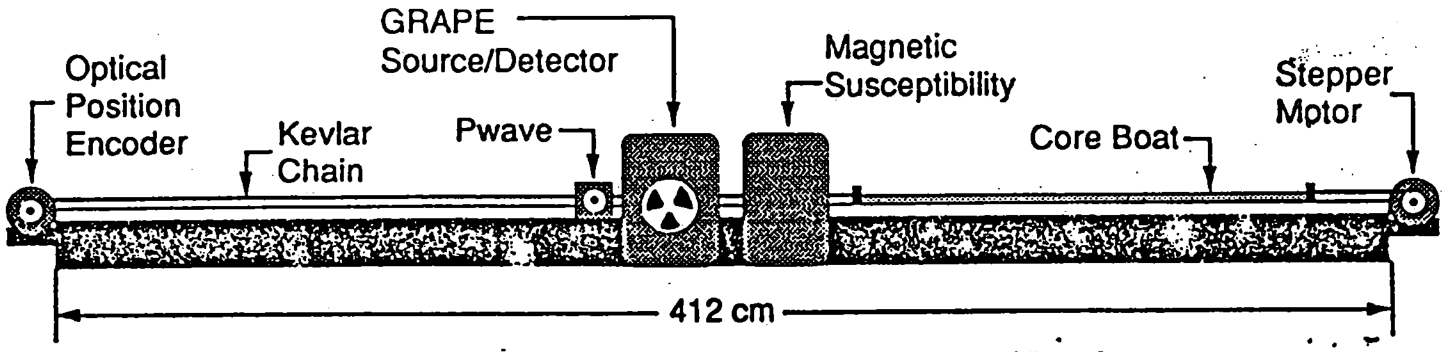

Figure 1 - The ODP MultiSensor Track

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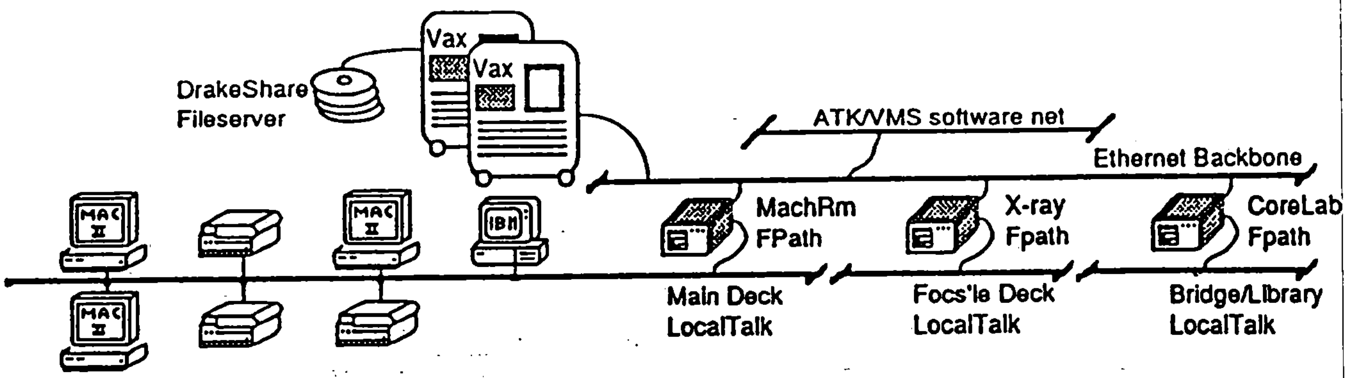

Figure 2 - The Resolution InterNet

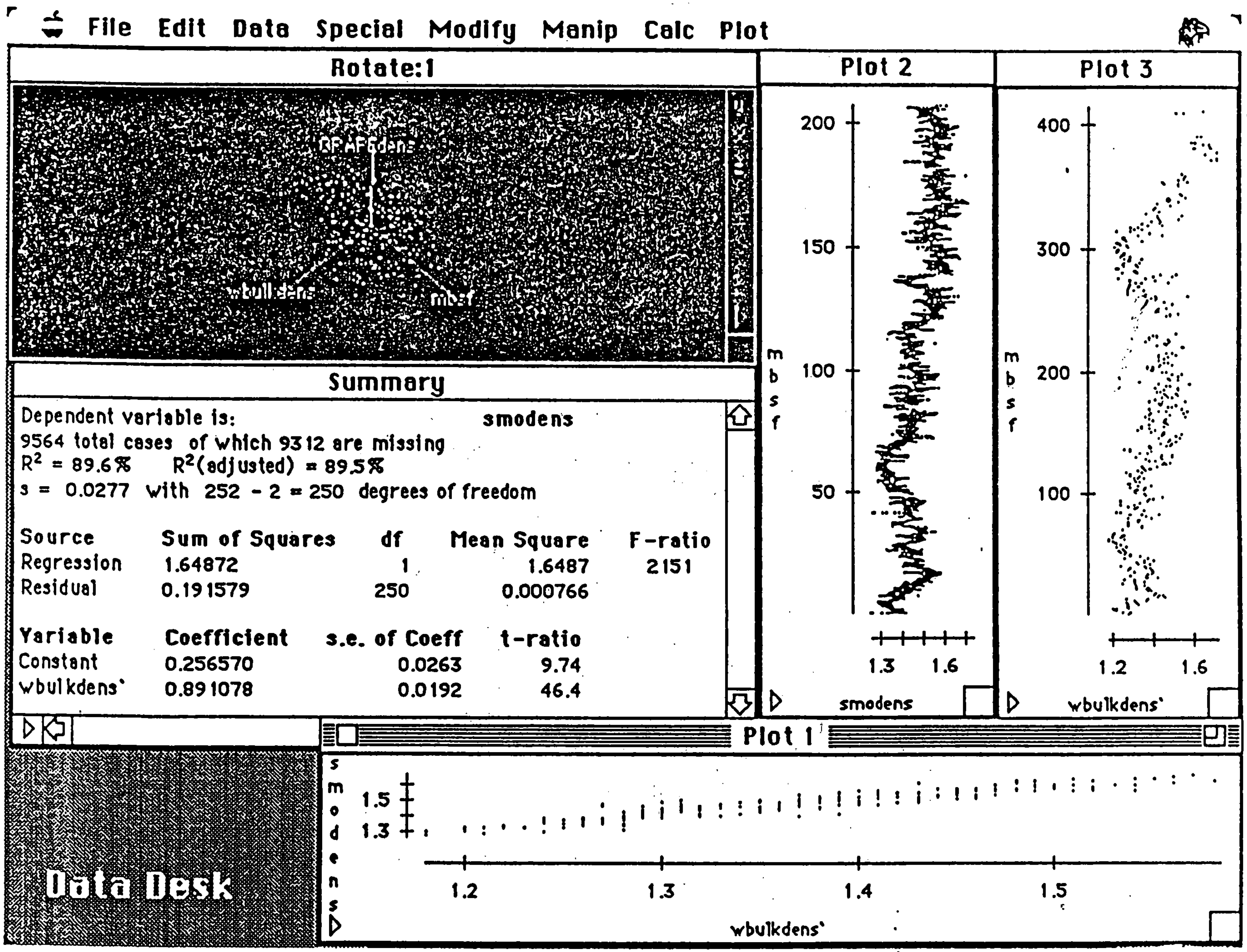

Figure 3 - Exploratory Data Analysis

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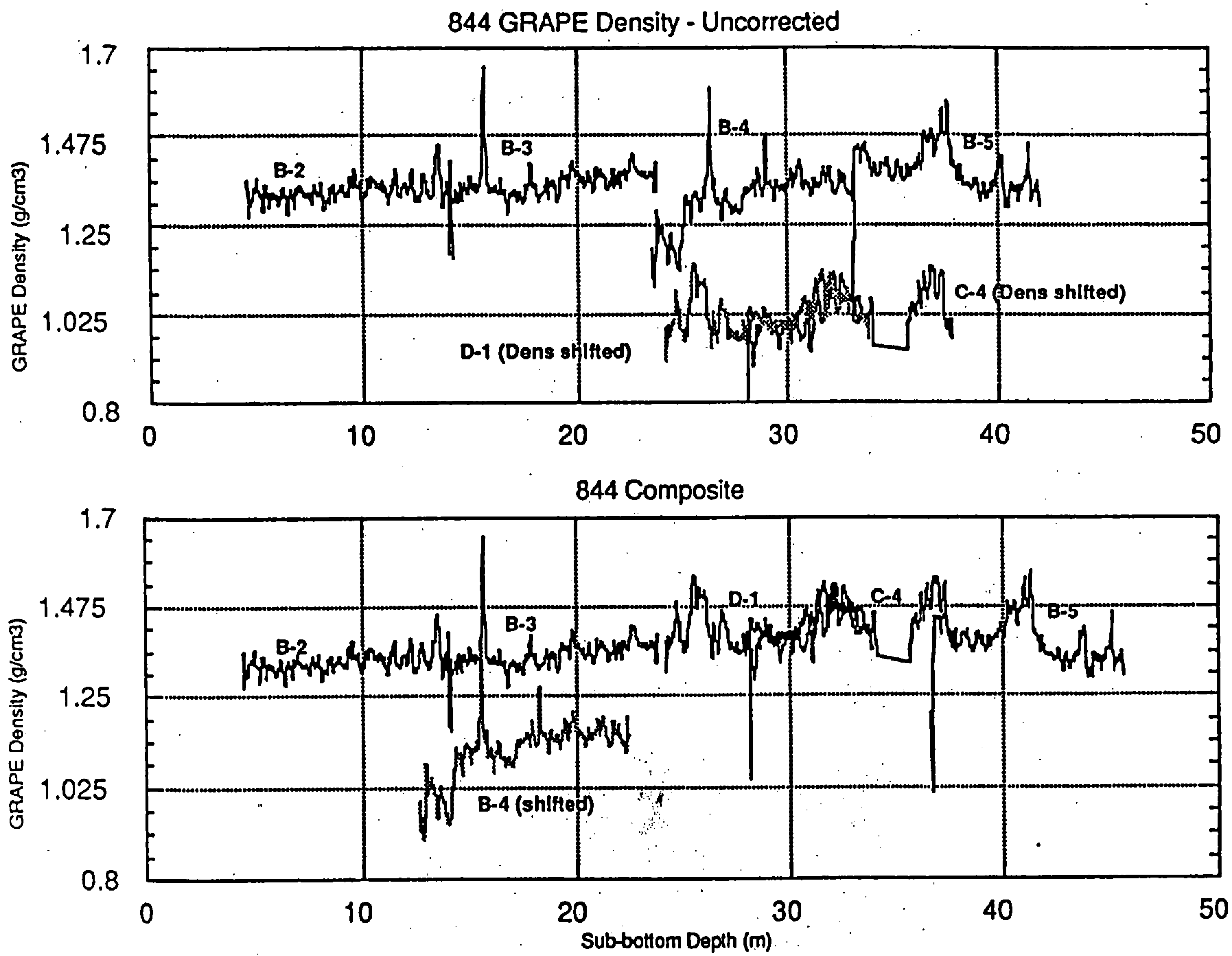

Figure 4 - MST Correlation

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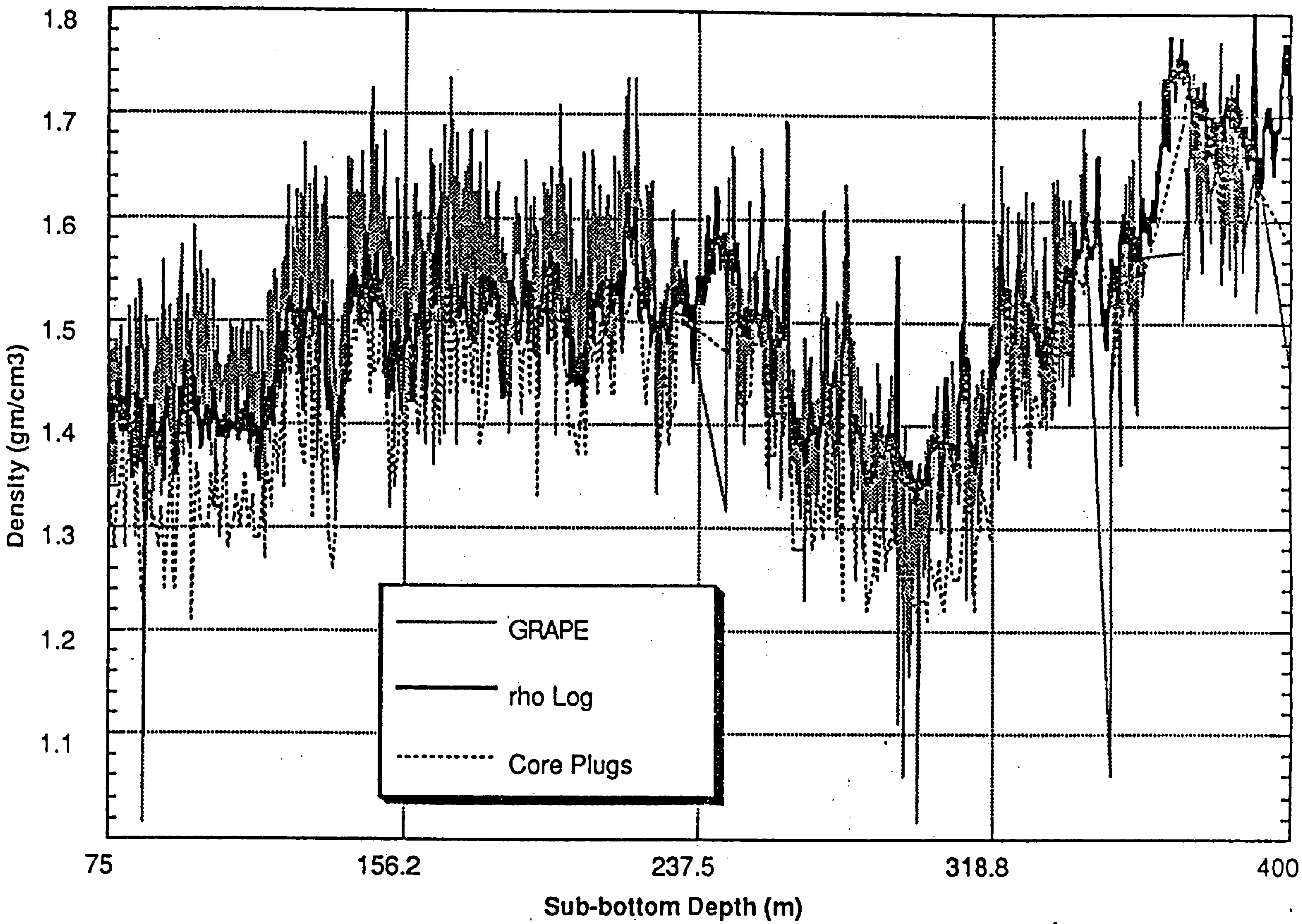

Figure 5 - Site 846 GRAPE / Log / Plug - Density Comparison

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Table 1 - Scientific Coring Methods

Tool Name	Purpose
Rotary Core Barrel (RCB)	Recovers medium-to-hard crystalline sediments.
Advanced Piston Corer (APC)	Recovers soft ooze and sediments.
Extended Core Barrel (XCB)	Continues coring in firm sediments after poston coring is no longer effective.
Motor Driven Core Barrel (MDCB)	Recovers interbedded materials, hard and fractured rocks.
Pressure Core Sampler (PCS)	Recovers core at in-situ pressures up to 10,000 PSI.
Vibra Percussive Corer (VPC)	Uses percussion and vibration to recover unconsolidated sediments.

Table 2 - Routine Shipboard Analyses

Lab	Dataset	Contents	Fileserver Reports	Summary Datatables
Corelab	Corelog	Drilling Logistics	Y	N
Physical Props	Index	Bulk density, Grain density, Porosity,Water content, Void ratio	Y	Y
Physical Props	Velocity	Discrete sound velocity	Y	Y
Physical Props	Strength	Shear strength	Y	Y
Physical Props	GRAPE2	Discrete GRAPE (Two minute count)	Y	Y
Physical Props	Thermcon	Thermal Conductivity	Y	Y
MST	GRAPE	Continuous GRAPE	Y	Y
MST	PWAVE	Continuous sonic velocity	Y	Y
MST	Susc	Continuous magnetic susceptibility	Y	Y
Magnetics	DSS	Discrete cryogenic	N	N
Magnetics	SUS	Discrete susceptibility	N	N
Magnetics	WCC	Continuous cryogenic	N	N
Description	SLIDES	Smear slide description	Y	Y
Description	HARVI	Hard rock description	Y	Y
Description	HRTHIN	Thin section description	Y	Y
Sampling	SAM	Core sampling	N	N
Downhole	HF	Heatflow	Y	Y
Chemistry	IW	Interstitial water analyses	Y	Y
Chemistry	GECE	Gas chromatography	Y	Y
Chemistry	REVAL	Rock Eval (Kerogen)	Y	Y
Chemistry	CACO3	Calcium Carbonate	Y	Y

Table 3 - Logging Tools

Log / Acronym	Principle	Through Pipe	Synthetic / Seismogram	Lithology & Mineralogy	Porosity	Geochemistry # elements	Other
Sonic (LSS)	Travel time of sound	N	G	F	G	-	-
Resistivity							
Shallow(SFL)	Resistivity to current	N	F	F	V	-	-
Medium (ILM)	Induced current	N	F	F	V	-	-
Deep (ILD)	Induced current	N	F	F	V	-	-
Gamma Ray(GR)	Natural gamma emissions	N	P	V	-	-	-
Caliper (CALI)	Hole diameter	N	-	P	-	-	1
Dual Laterolog (DLL)	Resistivity to current	N	F	F	V	-	-
Neutron porosity (CNT-G)	Absorption of bombarding neutrons	Y	P	F	V	1	-
Spectral gamma (NGT)	Natural gamma-ray emissions	Y	P	V	-	3	-
Density (LDT)	Absorption of bombarding gamma rays	N	G	G	G	-	-
Gamma Spectroscopy (GST)	Capture of bombarding gamma rays	Y	F	V	F	6	-
Neutron porosity (ACT)	Absorption of bombarding neutrons	Y	P	F	V	2	-
12 Channel sonic (MCS)	Travel time of sound (12 receivers)	N	V	F	G	-	2
Televiewer (BHTV)	Travel time and reflectivity of borehole wall	N	P	F	-	-	3
3 Axis Magnetometer (GPIT)	Oriented magnetic field including inclination	N	P	F	-	-	4
Formation Microscanner (FMS)	Resisitivity to current	N	P	F	V	-	3

Notes: V = Very Good, G = Good, F = Fair, P = Poor

1) Quality control for other logs 2) Shear velocity, apparent attenuation 3) Stress directions, fracture orientation, structural dip, formation morphology 4) Magnetic reversals, stratigraphy, fault zones

APPENDIX D

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Curation and Repositories
January 1991 - June 1991

I. Repository Sampling Statistics

A. Average yearly sample distribution under DSDP vs. ODP

23,230/year under DSDP (1976-1984) versus 34,409/year taken under ODP (Jan 1985-June 1991; based on ODP total to date of 223,660). Average # samples taken per year under ODP is 49% greater than under DSDP (i.e. an average of 11,179 more samples are taken per year under ODP).

B. Total sample distribution (January 1991- June 1991) is 23,602. Breakdown of sample distribution by repository (East Coast Repository= ECR, Gulf Coast Repository= GCR and West Coast Repository= WCR) is as follows:

ECR = 9,785 (all subsequent)
GCR = 10,442 (5453 shorebased, 4989 subsequent)
WCR = 3,375 (all subsequent)

C. Total number visiting scientists at each repository (includes sampling, describing and photographing cores)

ECR = 46
GCR = 27
WCR = 21

D. Average request approval turnaround is:
1.5 weeks for subsequent
1.7 weeks for shorebased*

*shorebased requests are subject to Co-chief approval and therefore may take longer to approve.

E. Non-Visitor average sampling turnaround (based on date of receipt of approved request at repository)

ECR = 6 weeks
GCR = 2 weeks
WCR = 2 weeks

II. Shipboard Sampling Statistics

Total sample distribution (January 1991 - June 1991) is 28,278. Breakdown of sample distribution by leg is as follows:

Leg 135 = 6,408
Leg 136 = 750
Leg 137 = 82
Leg 138 = 21,138

III. The Curation Project and the Recuration Program

A. The Core Curation Project, initiated by DSDP in 1983 and continued by ODP until 1986, involved photography and, in some cases, rephotography of all archive halves of cores stored at the ECR and WCR for Legs 1-65. Cores in whole round were split and labeled (including many igneous/metamorphic, zero and miscellaneous sections). At the ECR, all archive halves were cleaned and occasionally reconstructed when time allowed. At the WCR, all archives were cleaned and reconstructed. Cores were intermittently rephotographed by ODP when necessary in order to complete this project. The end result of this work can be seen on the ODP video disc. A steady state was achieved in January 1989.

B. The Recuration Program was initiated by ODP in 1985 in an effort to combat the advanced state of deterioration of many cores due to expansion, desiccation, heavy sampling associated with lack of proper curatorial maintenance, and poor initial shipboard curation. If necessary, restoration of the core sections is performed by the permanent staff of each repository when a section is being sampled for a request. This process slows the sampling process tremendously. Sponges stored with the cores are always refreshed when a core is sampled. In order keep sample output high and also maintain the cores, a full fledged Recuration Program is proposed (Appendix A). At present the Program exists in the summer months only, when student labor is readily available. The following is the work that has been accomplished to date.

mmw = #man months of work
done = #man months completed
	ECR mmw	ECR done	GCR mmw	GCR done	WCR mmw	WCR done

1. rewet sponges*	0	12	3	3	4.0	1
2. recurate cores**	110	4	65	1.5	53	1
3. inventory thin sections/smear slides***	.5	-	-	-	4	1

* suggested sponge rewetting schedule is every two years
**(ECR/GCR=archive & work, WCR work only)
*** Not applicable to GCR which continues to receive thin sections and smear slides while ship is in the Pacific/Indian Oceans.

IV. Geriatric Core Study (GER)

In January 1988 IHP and PCOM endorsed a request to collect cores of convenience to monitor the changes (if any) which occur in cores while they are stored in the DSDP/ODP repositories. As of this writing, the following cores have been collected for use in the Geriatric Study. No additional cores intended for use in the Geriatric Study have added to the collection since the last report to the IHP.

A. Collected Cores

2 GER cores from Leg 119 (Kerguelen Plat.) are stored at ECR
3 GER cores from Leg 124E (Luzon Straits) are stored at GCR
1 GER core from Leg 132 (Shatsky Rise) is stored at GCR

B. Status of Geriatric Core Sampling

There has been no sampling since February 1991. However, new information that was not reported at the last meeting is included in the graph (January 1991 - present) and the chart in Appendix B.

V. Communication with the Scientific Community

All three repositories have readily accessible fax machines now. Scientists with requests for information or questions about sample requests are encouraged to communicate freely with the repositories and the Assistant Curator via fax or electronic mail. The possibility of implementing an electronic mail "forum" as suggested in the minutes from the March 1991 IHP Meeting, for the purpose of requesting samples is being explored. The fax numbers and email addresses are:

Assistant Curator fax = 409-845-4857, email address = CHRIS@NELSON.TAMU.EDU
ECR fax = 914-359-5262, email address = ECR@LAMONT.LDGO.COLUMBIA.EDU
WCR fax = 619-534-4555, email address = WCR@ODPWCR.UCSD.EDU
GCR fax = 409-845-4857, email address = GCR@NELSON.TAMU.EDU

VI. Computer Status

A. Communications

1. File transfers- Routine file transfers are being made between the repositories and the central office in Texas using FTP (file transfer program). In addition, file transfers can be accomplished using KERMIT via modem.

2. Computing environment, new computer installation and networks- Five program versions at the ECR and WCR are being updated. The updates will speed file transfers and allow the use of utility programs which have been, or will be installed on the remote systems. The utilities will be activated first at the WCR during an on-site visit by a representative of the Computer Services Group WCR, and then remotely at the ECR after WCR testing is complete.

B. Sample Investigations Database (SID)

1. Sample Requests (January-June 1991)

Requests processed = 271
Requests coded and entered = 3,333
Backlog of requests to code as of 30 June 1991 = 2,361

2. Bibliographic reprints are at a steady state. All published ODP Scientific results and part A papers have been entered.

Reprints entered = 2,319

C. DSDP Bibliographic Database (Curation assumed responsibility in May 1991)

As of 31 July 1991, updates have been made to records through Volume 90 of the Initial Reports of the Deep Sea Drilling Project.

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D. Sample Records Data

All ODP shipboard sample records are recorded in real-time and are available in a computerized database during the cruise. Several reports are made available to the scientists. DSDP sample records have been cleaned up and loaded into searchable datasets. They will be used to ease the task of residue inventory. The sample records datasets are used to determine the extent of sampling across specific intervals in a core. These records can be linked to SID which contains detailed information about the proposed studies, the investigator and the resulting papers.

Legs 100-138 shipboard sample records uploaded and on-line.
Legs 1-127 subsequent sample records are uploaded.

E. Thin Section Database (TSD)

The TSINFO (Thin Section Information) dataset and its user interface program were modified per specifications provided by ODP thin section technicians and repository staff. Changes should make it easier to inventory and track ODP thin sections.

Steady state achieved for ODP thin section data entry
Upload DSDP (Legs 64-96) thin sections inventory (mmw = 6)

F. Repository Sampling Database (REPSAM) - the backlog of sample request data entry from all repositories has been entered using REPSAM.

Sampling in the repositories is quite different than sampling in the shipboard environment and, as such, requires computer programs which address special data entry needs. With the completion of the beta version of REPSAM scientists now receive sample inventories with calculated sub-bottom depths and, when requested, electronic copies of sample data. These capabilities are currently limited to the GCR. The Computer Services Group is presently customizing SAMUTL, the VAX based package of utilities that allows uploading, searching, editing and report writing, for installation on the ECR and WCR microVAXes. The problem of electronically transferring "uploaded" sample data from the remote repository microVAXes to ODP/TAMU datasets has yet to be resolved.

G. Section Log Dataset

This dataset is designed to keep a record of the history of core sections which require curation or have experienced a noticeable change from the original state as recorded in barrel sheets or core photographs. In addition, it will contain information on critical or rare material in the cores. It is intended to supplement the core-specific information stored in the CORELOG database.

The SECTIONLOG dataset's user interface program required rewriting. The program is presently being tested and debugged.

Testing and debugging = 3 months of curatorial staff effort
Data entry of backlog = 12 mmw

VII. Curation and Repository Improvements

A. West Coast Repository

1. The move into the new facilities is nearing the half way point. All of the cores in the West Building have been transferred to the new refrigerated space. This leaves only a few miscellaneous items and a small residue collection remaining to complete the move from the refrigerated space. Major work remains in the final placement of the residue collection. The new lab space is presently awaiting the installation of floor tile, additional electrical work, a heat pump, and the final installation of the plumbing. The new lab can be used as a backup sampling area when space becomes tight.

2. The WCR is using the opportunity of the move to update its inventory of the IW and Core Catcher collections. It is also using the opportunity to reorganize the cores so the archive and working halves are stored in the same rack. This will improve sampling efficiency by making the working halves more accessible without the use of ladders and will make the re-curation program more accurate and efficient by having the working and archive sections in close proximity for quick comparisons.

3. The photographic color slide collection of all DSDP Pacific and Indian Ocean, and Red Sea cores rephotographed in the DSDP Curation Project has been received.

B. Gulf Coast Repository

1. The Curatorial Cookbook describing shipboard curatorial policies and procedures has been reorganized, re-compiled and updated by GCR staff. A draft version of the new Cookbook will be completed and available for use during Leg 140.

2. A draft version of a user's guide for SAMUTL was written by the GCR staff and forwarded to the CSG. The CSG will write 2 additional chapters for the user's guide.

3. Legs 133, 134 and 135 cores (~14,000 sections) have been unboxed and are racked in the refrigerators.

4. The photographic color slide collection of all ODP cores collected from the Pacific and Indian Ocean has been cataloged.

5. Refrigerator expansion - The TAMU Physical Plant has provided a cost estimate for expanding the Rm 118 core refrigerator. They are currently working on a design specification. The estimated construction will be mid-November. The project should be completed in January 1992. When completed, space will be available for all cores collected up to and including Leg 147, after which the ship is scheduled to return to the Atlantic Ocean.

C. East Coast Repository

1. The second summer recuration is presently underway. Legs 1-11 (archive and working) have been recurated. Summer of 1991 average rate of recuration is 608 sections/month.

2. All returned residues have been cataloged to date.

000250

3. The photographic color slide collection of all ECR housed cores rephotographed in the DSDP Curation Project and all ODP cores collected in the Atlantic, Mediterranean, Caribbean, Gulf of Mexico and Southern Ocean has been cataloged.

4. The freezer box core catcher collection has been inventoried, and "miscellaneous" material mistakenly stored in that collection has been weeded out.

5. A fax and desk top copier were purchased in an effort to improve communications with ODP/TAMU and the scientific community.

6. Plans to expand refrigerators to receive Atlantic cores in January 1993 are underway.

Appendix A
000251

Budget for DSDP-Only Recuration Program

Action Item #3 of the March 1991 IHP Meeting asked for a "revised cost of core curation and reconstruction at the time cores are opened for sampling (limit to DSDP) cores." The following estimates are based on this request but also include costs to recurate all badly deteriorating DSDP cores at the ECR and WCR on a time available basis. That is, after the "recurator" has completed the task of recurating all cores scheduled to be sampled (both by repository staff and visitors) for a given period of time, that person will be assigned to recurate cores chronologically by leg, starting with the earliest DSDP legs. This is, in effect, what was done at the ECR during the summer months of 1990 and 1991 and at the GCR during the summer of 1990. This system worked well and should prove to be an efficient way to tackle this problem if resources are made available on a yearly basis using "left-over" DSDP funds.

ECR core recuration costs	costs/yr	Total costs	
77 man months of work = 6.5 man years (72,640 sections)			
1. one full-time position (includes fringe costs)	$25,000	$186,799	*
2. supplies	5,000	37,360	**
WCR core recuration costs 54 man months of work = 4.5 man years (40,000 working sections only***)			
1. two 1/2 time undergrad students(includes fringe costs)	$23,000	$113,111	
2. supplies	5,000	24,589	
TOTAL PER YEAR	$58,000		
TOTAL FOR PROJECT		$361,859	

* Total cost for salaries includes a yearly 5% cost of living increase.

** Total cost for supplies includes a yearly 5% inflation increase.

***The WCR curated archive halves during the Curation Project (1983-1986). However, when recurating the working halves in the future, the corresponding archive half will have to be pulled so that comparisons can be made. In some cases, the archive half will also have to be recurated.

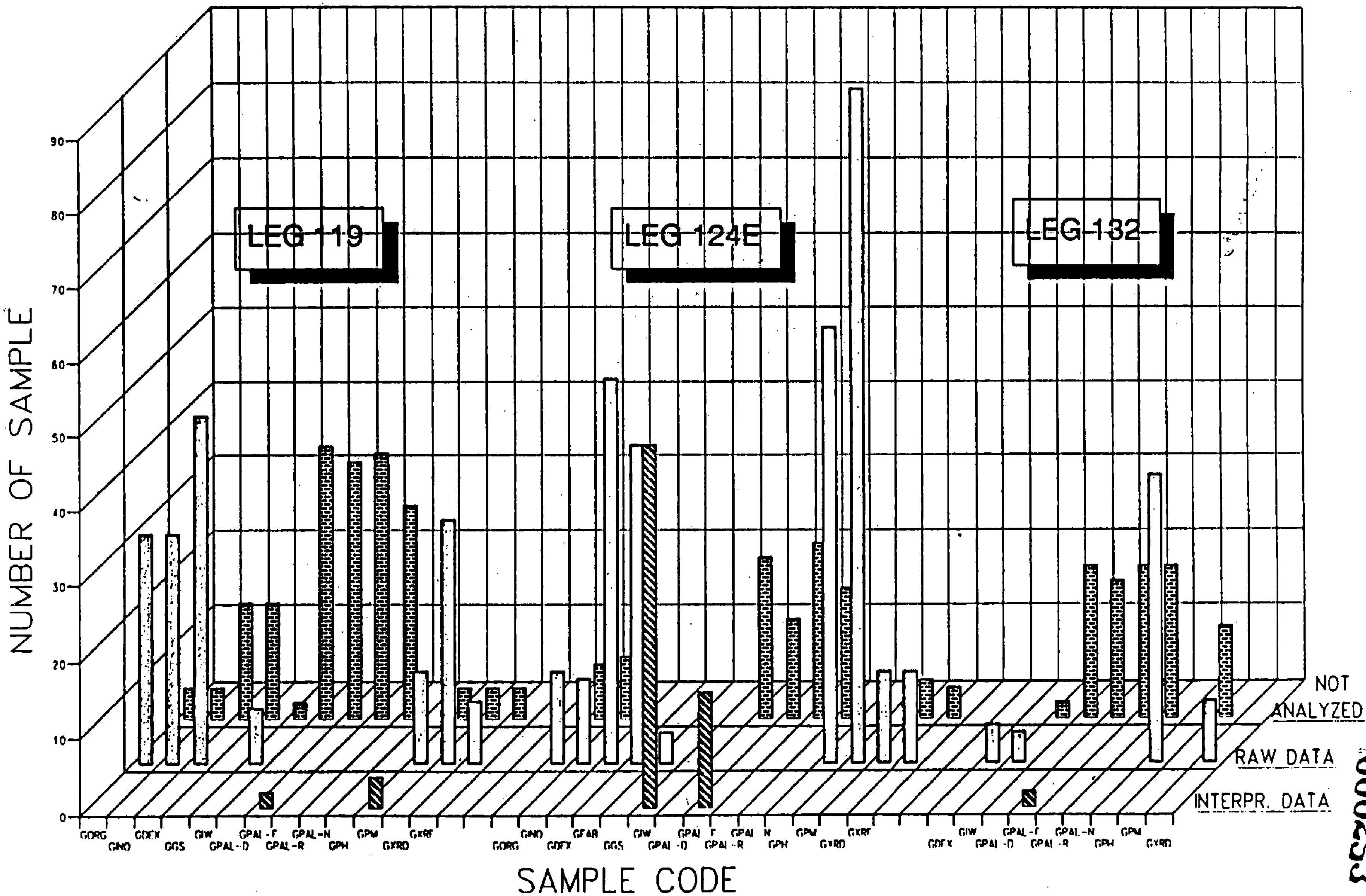
000252

Geriatric Study
January 1991-June 1991

LEG	SAMPLE CODE	NOT ANALYZED	RAW DATA	INTERPRETED DATA
119	GINO	4	30	-
	GDEX	-	15	46
	GIW	-	2	7
124E	GORG	-	7	12
	GINO	-	8	11
	GFAB	-	42	-
	GGS	-	4	-
	GPH	-	58	-
132	GIW	2	4	-

NOTE: 137 samples were inadvertently left out of the last report's statistics.

Geriatric Study: Bar graph of sampling statistics, analysis and interpretation of data as of July 1991.



000253

000254

APPENDIX E

000255

Borehole Group Computer Report to Information Handling Panel
September 11-13, 1991

This report is divided into three sections:

1. Shipboard Computer update
2. LDGO-BRG Computer update
3. Software update

1. Shipboard Computer Update

The shipboard Masscomp and Macintosh computers have been updated since our last report to the Information Handling Panel. We now have a Masscomp 5600 with 8 Mb of RAM, a 474 Mb hard disk, and a color X-windows graphics terminal that replaces the original Masscomp 5500. The Macintosh SE has been replaced with a Macintosh IIci with a color screen and a Syquest cartridge disk drive.

2. LDGO-BRG Computer Update

Masscomp

The laboratory Masscomp computers have also been upgraded from Masscomp 5500 to Masscomp 5600 systems in parallel with the upgrade of the shipboard system. We are in the final stages of configuring the data acquisition 5600 so that it is identical to the one on the ship. This lets us develop and test software in the lab and also train users before they go to sea. We have encountered some minor problems while we have been in the transition from the older systems with Masscomp graphics windowing to the newer systems that are X-windows based.

A single Masscomp 5500 has been kept on the BRG network to provide continuity for the older software packages as we develop replacements for them.

We have received version 5.2 of TerraScience's Terrastation software (successor to Terralog). This supports X-windows graphics in addition to older formats such as Tektronix graphics terminals. We are debugging and testing the software and will be installing it on the ship as soon as possible.

The laboratory Masscomp computers are basically our "research" systems used by the students and scientists for modeling and exploratory data analysis.

PDP-11 Energy Systems Workstation

The use of this system is down considerably and it is likely that we will retire it in the upcoming year. It is being supplanted by the Schlumberger software on the VAXCluster, Terralog on the Masscomps, and the Macintosh, all in combination.

We had been told by Energy Systems that the cost of an educational upgrade to a VAX-based version would be free. As a result we solicted and received the donation of a MicroVAX II which was intended to act as the host for this software. We have now been told that the cost of the educational upgrade is $20,000. We are continuing to discuss this with Energy Systems, Inc., and are evaluating our other options.

VAXCluster

There have been no substantial changes in the BRG VAXCluster running the Schlumberger Elite 1000 software package. As mentioned above, we have received a donated MicroVAX II which we will configure and add to the cluster this fall. This will give us added flexibility and provide a system on which to run non-Schlumberger software. This will include the Digital Borehole Televiewer software, among other packages.

We are planning a major upgrade to the BRG VAXCluster for this fall. We would replace the existing MicroVAX II with a MicroVAX 4000 and add two additional VAXstation 3100 systems. An additional 4 Gb of disk storage would be added, along with another graphics plotter and a DAT tape drive.

The VAXCluster constitutes our main "production" environment for log data processing and data distribution.

Other Computers

Our plans for this fall are to add several additional Macintoshes for several purposes: 1) general user use in word-processing, plotting, and as terminals, 2) preparation of figures for publication in the Initial Reports, and 3) use by scientific visitors for post-cruise data analysis.

We will also be adding an MS-DOS machine which will also have multiple uses: 1) training in the use of the Digital Borehole Televiewer acquisition software, 2) access to the DSDP CD-ROM database, 3) MS-DOS format data exchange, and 4) graphics terminal access to our other computers.

3. Software Update

X-windows

We have placed X-windows software on all of our Masscomp computers in the lab and on the ship. We are in the process of converting our existing Masscomp windowing system programs to X-windows versions as time allows. This process will accelerate in the next fiscal year after the addition of our programmer/assistant systems manager.

Terralog

As mentioned above, we have received the latest version of the TerraSciences Terrastation software. This software is being debugged and tested at this time. A not fully functional version is being put on the shipboard system during the Victoria port call. As the system is debugged, the appropriate patches will be applied to the shipboard system.

Borehole Televiewer

The Digital Borehole Televiewer system is supported by an MS-DOS based data acquisition computer and an analysis package on the VAX. This has been installed in the lab and on the ship. A log analyst and the system manager will be becoming familiar with the use of the analysis package in the upcoming year. The VAX based analysis software appears to be quite versatile and well thought out in both user interface and programming features.

Formation MicroScanner

In addition to the menu programs that we received from Schlumberger's New Orleans computer processing center last April, we have also received a set of programs from the Houston computer center in November. All of these programs make menus for FMS processing. This new set of programs should be evaluated to determine which of them we will adapt for our internal use. The menus make it much easier to train people to do FMS processing, as well as speed up the processing. The Schlumberger baseline of programs was updated from version 18.1 to 18.2 in November at BRG and in December on the ship. Dipmeter processing programs have been experimented with recently and are in the process of being documented in the in-house FMS manual written by Robin Reynolds for training purposes.

000258

Borehole Group Database Report to Information Handling Panel
September 11-13, 1991

The present report is divided into two sections:
1. Database report
2. Data processing and publication update
3. Survey results

1. Database Report

Database Update

The ODP database currently includes logging data tapes through Leg 138 and consists of over 1100 magnetic tapes, including Schlumberger original proprietary and field edit tapes, backup tapes of processed data, temperature data tapes, and multichannel sonic tapes. Videotapes of borehole televiewer data recorded at selected sites are available as well. Starting with Leg 126 the ODP database also includes Formation MicroScanner (FMS) data, in the form of original proprietary tapes and processed backup tapes. Blackline copies of the processed FMS images are now available to interested scientists for Legs 126, 127, 128, 129, 130, 133, and part of 135 (Holes 834B and 835B). Microfiche of FMS images are available for Legs 126 to 133.

Data Requests

After a slow start in the first trimester of 1991 the number of well log data requests has substantially increased in the second trimester (Figure 1); many FMS data requests from Legs 134 and 135 are now being processed. Figure 1 also shows the request distribution by country (the complete list is contained in Appendix 1).

Data Requests and Communications via Electronic Mail

The Borehole Research Group at Lamont-Doherty can receive data requests and queries electronically by two paths. The first path is through our mailbox on Omnet. The address of this mailbox is simply 'borehole'. It is checked every day. The second path is over the InterNet. Lamont-Doherty has a T1 class connection to the InterNet so data file transfer over the net is a practical option in addition to handling electronic mail. Data transfer via ftp or anonymous ftp can be arranged (this has already been done in several instances). The primary contact points for outsiders are the following:

1. `borehole@lamont.ldgo.columbia.edu` (general purpose account)

2. `hobart@lamont.ldgo.columbia.edu` (account for the LDGO-BRG computer systems manager, for computer related questions)

3. `chris@lamont.ldgo.columbia.edu` (account for Cristina Broglia, database manager, for database and log analysis-related questions)

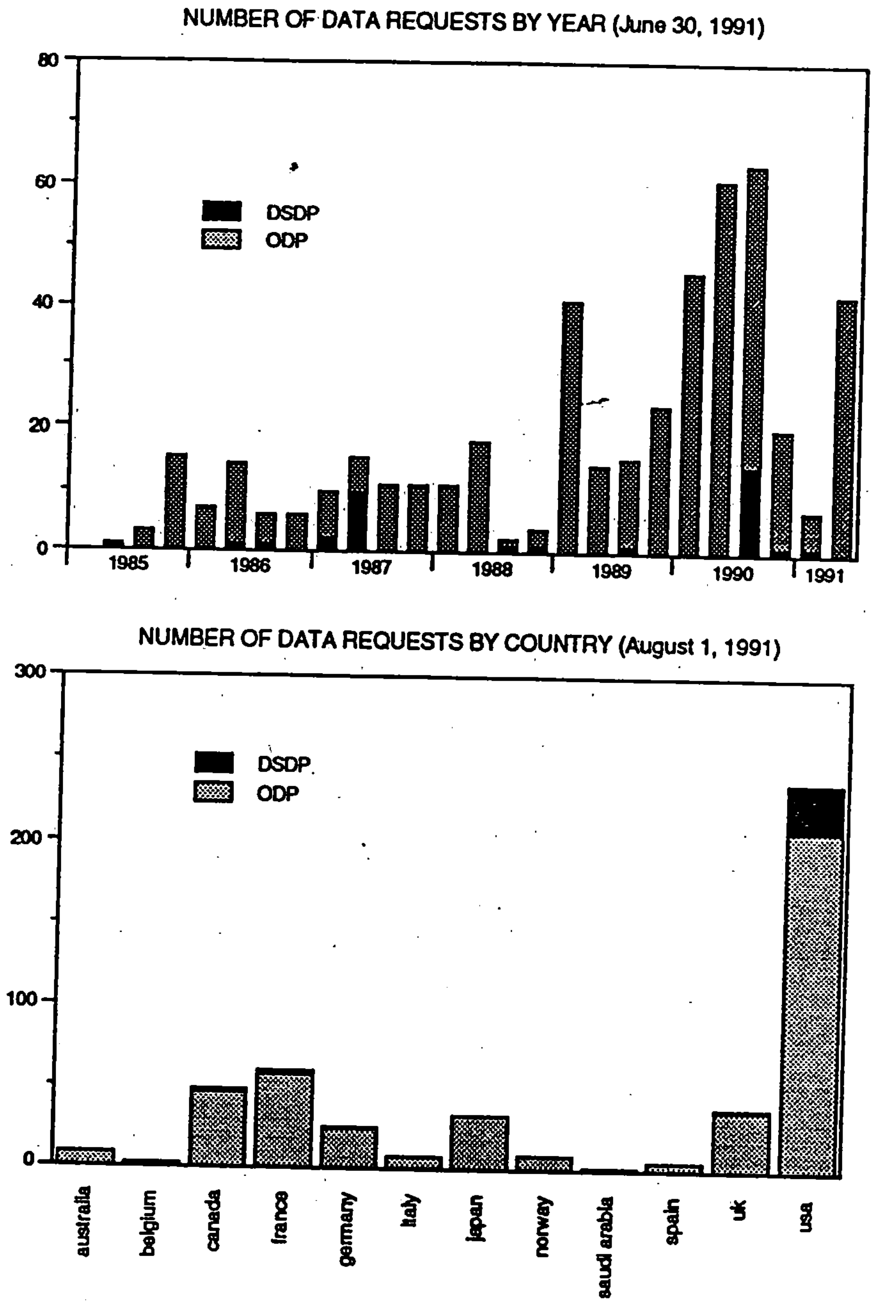

NUMBER OF DATA REQUESTS BY YEAR (June 30, 1991)
80
60
40
20
0
DSDP
ODP
1985
1986
1987
1988
1989
1990
1991
NUMBER OF DATA REQUESTS BY COUNTRY (August 1, 1991)
300
200
100
0
DSDP
ODP
australia
belgium
canada
france
germany
italy
japan
norway
saudi arabia
spain
uk
usa

Figure 1

000260

Data Media

The primary medium for data exchange is 1600 bpi 9 track tape. Upon request we can also provide 800 bpi tapes of standard Schlumberger data. Data may also be distributed on Macintosh format 3.5" diskettes and MS-DOS 3.5" diskettes.

NGDC-UK Database

Well log data of Legs 130 and 131 were shipped in July to NGDC and to the UK database located at Leicester University. Next shipment, including Legs 133 and 134 data, will take place by the end of December.

Distribution of Logging Data

Plots of the standard logging data (partially processed and now depth-shifted with reference to the sea floor to facilitate correlation with cores) are routinely distributed to each member of the shipboard party 3-4 months after the end of the leg, along with forms to request additional data. Distribution of standard log data from Leg 136 was completed recently; distribution of Leg 138 data should take place by mid-october.

2. Data Processing Update

Geochemical Data Processing

Geochemical data generally are processed in time to be presented to the shipboard party at the second post-cruise meeting. Leg 134 geochemical data are currently being processed. Leg 121 through 129 results have been submitted in a data report for the ODP Scientific Results volumes. Data reports for Leg 121 through 126 have been accepted for publication.

Formation MicroScanner Data Processing

Routine FMS and dipmeter processing steps have been defined for shipboard processors in an FMS manual. Shorebased processing consists of depthshifting FMS images and dipmeter data to match a standard reference log chosen by the log analysis staff at BRG. After shifting, new plots are made on a Benson plotter, which produces higher quality plots than the Versatec plotter on the ship.

ODP TAMU employees Matt Mefferd, Dan Bontempo, and Don Sims, sailed on Leg 136, Leg 138, and Leg 139 respectively with the half-time position as an FMS processor/Asst. Systems Manager for the VAXstation 3200. Wendy Autio, ODP TAMU, was trained in FMS processing techniques in April 1991 and Don Sims was trained in June 1991. There are now 4 ODP TAMU employees who can do FMS processing and the hope is that there will always be someone available to sail as an FMS processor on every leg where FMS data is expected to be collected.

Publications in the ODP Proceedings

A summary of depth-shifted and edited well log data is routinely submitted for publication before the barrel sheets in the Initial Reports of the ODP Proceedings. In general, this summary is ready 2-3 weeks after the first post-cruise meeting or, if problems arise, by the second post-cruise meeting.

Starting with Leg 121, we have submitted for publication in the Scientific Results volumes a data paper which includes the results of the geochemical processing performed onshore (see above, Geochemical Data Processing).

FMS images on microfiche have been inserted into a pocket inside the back cover of the Initial Report volumes. Each microfiche page contains 98 frames, with each frame displaying approximately one meter of processed images.

3. Survey Results

Last spring a survey was undertaken by the Borehole Research Group to determine the usefulness of logs in solving geological problems and the performance of BRG as a database and log analysis center. The results, which are presented in full in Appendix 2, can be summarized as follows:

The high response rate (62.3%) of those scientists contacted confirms the increasing interest of the scientific community in well logs. Even though most of the responses come from people with a geophysical background (who therefore already might have been acquainted with logs), it is interesting to note that many come from people who traditionally do not use logs, such as sedimentologists, geochemists, and stratigraphers. Requestors included not only logging scientists directly involved in the data acquisition but also other members of the shipboard party, who became interested on board as logs and cores were correlated (particularly FMS images), in logging schools, or at scientific meetings.

While most of the scientists already use some log analysis software they all would welcome a basic log analysis package performing functions such as depth shifting, environmental corrections, interactive graphics, etc. Some would like more sophisticated functions to be implemented as well, such as image processing, advanced statistical analysis, and analysis of sonic waveforms.

According to the responses and the enclosed list of publications (both within and outside ODP; see Appendix 2) logs have proven to be useful in addressing a wide range of geological problems.

Most of the problems encountered which limited the use of the logs were related to the acquisition process (e.g. low quality data due to bad hole conditions, presence of pipe or casing, tool malfunction etc.) or to the tool resolution.

In order to use logs better many scientists asked for a longer and more thorough pre-cruise training program (possibly sponsored by ODP/USSAC). This might be achieved more easily with a tutorial to be set up at BRG. Some also requested real-time training of shipboard scientists to the value of logging, through the use of shipboard workstations.

As to the data distribution, most scientists considered the service received from the BRG very good, but suggest possibly transferring the data electronically. This would certainly streamline the workload of the BRG database personnel. Putting the entire database online is currently under the consideration of some members of the group who will keep IHP informed of future developments.

In conclusion, the results of this survey helped us not only to take a stock of our activity but also, most important of all, to identify areas that need improvement. All the useful suggestions received indicate to us tour future direction for providing the community with a more and more efficient logging service.

Appendix 3 is a list of all the log-related publications submitted by the scientists who answered the survey.

APPENDIX 1

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Total requests on 8/1/91: 469 (433 ODP, 36 DSDP)

Total USA requests: 236 (207 ODP, 29 DSDP)
Total foreign country requests: 233 (226 ODP, 7 DSDP)

U.S. Institutions:	**No. of requests:**		
	Total	ODP	DSDP
USA:	236	207	29
Brown University	1	1	
Colgate University	1	1	
California Inst. of Technology	1	1	
Dept. of Earth and Atmospheric Science	1	1	
Exxon Production Research Company	3	3	
Florida State Univ., Dept. of Geology	2	2	
LDGO	12	9	3
Los Alamos National Labs	1	1	
MIT	23	20	3
Nat. Sci. Found., Marine Geol. & Geophysics	7	7	
ODP	18	18	
Oregon State Univ., College of Ocean.	1	1	
Purdue Univ., Dept. Earth & Atm. Science	4	4	
Schlumberger	2	2	
Scripps Inst. of Oceanography	1	1	
Stanford Univ., Dept. of Geophysics	25	15	10
Stennis Space Center	6	6	
Texas A & M, College of Geoscience	8	7	1
Texas A & M, Dept. of Oceanography	2	2	
Univ. California at Santa Barbara	1	1	
Univ. of California at Santa Cruz	7	7	
Univ. Hawaii at Manoa, Inst. of Geoph.	19	19	
Univ. Hawaii, Dept. of Oceanography	11	3	8
Univ. of Miami	3	2	1
Univ. of Michigan, Dept. of Geology	3	3	
Univ. Nebraska at Lincoln, Dept. Geology	6	6	
Univ. New Orleans, Dept. Geol. & Geoph.	9	9	
Univ. Rhode Island, Grad. School Ocean.	11	11	
Univ. So. Carolina, Dept. Geo. Sciences	1	1	
Univ. of Texas, Inst. for Geophysics	8	8	
Univ. of Tulsa, Dept. of Geology	2	2	
Univ. of Washington, Ocean & Fishery Sc.	1	1	
Univ. of Washington, School of Oceanogr.	4	4	
USGS	18	16	1
WHOI	13	12	1

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Foreign Institutions

No. of requests:

Total: 233 (226 ODP, 7 DSDP)

	Total	ODP	DSDP
Australia:	9	9	
Bureau of Min. Res., Geol. and Geophys.	9	9	
Belgium:	1	1	
Lab. Associes Geol.-Petrologie-Geochron.	1	1	
Canada:	47	45	2
Dalhousie Univ., Centre for Marine Geol.	19	18	1
Geol. Survey of Canada	1	1	
Memorial Univ. of Newfoundland	2	2	
Petro Canada	1		1
Thurber Consultants Ltd.	1	1	
Univ. of Calgary, Dept. of Geology	1	1	
Univ. of Toronto	8	8	
Univ. of Waterloo, Dept. Earth Science	14	14	
France:	59	56	3
BRGM	2	2	
Ifremer	1	1	
Ins. Physique du Globe. Lab. Geop. Mar.	9	9	
Lab. Geomagn. Un. Paris 6	1	1	
Lab. de Stratigraphie	1	1	
Mus. Nat. Hist. Naturelle	5	5	
Total	2	2	
Univ. Nancy 1, Fac. of Science	10	10	
Universite d'Orleans	6	6	
Universite Pierre et Marie Curie	3	3	
Inst. Mediterraneen de Technologies	14	10	3

	Total	ODP	DSDP
Germany:	25	24	1
Bundesanstalt Geowissenschaften und Rohstoffe	7	7	
DMT	2	2	
Geologiskes Institut-U Univ. Kiel	1	1	
Geomar	3	3	
Geophysikalisches Institut	2	1	1
Inst. Allgemeine und Angewandte Geoph.	1	1	
Institut F. Mineralogie	7	7	
Wegener Inst. for Polar and Marine Res.	1	1	
Inst. of Petrol. and Org. Geochem.	1	1	
Italy:	8	8	
Ist. Geol. Mar. CNR	6	6	
Univ. Calabria, Dip. Scienze della Terra	2	2	
Japan:	32	32	
Chiba Univ. Dept. Earth Science	7	7	
Tohoku Univ. Geol. Dept.	2	2	
Univ. of Tokyo, Earthquake Res. Inst.	2	2	
Univ. of Tokyo, Geology Institute	10	10	
Univ. of Tokyo, Geophysics Inst.	5	5	
Univ. of Tokyo, Ocean Res. Inst	6	6	
Norway:	9	9	
Univ. of Trondheim, Inst. of App. Geophy	9	9	
Saudi Arabia	1	1	
King Saud University	1	1	
Spain:	5	5	
Hispanoil-Eniepsa	5	5	

	Total	ODP	DSDP
UK:	37	36	1
BP Research Center	1	1	
BRITOIL PLC	2	2	
Open Univ., Dept. of Earth Science	10	10	

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	Total	ODP	DSDP
Reg.Geophys.Res.Grp., Brit. Geol. Survey	2	2	
Univ. of Durham	1	1	
Univ. of Leicester, Dept. of Geology	8	7	1
Univ. of Nottingham, Dept. of Geology	9	9	
Univ. of Southampton	4	4	

000267

SURVEY OF LDGO-BOREHOLE RESEARCH GROUP: LOGGING PERFORMANCE AND USERS' NEEDS

CONTACTED: 78
RESPONDED: 48 (62.3%)

USERS' BACKGROUNDS

Institutions

NORTH AMERICA

Brown University, Providence, RI	
Chevron Oil Field Research, La Habra, CA	
Dalhousie University, Halifax, Canada	2
Geoph. Exploration and Dev. Corp., Calgary, Can.	
Univ. of Hawaii, Honolulu, HI	3
LDGO, Palisades, NY	2
Massachusetts Inst. of Tech., Cambridge, MA	2
Memorial Univ., St. John's, Canada	
University of Miami, Miami, FL	
University of Nebraska, Lincoln, NB	2
Purdue University, W. Lafayette, IN	
Univ. of Rhode Island, Narragansett, RI	
James Scott & Assc, Denver, CO	
Univ. of S. Carolina, Columbia, SC	
Stanford University, Stanford, CA	
Texas A&M Univ., College Station, TX	3
Univ. of Waterloo, Waterloo, Canada	
USGS	3
Deer Creek Campus, Palo Alto, CA	
Denver Campus, Denver, CO	
Quissett Campus, Woods Hole, MA	
WHOI, Woods Hole, MA	3

EUROPE and ASIA

British Geological Survey, Nottingham, UK	
British Petroleum Exploration, Aberdeen, Scotland	
Bund. fur Geowissen. und Rohstoffe, Hannover, Germany	
Chiba Univ., Chiba, Japan	
Ecole et Observ. de Physique du Globe, Strasbourg, France	
Geomar, Kiel, Germany	
Geophysikalisches Inst., Karlsruhe, Germany	
Inst. Mediterraneen de Tech., Marseille, France	
Inst. of Ocean. Sciences, Wormley, UK	
Inst. Petrol. Engin. and App. Geoph., Trondheim, Norway	
Univ. of Durham, Durham, UK	
Univ. of Leicester, Leicester, UK	
Univ. of Southampton, Southampton, UK	
Univ. of Tokyo, Tokyo, Japan	4

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User's main field of interest

Biostratigraphy	1
Borehole Geophysics	2
Downhole Measurements	1
Geochemistry	6
Geophysics	**22**
Heat Flow	2
Hydrogeology	1
Marine Geology	2
Paleoceanography	1
Paleomagnetics	1
Paleontology	1
Petrophysics	2
Physical Properties	5
Sedimentology	16
Seismology	4
Stratigraphy	4
Structural Geology	4
Tectonophysics	1

Participation in ODP leg: 42

Co-Chief Scientist	5
Geochemist	1
Geophysicist	1
Logging Scientist	**16**
Paleomagnetist	1
Paelontologist	1
Petrologist	2
Phys. Props. specialist	9
Sedimentologist	7
Technician	1

Previous logging experience: 15

British Geol. Survey	1
Industry	**7**
Research	5
USGS	2

Became interested in logging through:

AGU meeting
Core/log comparison
Correlation of logging and seismic
On the drilling ship
Sedimentary features/FMS images comparison
Logging classes
Logging literature

DATA PROCESSING CAPABILITIES

EQUIPMENT

Hardware

ALLIANT	1
COMPAQ 386/25	2
CONVEX	2
HP 3000	2
IBM/IBM comp./PC	9
MACINTOSH	5
MASSCOMP	2
SUN	3
VAX/MICROVAX	**15**

Software

Disco	2
ES-LOG	12
GGC	1
IBM graphics/spreadsheets	2
In House	**13**
Logprint	1
Mac graphics/spreadsheets	11
Mag Log	1
Schlumberger QLA	2
Terralog	6
Viewlog	1
Vista Seismic	1
Well Log	1

If a simple log analysis package were made available generally to ODP scientists, they would like to see these machines supported:

HP	1
IBM/PC	15
MACINTOSH	**21**
UNIX/SUN	14
VAX	8

these analysis functions performed:

Basic log analysis	8
Crossplotting	8
Depth shifting	5
Digitize BHTV logs w/ graphical analyses	2
Environmental corrections	2
FMS analysis	2
Integration of log/core data	1
Interactive graphics	7
Statistical analysis	7
Synthetic seis./SWF anal:	**10**

and these media used for data transfer:

CD ROM	2
3.5" floppy	**36**
5.25" floppy	25
8" floppy	1
9-track 1600 bpi tape	24
44 Meg cartridge	2
150 Mb cassette	1
Optical disk	1
WORM disk	1

Scientists who have used LDGO/BRG-processed data: 32

Scientists who have come to LDGO/BRG to process data: 10

Other companies/institutions contacted to process the data:

MIT Earth Resources Lab	1
Schlumberger	**4**
University of Leicester (UK)	1
University of Texas	1
WHOI	1

USEFULNESS OF LOGS IN SOLVING GEOLOGICAL PROBLEMS

Geological problems addressed (leg #):

GEOCHEMISTRY/PETROLOGY
Alteration and mineral composition of basalts (102, 120)
Mineralogy and paleomagnetism of hard rocks (102)
Petrogenetic evolution of basement (125)

GEOPHYSICS
Crustal structure and deformation (128)
Ground truth seismic stratigraphy, correlation between holes, and interpretation of non-recovered intervals (122)
Heat flow (102)
Mid-Ocean ridge accretion and hydrothermalism (111, 126)
Stress in oceanic crust (102, 109, 111, 123)
Seismic to core correlation -- use of property data collected in logs and lab meas.(130)
Synthetic seismogram generation, nature of reflectors (125, 127)
Thermal structure of back-arc basin (127)
Velocity/structure/stress in the oceanic crust (102, 109, 111)

HYDROLOGY:
Porosity and permeability of oceanic crust (102)

PHYSICAL PROPERTIES
Causes of "anomalous" phys. props.(102, 126)
Density and porosity of the oceanic crust (102, 109, 111)
Diagenesis and velocity to porosity relationships (122)
Physical property relationships (127)

SEDIMENTOLOGY/STRATIGRAPHY
Bedding and silicification (129)
Sedimentation rate discrepancies
Clay mineralogy (123)
Correlation of subbottom depth of core events to log events (121)
Cyclicity in the sediment record and controls of sedimentary cycles (105, 123)
Diagenesis of sediments (120)
Distribution of authigenic carbonates and sedimentary environments (128)
Downhole chemical composition of sediments and bulk composition of hole (105,123 125, 128)
Milankovitch cycles (129)
Opal A/Opal CT boundary discrimination (127)
Sedimentary features and lithology (129)
Site stratigraphy (129, 125)
Vertical evolution and frequency of turbidite sequences (123, 126)

Usefulness of logs:

VERY HELPFUL:	29
HELPFUL:	14
THERE WERE PROBLEMS	4

Problems encountered:

Data Acquisition

The proprietary logging tapes were lost and not backed up *(Note: the tapes were lost either on the ship or during the transportation to LDGO by a non-Lamont logging scientist)* so post-cruise processing was not possible

The poor weather conditions resulted in depth control problems and high noise levels, as the heave compensator was not working properly

The interval of interest presented a gap in the logging record

The log resolution was lower than that required for the study

The geochemical logs were recorded through pipe and the response was not quantitatively reliable

Tool malfunctioned during recording

The data quality was affected by the bad hole conditions

Data Processing

Problems encountered with BRG's ability to read SWF tapes *(Note: the program has been modified to read these tapes)*

Depth shifting is a fiasco; lack of documentation or quality assurance *(Note: documentation about depth shifing exists and is provided only upon the specific request of the interested scientist to avoid overburden of technical information)*

Processing is undocumented: track names and units are often mixed *(Note: documentation is available and specific information about processing steps can be obtained upon request)*

Overestimated the amount of processing that would be performed

Vertical resolution of logs not mentioned *(Note: vertical resolutions are listed in the ODP logging manual)*

Information provided about format of the data did not match the actual format

Poor calibration/processing, but this is not just an ODP problem

Planning to use logs in the future for other geological interpretations:

YES: 44 For ODP science only: 7 NO: 3

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PERFORMANCE OF LDGO-BRG AS DATABASE AND LOG ANALYSIS CENTER

Type of data requested: ANALOG: 12 RAW DATA: 20
DIGITAL: 27 PROCESSED: 26

Prompt arrival of data: YES: 38 NO: 2 (delayed for processing)

Assistance requested from BRG; YES: 29 NO: 13
BRG personnel helpful and knowledgable: YES: 12 NO: 1

Visited BRG log analysis facility for a training/processing session:
YES: 12 NO: 28 NA: 6
Plan to come to LDGO: 2

Service received from LDGO-BRG considered:
VERY GOOD: 22 FAIR: 4
GOOD: 9 POOR: 1

Services scientists would like to receive or to see improved:

Training:
-mandatory training on system and well-logging for all ODP-JOIDES logging scientists, which should be funded by ODP/USSAC (several requests)
-PCOM-sponsored field trial of the geochemical tool
-need to train shipboard scientists in real time to the value of logging. This should be a fundamental responsiblity of logging scientists (several requests)
-tutorial should be set up to be used for training
-need formal training space: lab and computers are too limited for effective use

Shipboard Operations:
-specialty tools should be modified for Schlumberger torpedo plug
-standardize workstation at sea

Data Processing and Distribution:
-transfer data over ethernet, internet, e-mail, or telenet bulletin board (several requests)
-improve handling, manipulation, and archiving of data rather than improve technology
-make more readily available logs in ASCII format on PC diskettes
-provide data in a format suitable for several common logging software packages
-free software for processing log data
-covenient if WST could be reprocessed into SEGY
-process BHTV at sea
-shipboard processing of geochemical and FMS data
-provide semi-raw FMS images at sea
-should have color FMS image facility for selected intervals
-quality control is a major concern for scientists.

General remarks:

Many scientists stated that they were impressed with the efficiency, willingness to help, and expertise of BRG. A few pointed out particular instances when they needed special help to use the data and were pleased when the group was more than willing to accomodate them, despite being understaffed. Others were surprised at the easy availability of desk space and workstations for visitors. Still another cited an instance when he had considered writing a paper on geochemical interpretations, but, after reviewing the reports being produced by the BRG personnel, decided to choose another area, as he felt he could not improve on the work.

APPENDIX 3

OCEAN DRILLING PROGRAM

LAMONT-DOHERTY BOREHOLE RESEARCH GROUP

LOG PUBLICATION LIBRARY

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APPENDIX F

000285

Report to IHP by the Indexing subcommittee (I.Gibson, W.Riedel, N.Rock, J.Saunders, H.Spall) on an improved index for the ODP Proceeding Volumes

General Considerations

We consider the index to be a form of reference database, with its own intrinsic value. It is much more than a sorted ASCII list of terms, and commensurate time and effort should be expended in its preparation. The printed version is a secondary and derivative form of the machine-readable database.

The index should be prepared with a view to its being used by the average literate scientist. Individual volume and cumulative indexes should be published in both printed and machine-readable forms.

The index should continue to be prepared initially as a combined index to Parts A and B which should continue to be considered and paginated as separate parts.

We recommend that a cumulative index to the ODP volumes 'to date' be prepared as soon as possible, following the new guidelines outlined below. We recognize that this will involve significant work (expense) in re-structuring (but not re-indexing) volumes that have been indexed already.

The structure of the Index

We recommend that the Site index be abandoned (see below) and that the expanded Table of Contents to Part A continue as the primary guide to each site.

We recommend that the Taxonomic index contain only taxonomic entries and that these first level entries be fully inverted (species, genus and genus, species). All other non-taxonomic entries should appear in the Subject index. This will include suprageneric names (these are not italicized). Zones are to be included in both the taxonomic and subject indexes, alphabetically by fossil name or by letter/number designation.

We recommend that the printed index be simplified to a two-level structure. Wherever possible, the present geographic second-level terms should be abandoned. Wherever possible, entries should also appear in a normal and inverted form. This simplification, and the elimination of the Site index and duplication, should result in a substantial reduction in the size of the index.

Notwithstanding the reduction to two levels in the PRINTED form, we recommend that a third, Site, level be retained for the MACHINE-READABLE index; that is, each entry should be attached to a specific Site.

Density of Indexing and use of the AGI Thesaurus

We recommend that the present density of indexing be maintained or increased to approximately six entries per page. Every effort should be made to ensure that at a minimum there is at least one index entry 'pointing' to every substantive heading in the text. Authors should be instructed to mark up their proofs for terms and phrases that should appear in the index.

We recommend that the terms used in the index be drawn if possible from the AGI thesaurus (AGI levels one to three all to be permitted at ODP levels one and two). The objective here is to improve the consistency of the index. Every effort should be made to find an AGI term BEFORE resorting to the inclusion of non-AGI entries. Non-AGI terms might form less than 5% of all first-level entries. In addition, the AGI Glossary should be used to help generate a standard set of cross-referenced 'XXXX, see under YYYY' entries that might appear in every Leg index. The absence of a term in the AGI thesaurus may indicate that its inclusion in the index is not appropriate.

Entries to sites NOT drilled on that particular Leg should appear under 'S' in the subject index. Entries to sites integral to the Leg in Part A should appear as 'Site YYY xxxff' and should point to the site chapters. Papers in Part B will normally require one or more entries under 'Site YYY , ... ' in the subject index under 'S'. Site as a second-level term is not inhibited.

The use of geographic entries at the first level is to be restricted to where it is necessary to point the reader to a discussion of the features of a broad area or region. First level geographic entries are not to be used for work that relates to a specific site – site entries are to be preferred as they are shorter and more specific. For similar reasons, site entries and not geographic terms are also preferred at the second level for work that relates to a specific site, particularly in the Taxonomic index.

Because a two-level indexing scheme will increase the number of page-numbers per index entry, attempts should be made to reduce this number in other ways. This might be done by (a) selecting the more significant entries, (b) by indicating a range of pages where the reference is continuous or (c) by using the form XXXff where the reference is not sequential.

Printing the index

In general the present format should be followed. The two-level structure will improve the ease of use. First and second level terms should be in lower case except for proper names. References to tables, figures and text are not differentiated.

In the cumulative index the entries should appear as XXX/ZYYY. where XXX = leg number, YYY = page number(s) and Z is an 'a' or 'b' for Part A and Part B.

It would improve the clarity of the index if (1) running heads were used at the top of each page (in bold type), as in the current DSDP cumulative index; (2) vertical rules were used between columns, as in the latest ODP volume indexes. No existing index includes BOTH of these features.

Nomenclature guidelines

The IHP believes the present DSDP Cumulative index, and to a lesser extent the ODP volume indexes, to have very serious drawbacks, not least in that information on one topic is dispersed (and hence lost) under different headings, and conversely, information on several unrelated topics is subsumed under a single heading. For example, in the DSDP Cumulative Index, information on potassium occurs under both 'K' and 'potassium', while the 'K' entry also subsumes information on magnetization ratios and various other types of constants. Similarly, information on 'titanite' also occurs under 'sphene', and information on 'plagioclase' under 'feldspar, plagioclase', 'labradorite' and so forth.

Although the DSDP cumulative index, by its very bulk and complexity, demonstrates these problems at their worst, they are still obvious in ODP indexes. For example in vol.117, information on apatite is also dispersed under 'fluorapatite' and 'phosphate', on clays under 'clay mineralogy' and under individual minerals — still with insufficient cross-referencing to guide the user.

The following recommendations are intended to overcome these drawbacks: (1) Internationally approved terminology for rocks and minerals (i.e. IUGS, IMA) should be adhered to in the indexes, even where it is not followed in the texts. (2) Synonyms and equivalences should be actively rooted out at the editorial stage, and all such citations should appear under ONE entry. Specifically, chemical elements and formulae must always appear under the FULL NAME, not the symbol — 'potassium', NOT 'K'; 'potash' NOT 'K2O'. A note to this effect can appear in the preamble, or 'see' entries can be added under the symbols: for example: 'K, SEE potassium'. (3) Ambiguous entries must be elaborated in brackets: for example, 'K (magnetization ratio)' versus 'K (see potassium)'; 'C (programming language)' versus 'C (see carbon)'. (4) Hierarchical terms need special consideration. In a 2-level scheme, we suggest indexing under a suitable lower level and cross-referencing to higher orders. For example, information on feldspars should be listed under individual minerals (albite, orthoclase, etc.) and cross-references should appear under 'feldspar', 'plagioclase' of the form 'SEE individual minerals'. This is similar to the current entry 'see benthic forams, planktonic forams', under 'Forams'. (5) Adjectival modifiers should NOT be indexed; the appropriate place is to index under the noun. For example, from the DSDP cumulative index, 'chrome spinel' should have appeared under 'spinel, chromian', 'K-nontronite' under 'nontronite, potassian'. This specifically follows IMA rules as under recommendation (1) but applies to other terminology also.

Editorial process

We recommend that an approved list of index terms be drawn up, combining the AGI Thesaurus with more recent international recommendations (IMA, etc.) A qualified geological editor should be employed to check first drafts drawn up by the indexers against this approved list. The following four possibilities exist for each term: 1. Term is in approved list: index as normal. 2. Term has an approved synonym, indicated by 'SEE': all index entries MUST appear under the approved synonym. For example, no page entries should appear under 'sphene', all should appear under 'titanite'. 3. Term is ambiguous (indicated by bracketed explanation): the editor will need to separate out those entries that refer to different entities; for example, 'K' referring to potassium or 'K' referring to magnetization ratios. 4. Term is not on approved list at all: reference should then be made to AGI Glossary for guidance. If an alternative is suggested, use that, otherwise use discretion to add to list.

Conclusion

In view of the wide-ranging nature of the above changes, we recommend that a new RFP process be initiated covering the preparation of future indexes. Initially the above editorial review process would best be implemented via in-house checking by a staff geologist. IHP would value the opportunity to inspect any revised index before it is printed.

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United States Department of the Interior

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IN REPLY REFER TO:

November 12, 1991

Memorandum

To: James Austin, Chairman, JOI-PCOM

From: Mahlon M. Ball, Chairman, JOI-PPSP 11/13

Subject: PPSP meeting of 10/24/91

This meeting was held in a conference room of the Scripps Institution of Oceanography, San Diego, California.

Attendance:
Mahlon Ball, JOI-PPSP
George Claypool, JOI-PPSP
Claude Delas, JOI-PPSP
Mimi Fortier, JOI-PPSP
George Gamsahurdia, JOI-PPSP
Dietrich Horn, JOI-PPSP
Martin Hovland, JOI-PPSP
Barry Katz, JOI-PPSP
Kevin Burke, ODP Safety Panel
Thomas Thompson, ODP Safety Panel
Henk Wories, ODP Safety Panel
Audrey Meyer, TAMU-ODP
James Austin, JOI-PCOM
Jerry Winterer, Chief Sci. Leg 143
Janet Haggerty, Chief Sci. Leg 144
Graham Westbrook, Chief Sci. Leg 146
Casey Moore, Advocate Leg 146

Mahlon Ball opened the meeting by requesting self introductions from and circulating a signature list to attendees.

Jerry Winterer welcomed attendees to Scripps. Winterer and Janet Haggerty then led a discussion of the regional geology and scientific objectives including drilling strategy, logistics, and safety considerations for legs 143 and 144: atoll and guyot drilling in the Northwest Pacific.

From the standpoint of potential safety and pollution hazards, there are strong indications that neither oil and gas source rocks, conditions necessary for maturation of source materials, nor seals will be encountered on the atoll and guyot drilling. Previous drilling has shown the sediments in these settings are oxidized and lacking in significant amounts of potential oil and gas source materials. No evidence of sealing conditions exists. Available temperature measurements indicate open circulation of sea water within the section in which drilling is contemplated. The single basinal site in a sediment apron off Pikinni (Bikini) in the Marshall Islands appears to be similar to other previously drilled seamount apron sites and does not present apparent dangers related to potential safety or pollution problems. The safety panel concluded that the proposed drilling on atolls and guyots of the Northwest Pacific will be reasonably safe.

Winterer and Haggerty then led a site-by-site discussion of holes planned for legs 143 and 144. Sites approved by the Safety Panel are as follows:

All-A	Approved to a sub-bottom penetration of 720 m at Latitude 18° 27' N and Longitude 179° 32' W.
Huevo-A	Approved to a sub-bottom penetration of 1000 m at Latitude 21° 19 'N and Longitude 174° 18'E.
Huevo-B	Approved to a sub-bottom penetration of 400 m at Latitude 21° 22' N and Longitude 174° 18' E.
Syl-3	Approved to a sub-bottom penetation of 820 m, in 4800 m water depth, at Latitude 11° 00' N and Longitude 164° 45' E.
Har-1	Approved to a sub-bottom penetration of 450 m at Latitude 5° 29' N and Longitude 172° 20' E.
Har-2	Approved to a sub-bottom depth of 200 m at Latitude 5° 33' N and Longitude 172° 21' E.
Pel-3	Approved to a sub-bottom depth of 450 m at Latitude 10° 07' N and Longitude 163° 48' E.
Sly-1	Approved to a sub-bottom depth of 400 m at Latitude 11° 59' N and Longitude 164° 56' E.
Syl-2A	Approved to a sub-bottom depth of 150 m at Latitude 11° 54' N and Longitude 164° 55' E.
MIT-I(E)	Approved to a sub-bottom depth of 820 m at Latitude 27° 02' N and Longitude 152° 08' E.

Seiko 1 Approved to a sub-bottom depth of 200 m at Latitude 34° 13.3' N and Longitude 144° 18.7' E.

Seiko 2 Approved to a sub-bottom penetration of 250 m at Latitude 13° 13.5' N and Longitude 144° 19.5' E.

Audrey Meyer then led a discussion of plans for drilling a hole in the shallow lagoon of Eniwetak Atoll to test the limits of Joides Resolution's drilling capabilities in shallow water.

Site EWK-1 Approved to a sub-bottom penetration of 400 m in approximately 51 m water depth, at Latitude 11° 24.4' N and Longitude 162° 18' E, in Eniwetak lagoon.

Because spud-in conditions may be difficult at atoll-guyot sites and safety and pollution hazards are considered minimal for these sites by the Safety Panel, advance approval for site relocation to improve spud-in prospects is granted.

Claude Delas remarked on the marginal quality of the vintage seismic data available for selection of atoll and guyot sites. These data would not satisfy reuqirements for adequate reflection seismic coverage in settings where potential for occurrence of hydrocarbons is high. David McKenzie made the point that judging data quality, beyond making decisions relative to adequacy or inadequacy at specific sites, was not the job of the Safety Panel. James Austin assured the Safety Panel that the Site Survey Panel could be depended upon to insure that drilling proponants and chief scientists provide data of quality sufficient to enable safety decisions to be made.

Graham Westbrook and Casey Moore gave a preview of drilling plans and discussed scientific objectives and safety considerations for leg 146; the Cascadia accretionary prisms. From these discussions it is clear that, in terms of quality and quantity of site survey data, the Cascadia prism is one of the best studied examples of this particular margin setting. The multichannel seismic reflection data set together with sidescan-surveys, regional heat flow information, and observations from research submersibles, constitute a unique combination of measurements for use in selecting drill sites and interpreting drilling results in this area. It is also apparent, however, that the structure of this region is complex, potential for reservoirs and seals is present, and conditions for maturation of hydrocarbons are extant. Sufficient methane is present for formation of clathrates as evidenced by the presence of bottom simulating reflections. George Claypool pointed out that presence of some free gas below the base of the hydrate layer is a geochemical requirement for satisfaction of the phase rule at the clathrate base. Westbrook stated that, judging from seismic modelling by Roy Hyndman, the thickness of any such layer of free gas is probably not significant (20 m or less). The safety panel will approach selection of sites for this leg with caution. Results from leg 141, the Chile Triple Junction will be important input for decisions to be made concerning the Cascadia drilling.

Meyer reviewed drilling results for legs 138 and 139, the East Pacific Transect and the Sedimented Juan de Fuca Ridge, respectively. Leg 139 results were of particular interest to the Safety Panel because they involved potential hydrogen sulfide (H_2S) hazards. Downhole flow of seawater with a calculated rate of 10,000 liters/min. apparently obviated any possibility of flow and release of hot formation water or H_2S up the drill column. The Safety Panel asked that Alan Williams, member of the panel's ad hoc committee on high temperature and hydrogen sulfide drilling hazards, be asked to review leg 139 results and comment on how these results may pertain to drilling on the East Pacific Rise, leg 142, another location where high temperatures and hydrogen sulfide may present problems.

Minutes of the previous meeting were approved. Ball agreed to submit the new safety guidelines to Austin by January 1992. McKenzie agreed to assist Ball in the final editing of the guidelines.

Austin reviewed Planning Committee activities. It is apparent that potential for hydrocarbons on some proposed Atlantic drilling legs may necesitate previews of these legs by the Safety Panel.

The Safety Panel agreed to hold its next meeting at Lamont Doherty Geological Observatory on March 10-11, 1992, pending PCOM approval.

EXECUTIVE SUMMARY

Panel discussions and recommendations were focussed on **review of each of the shipboard laboratories; upcoming legs**; an implementation plan for **core-log data integration (joint with DMP); discrete measurement of index properties**, and **panel membership.** In addition, the panel held a one day meeting on **core disturbance.** The following is a summary of SMP concerns and recommendations.

Shipboard labs review

J-P Valet reported that the paleomagnetics laboratory is now in very good shape; the cryogenic magnetometer is working very well and the software upgrades which TAMU have incorporated show major improvement. The major problem in paleomagnetics is core barrel magnetic overprinting. On Leg 138, the problem was so severe that the core barrel used could be identified in the magnetic signature of the sample. Consequently, **the panel recommends that (a) a core barrel de-magnetizer be constructed and available for shipboard use; and (b) a magnetometer for measuring the field inside the barrel be supplied for shipboard use (91-7: to TAMU).**

R. Wittebrood (Shell - Canada) presented a natural gamma core logger which his lab built and has successfully used. The panel agreed that this equipment is very feasible and reasonably priced for ODP shipboard use. The panel has previously recommended the acquisition of this equipment and emphasizes the need for its use as one of two possible direct core-log data integration tools. Based on the advice of Wittebrood, **the panel further recommends that a natural gamma core logging device be added to the multi-sensor track and, if the incremental cost of adding spectral gamma is low (on the order of 15% of the total cost), spectral gamma should also be included (91-8: to TAMU; BCOM).**

On Leg 138, a problem was identified with the GRAPE data. Shipboard scientists reported that the GRAPE was routinely measuring densities 10% too high on high porosity sediment. The error decreased with decreasing porosity, suggesting that the gamma ray attenuation coefficient was not appropriate for the sediment type. The findings on Leg 138 suggest that GRAPE data for all of ODP, starting with Leg 101, may be incorrect. **The panel recommends that an immediate review of the findings from Leg 138 take place and that appropriate attenuation coefficients be incorporated into the GRAPE software prior to Leg 143 (91-9: to TAMU).**

The panel has previously recommended that a micropalaeontological reference slide collection should be available for shipboard use with a duplicate at ODP/TAMU. No action has occurred. The panel agreed that **the reference slide collection is a critical and basic tool** in the micropalaeontologic laboratory. **The panel recommends that a reference slide collection for foraminifers, diatoms and nannofossils be acquired and maintained for shipboard use with a duplicate set available at TAMU (91-10: to TAMU; BCOM).**

The panel discussed the issue of technical support. Although PCOM has not yet discussed the panel's recommendations on requirements for additional technical support, SMP agreed that within the existing staff, additional basic training is required. **SMP recommends that some of the**

technical staff should specifically be trained in micropalaeontological sample processing for the four most commonly studied groups of marine microfossils: planktonic and benthic foraminifers; calcareous nannofossils; radiolarian; and diatoms (91-11: to TAMU).

M. Mottl reported on the results of the geochemistry survey. Based on the responses, the geochemistry community concurs with the PCOM decision to terminate routine OG sampling. However, non-routine OG sampling will certainly be required and therefore the facilities for sampling and storing should be maintained. In addition, the existing collection of frozen samples should be retained and kept frozen. **SMP recommends that the existence of the frozen core collection should be advertised to the scientific community so that sample requests can be made and that samples should be maintained frozen for a minimum time period (e.g., 10 years post collection) following which, they should be split and returned to the split core collection (91-12: to PCOM; TAMU).**

The panel reviewed the units used in reporting shipboard data. **SMP recommends that SI units be used in all laboratories (except geochemistry) for reporting shipboard-measured data (91-13: to IHP; TAMU).**

The panel once again reviewed previous recommendations regarding smear slides with J. Syvitski, a guest sedimentologist. Based on this review, the panel unanimously agrees that smear slide analysis is qualitative, not quantitative. By storing these data in the database as values gives these data a level of accuracy far greater than the current analysis yields. **Therefore, the evaluation of smear slides should not be recorded as absolute percentages; rather the percent composition should be represented by descriptive terms. As a guide to shipboard sedimentologists, ranges of percent composition should be identified with each term as follows (90-14: to IHP; TAMU)**

- **TRACE <1%**
- **RARE 1 - 10%**
- **UNCOMMON 10-30%**
- **COMMON 30-60%**
- **ABUNDANT >60%**

Upcoming Legs

The panel previously identified the Atolls and Guyots legs and the Cascadia leg as requiring special consideration. Procedures for elemental analyses using the XRF are required for calibration of the geochemical logging tool for both Atolls and Guyots legs and M. Rhodes is currently preparing some draft recommendations which will be presented at the port call prior to leg 143. In addition, core recovery may be very low at all sites on this leg if site locations remain at the Atoll/Guyot highs. **The panel encourages the program to expedite the acquisition of the natural gamma core logging tool so that the best possible core-log data integration tools are available for these legs.** The panel is still concerned that limited log data will be acquired on Leg 146 to Cascadia. **SMP emphasizes that physical property, structural geological and pore water geochemical core data have previously provided results which have been the backbone of major advancements in the study of active margins. The collection of these data coupled with downhole discrete**

measurements should be given highest priority. Highest priority means very high resolution sample intervals for these three data sets, of the same order as Leg 131 with appropriate time allocated to downhole tools.

Shipboard Integration of Core and Log Data (joint with DMP)

DMP and SMP met jointly on 17 October to review and prepare an implementation plan for core-log data integration. The panels agreed that routine shipboard integration of core and log data is a very high priority and that implementation should proceed immediately. **In addition to a review of required equipment, the panels prepared a list of critical tasks which must be addressed to successfully implement routine shipboard core-log data integration (91-16: to PCOM; TAMU) as follows:**

- **quantify methods of depth measurement for drillpipe and wireline**
- **refer all depths to the gamma log**
- **develop interactive graphics for depth matching**
- **establish a relational database with an adequate structure for shipboard and shorebased access of core and log data**
- **create the position of *Data Correlation Specialist* as a member of the shipboard scientific party**
- **disseminate data to the scientific party in a readily transportable format**
- **support related development work currently taking place at ODP/TAMU**

Discrete Measurement of Index Properties

Although improved recommended procedures for measurement of index properties have been prepared by the panel, sailing physical property specialists have had problems following the procedures. It appears that the panel, in developing these recommendations, has put too much choice in the hands of the sailing scientist. The panel will immediately review and upgrade the recommended procedures prior to Leg 141. In addition, the panel discussed the possibility of replacing the current direct methods for measurement of bulk density with an indirect method. The panel is encouraged by the potential application of CATSCAN technology which can potentially be used in all types of sediment/rock samples collected including those that have suffered from severe 'biscuit' disturbance. The panel will focus on this technology at the next meeting.

Shipboard Equipment Requirements (to BCOM)

Shipboard equipment needs were again reviewed. Equipment requirements, in priority order, are as follows:

- Natural gamma and MST upgrade
- Reference slide collection
- Computer workstation for core-log data integration
- Resistivity equipment for discrete core measurement
- Core barrel magnetometer
- Colour measurement instrument
- Carbonate autosampler
- New IC (replacement)

- Xerox for whole core imaging of hard rock samples

The panel is concerned that the navigation equipment, which had previously been approved for acquisition, has not yet been purchased. This equipment is still a high priority.

Core Disturbance Meeting

Following the SMP and joint DMP/SMP panel meetings, a subset of members from the panels and additional guests met to review core disturbance problems and recommend improvements. A report was prepared by R. Chaney; a summary of the meeting recommendations are as follows:

- The potential for incorporating accelerometer packages into the core barrels and in the BHA for post-coring assessment of sample quality should be investigated.
- A pipe maintenance/inspection program should be followed with emphasis on maintenance whereby re-coating of the pipes occurs frequently enough to significantly reduce rust contamination.
- In conjunction with pipe maintenance, evaluation of rust contamination should be included as part of the duties of the shipboard paleomagnetics specialist.
- A review and re-design of the APC cutting shoe should be made with the intention of optimizing the area ratio to reduce core disturbance. A design similar to the reduced area ratio cutter used on Leg 90 would be appropriate.
- A strong back tray should be used to carry the working split core from station to station in the core laboratory.
- The XCB sampling history should be documented. Included in this review should be XCB version, sediment type cored; and the type and extent of core disturbance.
- Sediment core disturbance from effective stress release should routinely be corrected using consolidation data rebound curves. Therefore, consolidation measurements should routinely be made in shorebased laboratories for each lithology per site.

Panel Membership

The panel discussed rotation of members. Both Richards and Whitmarsh will be rotating off the panel after their three year terms are complete (March '92). They will be replaced by nominations from ESF and the UK, respectively. To maintain continuity, the panel would prefer that a maximum of two members at one time be rotated. **The panel does not yet have representation in sedimentology and recommend the addition of one more panel member to fill this need (91-15: to PCOM).** The two names will be forwarded to the PCOM chair.

000297

DRAFT
(28 Oct '91)

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Ans'd.........

JOIDES SITE SURVEY PANEL MINUTES

October 8-10, 1991

Ocean Research Institute
Tokyo, Japan

Members: Kidd, Rob (University of Wales, Cardiff, UK)-Chairman
Farre, John (EXXON, USA)
Hirata, Naoshi (Chiba University, Japan)
Kastens, Kim (LDGO, USA)
Larsen, Birger (Geological Survey of Denmark, ESF)
Lewis, Steve (USGS, Menlo Park, USA)
Louden, Keith (Dalhousie University, Halifax, Canada)
Meyer, Heinrich (BGR, Germany)
Pautot, Guy (IFREMER, France)
Von Herzen, Dick (WHOI, USA)

Liaisons: Ball, Mahlon (PPSP)
Blum, Peter (JOIDES Office, UT)
Firth, John (ODP/TAMU)
Taira, Asahiko (PCOM)

Apologies: Brenner, Carl (Site Survey Data Bank, LDGO)
Moore, Greg (HIG, USA)
Trehu, Ann (Oregon State University)
Zverev, Sergei (Institute of Earth's Physics, Moscow, USSR)

000298

JOIDES SITE SURVEY PANEL MEETING, TOKYO, OCTOBER 1991

EXECUTIVE SUMMARY

The main business of the SSP's Tokyo meeting was to furnish PCOM with initial assessment of the status of site survey data in support of drilling programmes under consideration for the FY'93 North Atlantic schedule. In the event the system that resulted in the ranking of the proposals to form the "North Atlantic Prospectus" (NAP) leaves SSP with no time to respond on the quality of the data quoted in them. Almost no data was submitted for this meeting and we concerned ourselves with providing PCOM with our best assessment of the likely availability of appropriate survey data to supporet each proposal. SSP reached the following consensuses in Tokyo (Items 11 to 22 refer specifically to NAP programmes):

SSP Consensus 1: SSP revised its watchdog assignments for this meeting to include :

Mediterranean Ridge	(330)	--- Farre
VICAP Gran Canaria	(380)	--- Von Herzen
Ceara Rise	(388)	--- Meyer

SSP Consensus 2: Because of our infrequent meetings and the commonly occurring need for multiple iterations, SSP normally needs 2 years lead time to compile and evaluate the data for a drilling leg. If the thematic review process produces high priority programs with a shorter lead time, we will make a best effort to evaluate them. However, in such cases the burden will be on the proponents to present, without delay, a complete high quality data package to SSP.

SSP Consensus 3: It is clear that updates on proposal reviews by thematic panels, and sometimes entirely new highly ranked proposals arise such that SSP cannot efficiently deal with them within the present sequencing of Panel meetings. SSP recommends that thematic panels meet about 1 month in advance of SSP leaving us with about 1 month to pass our comments to PCOM. The sequences of meetings are suggested as:

PANEL	SPRING MEETING	AUTUMN MEETING
THEMATIC	FEB. TO EARLY MAR.	LATE SEPT TO MID OCT
SSP	LATE MAR TO EARLY APR.	LATE OCT TO EARLY NOV.
PCOM	MID TO LATE APRIL	LATE NOV. TO EARLY DEC.

SSP Consensus 4: SSP will continue updates to its guidelines at its next spring meeting for JOIDES Office's proposed new 'ODP GUIDE'. They may include requirements for:

BSR Drilling.
Offset Crustal Drilling.
Deep-towed geophysical surveys.

SSP Consensus 5: Augmentation of Site Survey data packages has rarely taken place through use of "ships of opportunity". Hence SSP members will no longer be asked to provide their country's ship schedules for inclusion in the SSP minutes. However, SSP members are still encouraged to be cognizant of planned ship operations so that they can serve as initial contacts for possible site survey augmentation efforts.

SSP Consensus 6: SSP notes the possible discrepancy between observed and estimated basement depths encountered during Leg 139. Based on analysis of these results together with experience with future EPR drilling, we will consider at our next meeting making deep source seismic profiles a requirement for future mid-ocean ridge/fracture zone sites with crustal objectives.

SSP Consensus 7: As of our meeting, a decision is expected within the week as to whether the *Resolution* will drill Hess Deep in the second half of the current leg (Leg 140). No data whatsoever from Hess Deep has been received at the ODP Data Bank.

SSP wishes to express its concern and dismay that the system of checks and balances, which normally ensures that an adequate data package is available to the ODP community, appears to have been circumvented. SSP urgently looks forward to working with proponents on the data package for future Hess Deep drilling.

SSP Consensus 8: SSP Chairman (Kidd) should request of PCOM Chairman that an SSP member (Kastens) attend the next meeting of the Offset Drilling WG to contribute to discussions of survey requirements, some of which are as yet unclear to SSP itself.

SSP Consensus 9: SSP are happy to approve the data package presented for the Enewetak test drilling. On the other hand, SSP notes that comparisons of the seismic and borehole evidence here with those over other atolls and guyots projected for basement drilling suggest that possible drilling times to basement need to be very carefully assessed for Legs 143 and 144. SSP recommends a local pre-drilling survey by JOIDES resolution over Huevo Seamount and consideration be given to similar surveys over Alison & MIT if basement objectives prevail.

SSP Consensus 10: The site survey data for Cascadia drilling is complete and need not be considered further by SSP. Final approval of hydrate drilling falls under the mandate of PPSP.

SSP Consensus 11: No data has been received at the Data Bank concerning the **Alboran Sea or Atlantic-Mediterranean gateway (proposal 323 Rev)**, but the proposal gives the impression that there is a lot of good quality regional and site specific data in this area that could be gathered together in time for FY'93 drilling.

SSP Consensus 12: For the **Mediterranean Ridge Proposal (330)**, SSP separates the shallow penetration sites (MR-2, MR-6 and MR-7) from the remaining 5 deep penetration sites. With collection of the planned data, SSP sees no problem with assembling a suitable data package for the shallow penetration sites. Successful drilling of the deep penetration sites will require adequate imaging of the Messinian evaporite and pre-Messinian strata in the upcoming 1992 MCS surveys. SSP is concerned that the quality of the MCS data may not be sufficient to image the sub-salt strata and that selection of the deep penetration sites may prove problematic.

SSP Consensus 13: The data set outlined in the proposal for **Equatorial Transform Margin Drilling (346A)**, and the processing that has been carried out or is scheduled by proponents, should provide a high quality package for SSP assessment. The newly processed data should be deposited in the Data Bank for review at the Spring SSP Meeting. Existing heat flow values or newly gathered measurements would be useful in completing this package but are not deemed critical at this stage.

SSP Consensus 14: The data collected for the **New Jersey Sea Level Mid-Atlantic Transect (proposal 348-ADD)** is of excellent quality and sufficient quantity (example records were viewed in this case). SSP notes that seismic processing of high quality would benefit greatly both pre-drilling site selection and post-drilling scientific interpretation, and recommends proponents to pursue this goal in the interests of maximising the return from the surveys and potential drilling.

SSP Consensus 15: The bare rock drilling proposed for the **TAG area (proposal 361Rev)**, with penetrations envisaged ranging from 300 to 1km, will require a site survey package rivaling that for the Sedimented Ridges . SSP recognises the existence of a great deal of TAG data that could be lodged with the Data Bank but notes the obvious need for further seismic data (all "required/not available") along with heat flow, further photography and sampling and deep-towed magnetics.

SSP Consensus 16: SSP requests that a preliminary site survey data package be assembled for **VICAP proposal (380) Rev2** as early as possible. The Panel is concerned that the quoted MCS data may not be currently adequate to address objectives relating to basement and lithospheric deformation. Commercial MCS data referred to in the proposal might allay these concerns. The GLORIA survey planned to identify areas of sediment slumping will not address early slumping phases in the development of the apron and again extensive high resolution MCS and SCS will be a requirement.

SSP Consensus 17: Although no adequate survey package yet exists to support the **Ceara Rise proposal (388)**, a funded U.S. cruise proposes to carry out an optimal combination of geophysical techniques and thus the likelihood is that a complete data set will be available for this shallow APC/XCB drilling.

SSP Consensus 18: No specific sites are proposed in this **Mediterranean Sappropels "concept" proposal (391)** so SSP finds it difficult to comment on survey aspects of this proposal; other than to note the proponent's suggestions that their largely shallow objectives might be incorporated in the Mediterranean Ridge proposal (330) or in the APC coring at existing DSDP sites.

SSP Consensus 19: None of the seismic data for the **North Atlantic-Arctic Gateway (NAAG) DPG Program** are in the ODP Data Bank and proponents are urged to begin sending their material soon. In order to keep the program flexible enough to respond to the changing ice conditions, it is important that both the prime drilling sites mentioned in the DPG report as well as alternate sites meet the SSP requirements. Additional site survey data which will be collected in 1992 must be processed and ready for assessment as early as possible. In general, seismic data illustrated in the proposals are very low frequency so details of importance for the planning and interpretation of drilling results are not visible. Higher frequency processing or collection of high resolution SCS will be required. Data on frequency and size of ice-rafted debris should be compiled in order to select proper drilling methods. Sidescan coverage should be able to provide some indications of seafloor dropstone concentrations.

SSP Consensus 20: The data illustrations included for the **North Atlantic Rifted Margins (NARM) DPG Program** in the North Atlantic Prospectus suggest that existing data for the four proposed transects are adequate for site selection, despite SSP's inability to carefully evaluate overall data quality from page-size presentations. Proponents involved in future site survey data acquisition (7/92, Newfoundland Basin; Fall 1991, Iberia Abyssal Plain; 1992 and 1993, East Greenland) should consult with SSP and PPSP watchdogs for specific site survey and safety concerns. SSP anticipates evaluating data packages of scheduled NARM drilling programs at its Spring'92 meeting.

SSP Consensus 21: There already exists a considerable site survey data package for the **MARK area proposal (369A)** but SSP notes that there are no transverse MCS lines which run through the proposed sites. We consider that the data are not yet sufficient for the objectives posed. Some attempt to understand the deep structure should be part of the survey stage, in particular, the reason for the existence of the uplifted target block should be addressed. SSP expects that the additional site surveys, including the planned sidescan sonar cruise, will do much to update the database. Deep source seismic surveys may prove to be desirable when SSP revises its guidelines.

SSP Consensus 22: SSP considers that a reasonable site survey package could be gathered in support of the **Vema FZ proposal (376 Rev)** should planned survey cruises take place. A preliminary package should be submitted to the Data Bank for appraisal at SSP's Spring meeting. We note that critical sidescan surveys are not scheduled to take place until 1993 to complement the existing MCS and refraction data. SSP recommends additional collection of deep source seismics and OBS data.

SSP Consensus 23: Kidd to relay to PCOM a request that, should they schedule drilling in FY'93 that is clearly dependent on the collection of further site survey data, PCOM should define a back-up alternate leg to take place in the event that the surveys are not completed. This is to put responsibility and pressure to deliver on proponents. SSP would in turn discuss cruise plans and required data processing, liase closely with proponents and possibly meet more frequently in abbreviated session to view data with proponents.

SSP Consensus 24: SSP recommends to PCOM that the term of membership of its Panel date from first attendance and that terms for SSP members be 4 years rather than 3 to allow for the full progression of a set of proposals during their stewardship.

SSP Consensus 25 : Steve Lewis of USGS, Menlo Park and Heinrich Meyer of BGR, Hannover retire from the Panel after this meeting as part of SSP's review of its membership. The Panel expresses its thanks to Steve and Heinrich for their hard work as long-standing SSP members. Steve is recognised as a particularly tenacious "watchdog" whose activity will be sorely missed. SSP wishes him the best of luck as co-chief for the Chile TJ drilling.

SSP TOKYO OCT'91 - ACTION ITEMS

Action Item 1: Kidd to relay to Panel Chairmen and PCOM at the December meetings in Austin that North Atlantic proponents of Legs that get on the FY'93 schedule should begin submitting data to the Data Bank for review at SSP's Spring meeting. SSP Watchdogs to follow-up after the Austin PCOM with contacts to proponents.

Action Item 2: Kidd to raise suggested new timing of SSP versus Thematic Panel meetings at the Austin PANCHM and PCOM meetings

Action Item 3: Kidd will circulate the finalised version of the last SSP meeting minutes with the draft of the present one.

Action Item 4 : TAMU representative (Meyer?) at the Spring'92 SSP meeting is asked to bring for analysis tables of estimated versus drilled depths to basement for Leg 139 and estimated versus drilled thickness of rubble zone on Leg 142.

Action Item 5. SSP Chairman (Kidd) should request of PCOM Chairman that an SSP member (Kastens) attend the next meeting of the Offset Drilling WG to contribute to discussions of survey requirements, some of which are as yet unclear to SSP itself.

Action Item 6: Larsen to check N. Pacific sites with basement objectives that have been relocated. Kidd to be notified result prior to Austin PCOM Meeting.

Action Item 7: Hinz to assume H.Meyer's watchdog role for Ceara Rise proposal 388.

Action Item 8: SSP watchdogs should not contact proponents with news of SSP Tokyo assessments until it is known which of the NAP proposals were selected by

PCOM for the FY'93 schedule. It should be stressed to these proponents that they should submit all available data relating to their proposals to the Data Bank for assessment prior to and during the next SSP meeting in April '92.

Action Item 9: Kidd to relay to PCOM a request that, should they schedule drilling in FY'93 that is clearly dependent on the collection of further site survey data, PCOM should define a back-up alternate leg to take place in the event that the surveys are not completed. This is to put responsibility and pressure to deliver on proponents. SSP would in turn discuss cruise plans and required data processing, liase closely with proponents and possibly meet more frequently in abbreviated session to view data with proponents.

Action Item 10: The Panel discussed likely US replacements for Steve Lewis who would cover his particular MCS seismics expertise and Kidd has two names to relate to PCOM Chair Austin.

Action Item 11: Kidd should request the next SSP meeting in Copenhagen, hosted by Larsen at the Denmark Geological Survey, spanning the dates 2nd, 3rd and 4th April 1992.

000306

JOIDES SSP MEETING: ORI, TOKYO, 8-10, OCTOBER, 1991

AGENDA

1. PRELIMINARY MATTERS
   - (i) Introduction + New Assignment of Proposals for this Meeting (Kidd)
   - (ii) Logistics (Hirata)
   - (iii) Outline of N. Atlantic Prospectus and other JOIDES Office/PCOM Items (Blum)
   - (iv) Update on new SSP guidelines + S-proposals (Blum)
   - (v) TAMU Meeting: Minutes changes & Matters arising
   - (vi) Updated Ship Schedules (Kidd)
   - (vii) Other business for Agenda (Kidd)

2. REPORTS:
   - (i) PCOM (Tiara)
   - (ii) JOIDES Office (Blum) - see above
   - (iii) TAMU (Firth)
   - (iv) PPSP (Ball)
   - (v) DATA BANK

     DPG's:

     N. Atlantic Gateways (Larsen)
     N. Atlantic Rifted Mgns (Blum)
     Atolls & Guyots (Blum)

     WG's:

     Offset Drilling (Blum)
     Sea Level (Blum)

3. SCHEDULED LEGS - FY '92
   - (i) Chile Triple Junction (Lewis)
   - (ii) East Pacific Rise (Lewis)
   - (iii) Atolls & Guyots (Firth)
   - (iv) Enewetak Engineering (Firth)
   - (v) N. Pacific Neogene (Larsen)
   - (vi) Cascadia (Louden)
   - (vii) Hess Deep -status if not drilled on 140 (Firth)

4. STATUS OF N. ATLANTIC PROGRAMS

   Assessment of the North Atlantic Prospectus of proposals prepared by JOIDES Office.

PROSPECTUS:

1. Mediterranean Gateway - proposal 323/Rev -- KASTENS
2. Mediterranean Ridge ("new") - proposal 330 -- FARRE
3. Equatorial Atlantic Transform Margin - proposal 346/A -- PAUTOT
4. New Jersey Margin Sealevel - proposal 348 + 348/A -- KASTENS
5. TAG Area: High-temperature Hydrothermalism - proposal 361/Rev -- LOUDEN
6. VICAP Gran Canaria "new"- 380 (Rev) + Rev 2 -- von HERZEN
7. Ceara Rise 388 "new"-- H. MEYER
8. Mediterranean Sapropels "new"- proposal 391 -- KIDD
9. NAAG-DPG: Arctic Gateways - proposals 305, 320, 336 -- LARSEN
10. NARM-DPG: volcanic - proposals 392-396
    non-volcanic - proposals 334,365
    Rev' Galicia Margin 334 & GB-Iberia
    plume volc. 363 -- LEWIS
11. MARK area: long section of upper mantle (MAR Offset Drilling) - proposal 369, 369/Rev, 369/A -- HIRATA
12. Vema FZ: Proposal 376/Rev-- HIRATA

[OTHERS:

(Agreed in 1(i) and 1(iii) not to discuss these items this meeting)

13. Barbados Accretionary Wedge - proposals 378/A & 372/A -- KIDD
14. West Florida Margin Sea Level - proposal 345/A -- MOORE
15. Caribbean Crust - proposal 343 -- FARRE
16. Cayman Trough - proposal 333 - KIDD]

000307

7. OTHER BUSINESS
(i) Revised watchdog assignments (Kidd)
(ii) Feedback to Proponents (Blum)
(iii) PANCHM/PCOM Report
(iv) Panel Membership (Kidd)
(v) Next meeting [Spring "92 USA?]

APPENDICES WITH THESE MINUTES

1. Proposal Ranking Oct '91
2. New SSP Guidelines
3. Updated JOIDES schedule
4. SSP matrices as of Tokyo Oct '91 Meeting

SSP TOKYO-DAY ONE

000308

1. PRELIMINARY MATTERS

(i) Introduction

Chairman Rob Kidd opened the meeting at 0900. He outlined the general aims of this meeting which were now orientated entirely around the need to provide PCOM with preliminary reviews of proposals in the North Atlantic Prospectus. Only a few proposals new to SSP were in the Prospectus and some watchdog assignments assignments would have to be made.

SSP Consensus 1: SSP has revised its watchdog assignments for this meeting to include :

Mediterranean Ridge	(330)	--- Farre
VICAP Gran Canaria	(380)	--- Von Herzen
Ceara Rise	(388)	--- Meyer

We agreed that SSP would not at this meeting provide preliminary reviews on any of the proposals not included in the North Atlantic Prospectus and so proposals in the "Others" category were removed from the Agenda. No submitted data would be available for this meeting relating to the Prospectus: our job would be to provide PCOM with preliminary guidance. Our next meeting would definitely expect to begin detailed reviews of submitted data and this message should be forcibly relayed to all Prospectus proponents.

Action Item 1: Kidd to relay to Panel Chairmen and PCOM at the December meetings in Austin that North Atlantic proponents of Legs that get on the FY'93 schedule should begin submitting data to the Data Bank for review at SSP's Spring meeting. SSP Watchdogs to follow-up after the Austin PCOM with contacts to proponents.

Right at the start of the meeting SSP members expressed concern that we were getting into a responsive mode on shortened time scales of less than our optimum 2 to 2.5 years and we were here to have a meeting where very little real data would be viewed. It was pointed out that the thematic panels would meet at about this time and could well add to the proposals tabled in the

Prospectus. Discussion ensued on the very real possibility that some proposals would arrive in our hands so late that we could not ensure an adequate review. On the other hand, the recent publication of more formal guidelines for submission meant that more complete packages might be expected on initial submission. Blum suggested an SSP request for a scheduling of thematic and SSP Meetings to alleviate this problem and this was agreed. It was also agreed that there should be some indication from SSP that it would have some cut-off in how late it would be prepared to review initial site survey data packages. This discussion resulted in the following consensuses:

SSP Consensus 2: Because of our infrequent meetings and the commonly occurring need for multiple iterations, SSP normally needs 2 years lead time to compile and evaluate the data for a drilling leg. If the thematic review process produces high priority programs with a shorter lead time, we will make a best effort to evaluate them. However, in such cases the burden will be on the proponents to present, without delay, a complete high quality data package to SSP.

SSP Consensus 3: It is clear that updates on proposal reviews by thematic panels, and sometimes entirely new highly ranked proposals arise such that SSP cannot efficiently deal with them within the present sequencing of Panel meetings. SSP recommends that thematic panels meet about 1 month in advance of SSP leaving us with about 1 month to pass our comments to PCOM. The sequences of meetings are suggested as:

PANEL	SPRING MEETING	AUTUMN MEETING
THEMATIC	FEB. TO EARLY MAR.	LATE SEPT TO MID OCT
SSP	LATE MAR TO EARLY APR.	LATE OCT TO EARLY NOV.
PCOM	MID TO LATE APRIL	LATE NOV. TO EARLY DEC.

Action Item 2: Kidd to raise suggested new timing of SSP versus Thematic Panel meetings at the Austin PANCHM and PCOM meetings

Kidd continued the meeting with comments that he had received apologies from Greg Moore (change of meeting dates had impacted his teaching schedule); Anne Trehu (no explanation though some indications that there may have been confusion at JOI on her attendance); Carl Brenner (due to illness : SSP members expressed their concern and pass on their best wishes to Carl for a speedy recovery). Taira and Firth were welcomed as substitute attendees in place of Watkins and A. Meyer respectively. Zverev our new Soviet member had not arrived and we were later advised he had no visa. We look forward to Anne and Sergei's attendance at our next Panel meeting.

(ii) Logistics (Hirata)

Naoshi Hirata welcomed the Panel to Tokyo and outlined planning for meals, secretarial support and other logistics. Tiara welcomed SSP to ORI pointing out that we had arrived during a very wet period with floods, interspersed between a series of typhoons - the next typhoon was due as we would be set to leave Tokyo!

(iii) Outline of N. Atlantic Prospectus and other JOIDES Office/PCOM Items (Blum)

At the Chairman's request Peter Blum outlined a number of points relating to the Prospectus and other items that would immediately affect our meeting business.

Prospectus Content: The North Atlantic Prospectus (NAP), September 1991, contains the highest ranked proposals within the area defined by PCOM for drilling during the next fiscal year to be scheduled (1993). The NAP is based on the thematic panel rankings of spring 1991 (Appendix 1). The "highest-ranked" cut-off for proposals to be included in the NAP was defined by PCOM at its August 1991 meeting; thematic panels may include new proposals (now being reviewed) into the prioritization of the NAP (instructions by PCOM chairman). PCOM's charge to SSP was seen to be to provide an "assessment of drillability" of NAP programs, for consideration by PCOM at the Annual Meeting in December. Members noted here that one 'proposal' included in the NAP (Med. Sapropels) and a whole section on offset drilling contained no specific site proposals; they were 'concept' proposals and would prove difficult to review.

Blum requested that SSP use correct proposal numbers according to the JOIDES Office's revised numbering system (introduced at previous SSP meetings), and when referring to the most recent updates. Chairman also requested that henceforth during SSP meetings members declare at the beginning of discussion of individual proposals if they are proponents.

New Proposals: Blum reported that an extremely low proposal submission rate during the summer was followed by extremely high rate from late August to mid September; this trend is likely to continue (because of the popularity of marine studies in the North Atlantic). He suggested that SSP watchdog assignment to new proposals is of little use at this stage, until global prioritization by thematic panels in spring 1992(?!).

(iv) Update on new SSP guidelines + S-proposals (Blum)

Blum commented that the changes to our guidelines had been successfully implemented (Appendix 2) through the efforts of Kastens and Panel comments over E-mail. Kidd noted that we still expect to update the guidelines for BSR's, FZ/Offset drilling, deep-towed geophysical surveys, and possibly other areas. Blum said that JOIDES Office may produce a new "Guide to ODP" during summer '92 and it was agreed that we would discuss these items at our Spring'92 meeting.

SSP Consensus 4: SSP will continue updates to its guidelines at its next spring meeting for JOIDES Office's proposed new 'ODP GUIDE'. They may include requirements for:

BSR Drilling.
Offset Crustal Drilling.
Deep-towed geophysical surveys.

"Geriatic" Proposals: At its last meeting in Hannover, PCOM recommended that proposals which have not been updated for three full calendar years before the present calendar year (ie. January 1, 1988 for 1991 activities; January 1, 1989 for 1992 activities) be declared formally "inactive". Thematic panels will be given the directive by the JOIDES Office not to review inactive proposals formally, but rather to initiate submission of proposal updates from proponents if there is sufficient panel interest. The community will be informed about this change in policy through the JOIDES Journal.

The following is a summary of the proposal status types assessed by the JOIDES Office:

A proposal is "active" if:

1) it is in review (generally done only once by the thematic panels),
2) it has been ranked by thematic panels,
3) it has not been ranked, but was submitted after January 1, 1988.

A proposal is "inactive" if:

1) it has been replaced by a revised proposal,
2) it has been forwarded to a DPG,
3) it has been drilled, or is on the schedule,
4) it has not been drilled and has not been updated since January 1, 1988 (for calendar year 1991).

In order to keep a proposal active, proponents must submit an update latest after three years since initial submission. The update may be an addendum or a revised version of the proposal. Minimum requirements for an update are responses to thematic panel comments, and an introductionary note identifying the revision or addendum. *Typically, updates also include new site survey data and/or refined drilling strategies.*

It was agreed by PCOM that the new statute of limitations procedure would take effect on *January 1, 1992.* Since SSP attempts to keep track of proposals not yet ranked by thematic panels but reviews only ranked ones, some sorting of the status of long-held proposals was clearly needed and was generally welcomed.

S-proposals: PCOM, at its August meeting in Hannover, decided to abandon the experiment of receiving "Supplemental Science Proposals".

Although only three S-proposals (S-1, S-2, S-3) were received at the JOIDES Office for legs 141 to 147, the enormous difficulties with the concept became obvious when PCOM considered scheduling of supplemental science. In a first step, PCOM had to prioritize S-proposals against each other, and came to the following motion: *"Upon evaluation of the three supplemental science proposals we have received, PCOM ranks the potential science return of S-3 (OSN-2) the highest. Therefore, PCOM will consider only S-3 for scheduling in FY92)."*

In a second step, prioritized S-proposals were judged against science they would replace. This most delicate and complex task could not be completed at the August meeting because further advice from thematic panels was needed. "In order to decide at the Annual Meeting whether to reserve a maximum of 10 days during Leg 145 for drilling a re-entry hole, OSN-2, paired with NW-1A (Supplemental Science Proposal S-3), PCOM asks the thematic panels and co-chiefs for Leg 145 to determine which sites would be modified or dropped to accommodate up to 10 days at OSN-2."

PCOM consequently abandoned the (subtraction) concept of S-proposals and will not issue any call for such proposals for the North Atlantic (1993) and subsequent schedules.

(v) TAMU Meeting: Minutes changes & Matters arising

The minutes of the TAMU meeting were confirmed as an accurate record of SSP activity at that time, although Kidd noted that a consensus item in the main text (dealing with the NAAG-DPG proposals) had not found its way on to the full consensus listing. Discussion ensued on how, within the tight time frame between SSP and PCOM, minutes could be revised if required by members and also how to make sure that SSP members have a copy of the final version. It was agreed that ,should the sequencing of panel meetings be agreed as we suggest, there should still be time (using E-mail and FAX) for updates to the draft before JOIDES Office completes the PCOM Agenda book. On the agreed finalised version of the TAMU Meeting the Chairman will ensure that it is circulated with the draft of the next meeting.

Action Item 3: Kidd will circulate the finalised version of the last SSP meeting minutes with the draft of the present one.

(vi) Updated Ship Schedules (Kidd)

Only the UK ship schedule was available for this meeting and SSP debated the value of continuing the practice of members obtaining these schedules, often with some difficulty, in the light of its current practices. Agreement was reached that the practice should be discontinued.

SSP Consensus 5: Augmentation of Site Survey data packages has rarely taken place through use of "ships of opportunity". Hence SSP members will no longer be asked to provide their country's ship schedules for inclusion in the SSP minutes. However, SSP members are still encouraged to be cognizant of planned ship operations so that they can serve as initial contacts for possible site survey augmentation efforts.

(vii) Other business for Agenda (Kidd)

It was agreed to add an item to allow in Day Three for a discussion of items that Chairman should include in his reports to PCOM and PANCHM at the Annual meeting in Austin.

2. REPORTS:

(i) PCOM (Tiara)

Most PCOM items had been dealt with by this point in Blum's initial presentation. Taira concentrated on two items:

(a) the international effort on ODP renewal (MOU's to be signed October '92). He commented that favourable internal reviews had been reported to NSF by the UK, Germany and ESF; France was in the review process and that in Japan a "critical" review might be expected;

(b) OPCOM activity on Alternate Platforms: noting that the Soviets have a half-built drillship for riser drilling and France have a ship planned with APC capability. Japan's projected riser drilling ship is expected to be independent of ODP.

(ii) JOIDES Office (Blum)

Nothing to add here because of the extended item 1.(iii) above.

(iii) TAMU (Firth)

Cruises update: Leg 137 ended on 1 May 1991 in Panama. The principal objective of the cruise was to recondition Hole 504B for future deepening and downhole measurements; this included completing remedial measures to clean junk for the hole left during Leg 111, and conducting tests to prove the feasibility of continued coring. Before these operations were begun, undisturbed borehole temperatures were logged and seven fluid samples were collected. Cleaning the junk from the bottom of the hole required less than one week of straightforward fishing, milling, and drilling operations. Coring tests with the ODP rotary coring system and a conventional diamond core barrel yielded mixed results, suggesting that future drilling will require trade-offs between penetration and recovery. In total, Hole 504B was deepened by 59.2 m to a total depth of 1621.5 mbsf (1347 m into basement); of this interval 48.6 m was cored, with an overall recovery of 8.77 m. The recovered rocks were all interpreted as a continuation of the sheeted dike complex. Unfortunately, tests with the diamond core barrel were terminated when an outer core barrel with the diamond bit broke off in the hole, and this equipment was not recovered during the leg due to lack of time and appropriate fishing tools. Nevertheless, the general consensus is that the lost equipment can easily be retrieved with proper fishing tools, and probably represents only a minor impediment to future deepening on Leg 140.

Leg 138 sailed from Panama on 5 May, and ended in San Diego on 4 July. The primary objective of the cruise was to define the paleoceanographic evolution of the eastern equatorial Pacific during the last 12 million years. To address this objective, 5536.8 m of core were recovered from 11 sites drilled along two north-south transects (95°W and 110°W) that crossed the complex oceanographic circulation system of the equatorial Pacific. The 5536.8 m of core recovered represented 99.9% recovery of the interval cored, and broke the existing record for total core recovery set on Leg 133.

Leg 139 sailed from San Diego on July 11 and ended in Victoria on Sept. 11. Four sites were occupied in the Middle Valley of the northern Juan De Fuca Ridge, with the overall objective of elucidating processes and products of hydrothermal circulation in a sedimented spreading center. Site 855 drilled four holes (penetration from 63 -119 mbsf) next to a valley-bounding normal fault. All holes intersected basement, 2 in the footwall block, 2 in the hanging wall block. Pore water geochemistry and low heat flow indicate that seawater is being drawn down to basement along the fault. Site 856 drilled 8 holes into and adjacent to a seafloor sulfide deposit, defining the minimum lateral and vertical extent of this deposit. Two RCB holes penetrated down to 65 and 95 mbsf without reaching the base of the massive sulfides. The sulfides probably were formed from precipitation at the seafloor. At Site 857, four holes were drilled (maximum penetration 936 mbsf) to study the hydrogeology of a hydrothermal reaction zone and the structure and composition of a sediment-and-sill complex. The base of the sediment/sill complex was not reached. Site 858 was situated close to a high-temperature, hydrothermal vent site; drilling there included over 100 m of penetration into the upper part of extremely young, igneous crust. Heat flow measurements indicate that fluid flow feeding the vent is very localized.

SSP discussion ensued on the discrepancies on this leg between projected and true depths to the base of the sediment/sill sequence and basement. Clearly some kind of possibly deep towed source geophysics is required to better determine projected drilling times.

<u>SSP Consensus 6</u>: SSP notes the possible discrepancy between observed and estimated basement depths encountered during leg 139. Based on analysis of these results together with experience with future EPR drilling, we will consider at our next meeting making deep source seismic profiles a requirement for any future mid-ocean ridge/fracture zone sites with crustal objectives.

Action Item 4 : TAMU representative (Meyer?) at the Spring'92 SSP meeting is asked to bring for analysis tables of estimated versus drilled depths to basement for Leg 139 and estimated versus drilled thickness of rubble zone on Leg 142

Leg 140 is the cruise currently underway. PCOM gave one week for cleanout of Hole 504B or a decision to move to Hess Deep - this decision is being made about now. It was noted that little information on the Hess Deep drilling appears in the Leg 140 Prospectus. In fact, as far as we are aware no documentation was sent to the Data Bank prior to sailing. These facts caused much consternation and discussion given SSP's recognition at its last meeting that time was so short for the proponent to get his survey package together that he had effectively to bypass SSP and liaise directly with Carl Brenner to have it complete for PPSP and the Prospectus.

<u>SSP Consensus 7</u>: As of our meeting, a decision is expected within the week as to whether the Resolution will drill Hess Deep in the second half of the current leg (Leg 140). No data whatsoever from Hess Deep has been received at the ODP Data Bank, and no substantive data is included in the Leg 140 prospectus. SSP wishes to express its concern and dismay that the system of checks and balances which normally ensures that an adequate data package is available to the ODP community appears to have been circumvented. SSP urgently looks forward to working with proponents on the data package for future Hess Deep drilling.

An updated JOIDES resolution schedule is included here as SSP Appendix 3.

ODP/TAMU has proposed testing the drilling capabilities of the JOIDES Resolution in shallow water by drilling one rotary core site in the lagoon at Enewetak Atoll during either Leg 143 or 144. PCOM endorsed these tests at their April meeting, limiting the duration of the test, including deviation from the proposed tract, to not exceed 60 hours. The prime criteria for the site include: (1) water depth within the range 20-50 m; (2) lithified rock as close as possible to the seafloor; (3) location within the sheltered waters of the lagoon to minimize the effects of swell/sea on dynamic positioning (i.e., the site should not be too close to the channels entering the lagoon); and, (4) away from bomb test sites, because recovery would probably be poor in the shattered rock. ODP is in the process of defining proposed site locations, and hope to present those locations to PPSP at their meeting later this month. (SSP reviewed seismic data for Enewetak later under item 3(iv).)

Firth also commented on shipboard and TAMU staffing, the Annual ODP Co-Chief Review, and the long awaited RFP for real-time navigation on JOIDES 'Resolution'.

(iv) PPSP (Ball)
The Safety Committee is glad to report that Leg 139, sedimented ridge drilling, presented no problems from standpoint of excessive hydrogen sulfide. Leg 142, on the East Pacific Rise, still represents a potential H_2S problem. The planned penetration of bottom simulating reflections on Leg 141, Chile Triple Junction, continues to command the Safety Panel's attention. A preview of the Cascadia leg is scheduled for PPSP's next meeting in late October.

PPSP will meet in San Diego on 24-25 October. They will review the Leg 143 and Leg 144 drillsites, preview the drilling planned on the Cascadia margin during Leg 146, and finalize the draft of the new Safety Manual (to be published as a special issue of the JOIDES Journal).

(v) Data Bank
Carl Brenner did not attend but reported that SSP has reviewed all the data which appear in the safety package for Leg 143/144. The proposed drillsites for Legs 145 and 146 will be reviewed at the PPSP meeting tentatively scheduled for sometime in March 1992.

(vi) DPG's:
The N. Atlantic Gateways DPG has finished its work, the report was published in JOIDES Journal v 17-2 pp 38-50 and is included in the North Atlantic Prospectus. Larsen noted that there may later be some combining of NAAG and NARM proposals.

The North Atlantic Rifted Margins DPG have lodged their final report but PCOM has left it open whether the Group will be asked to meet again.

The Atolls & Guyots DPG is to be disbanded. It was noted that the Enewetak drilling will be included in the prospectus for the two legs and possibly also the S-3 proposal's objectives.

(vii) WG's
The Sea Level Working Group has to date discussed only approaches in its two meetings. No targets are expected until the middle of next year.
The Offset Drilling WG has met once and their preliminary discussions are contained in an executive summary in the N.Atlantic Prospectus. This includes their initial assessment of site survey data types that would be needed and SSP was very interested in their recommendations. SSP wishes to contribute to the Working Group's discussions in this area: thus there was a consensus (no.8) that we should request a liason to the next WG meeting.

SSP Consensus 8/Action Item 5. SSP Chairman (Kidd) should request of PCOM Chairman that an SSP member (Kastens) attend the next meeting of the Offset Drilling WG to contribute to discussions of survey requirements, some of which are as yet unclear to SSP itself.

3. SCHEDULED LEGS - FY'92

(i) Chile Triple Junction (Lewis).........(.input?... Steve - help, can't find this - the following is from my notes >>)
The Leg 141 co-chiefs now do not expect to get to the pre-collision zone or to the northern sites which were not reviewed by PPSP. Ball commented at how smoothly this operationally difficult

drilling proposal had passed PPSP largely due to the hard work of its SSP watchdog, later to become co-chief. Temperatures of 150 to 200°C are now modelled at the base of slope based on BSR depths - SSP will follow with great interest developments on this Leg because of implications for its future review of sites with BSR's.

(ii) East Pacific Rise (Lewis)

The primary objective for Leg 142, East Pacific Rise Engineering, is to maximize coring time using the latest model of the diamond coring system (DCS). A refined version of the mini hard rock guidebase will be deployed in conjunction with the first stage of a new version of the drill-in bottom hole assembly (BHA). Coring with the DCS will continue until the system has demonstrated that it can achieve satisfactory rates of core recovery in the fractured formations of the EPR or until downhole temperatures become too high for the safety of the personnel on the DCS platform. The drilling target is a minimum of 100 m of penetration into fractured basalt with a minimum of 50% recovery.

Site EPR-2 is the primary site chosen for Leg 142 operations. Alternate sites include EPR-1, EPR-1A, EPR-2A, and EPR-3. Diving operations have taken place since our last meeting allowing selection of EPR-2 in a flat sheet lava portion of the axial graben. Recent near-bottom seismic refraction work shows that EPR-2 has about 50-60 m of low-velocity (* 2 km/s) material interpreted to be "rubble", overlying material of approx. 5.5 km/s. Site EPR-1 is the primary back-up site for EPR-2. Both sites are well-characterized by previous site survey investigations but note SSP Action Item 4.

(iii) Atolls & Guyots (Firth)

See earlier discussion in 2(iii) and (iv) and next item.

(iv) Enewetak Test Drilling (Firth)

SSP reviewed the seismic profiles and borehole data for the Enewetak site (Appendix 4, Table 1) and were generally impressed with the data quality. Members commented on the similarity of the seismic sequence with that at Huevo Guyot where the projected sediment-basement contact in the central lagoon is at around 900 M sub-bottom. Here a similar reflector at similar depth has borehole evidence indicating it is within or the base of a sediment-sill sequence and not basement which is not well imaged below.

SSP Consensus 9: SSP are happy to approve the data package presented for the Enewetak test drilling. On the other hand, SSP notes that comparisons of the seismic and borehole evidence here with those over other atolls and guyots projected for basement drilling suggest that possible drilling times to basement need to be very carefully assessed for Legs 143 and 144. SSP recommends a local pre-drilling survey by JOIDES resolution over Huevo Seamount and consideration be given to similar surveys over Alison & MIT if basement objectives prevail.

(v) N. Pacific Neogene (Larsen).

Site PM 1 (Patton Murray Seamount) was approved by SSP at the July 90 meeting. Sites NW-1A and NW-4A were approved at the same meeting. The seismic reflection data are poor but are still judged sufficient for the drilling of paleoceanographic objectives with limited basement penetration by APC/XPC techniques, as long as seismics are run by the drillship on approach and through the sites. The identification of the basement in the currently available data for NW-1A is insufficient for planning the installation of OSN-2.

According to Carl Brenner, the assigned Co-chief, Dave Rea, has picked positions for sites on Detroit Seamount (PCOM 20-22 Aug 91 minutes, app. 12) called DS-1, DS-2, DS-2A and DS-3. Of these DS-1 and DS-3 have basement objectives as well as paleoceanographic objectives. SSP requests that information on the site positions be given to the panel before final SSP approval of the sites. Because of the shifts in positions of these sites from those reported previously in SSP minutes, we recommend new designations for these sites.

SSP Consensus 9: Site survey data is generally sparse and of poor quality for the N. Pacific Neogene Leg 145 site PM1 is already approved. NW-1A and NW-4A are approved as long as local pre-drilling surveys take place with JOIDES resolution. NW-1A under consideration for OSN-2 is currently insufficiently surveyed for basement drilling. Approved sites on Detroit Seamount have been relocated and are being re-examined by SSP watchdog Larsen.

Action Item 6: Larsen to check N. Pacific sites with basement objectives that have been relocated. Kidd to be notified result prior to Austin PCOM Meeting.

(vi) Cascadia (Louden)

All sites as specified by the Cascadia DPG were accepted by SSP at our last meeting, except for Site VI-5 on the Vancouver margin, where it is intended to drill through a BSR sequence. The exact location of this site will be considered by PPSP based on future experience with BSR drilling which is included for the Chile margin. Correcting misinterpretations from our previous meeting, SSP now notes the presence of crossing MCS lines within the region of the proposed drilling area of Site VI-5. Analysis of these data indicate flat lying basement when corrected for velocity variations due to the hydrate. Recent seismic modelling by R. Hyndman and G. Spence suggest a thin 17 m hydrate layer with no requirement for free gas accumulation beneath the hydrate. This result apparently differs from the environment of the Chile margin where phase reversal in MCS data indicate a larger gas accumulation.

Analysis of previous site survey data on the Oregon margin is continuing with preparation of a structural interpretation from the 1989 MCS survey. SeaMarc IA images of high acoustic backscatter correspond with zones of carbonate precipation based on submersible observations, including recent Alvin dives in Sept 1991 near Site OM-7. These conform to indications of fluid migration along fault zones as previously interpreted. GLORIA sidescan images processed by B. Carson will be supplied to the Databank.

SSP Consensus 10: The site survey data for Cascadia drilling is complete and need not be considered further by SSP. Final approval of hydrate drilling falls under the mandate of PPSP.

(vii) Hess Deep

(See discussion for Leg 140 above with SSP Consensus 7.)

SSP TOKYO DAY TWO

4. STATUS OF N. ATLANTIC PROGRAMS

1. Mediterranean Gateway - proposal 323/Rev -- KASTENS --(Kidd proponent)

SSP watchdog Kastens wrote to proponent Comas in May, conveying the results of the spring SSP meeting, at which we concluded "this project has a good start towards satisfying SSP requirements". A critical turning point for this project will be the decision for one leg or two legs. If two legs are allocated, then considerably more data must be provided to evaluate Sectors 4 and 5 in the Alboran Sea, and the site southwest of the Straits of Gibraltar (Appendix 4, Table 2). In either case, additional information will be required for the Gulf of Cadiz sites." Neither the SSP watchdog nor the ODP Data Bank has received any communication from these proponents since then. Kastens has informally received another proposal entitled "Tectonic evolution of the Alboran Sea: A Proposal for ODP Drilling (proponents A. B. Watts and J.P. Platt), which proposes drilling in the same general area as the Alboran portion of the Comas proposal and which, we understand from Blum, is being reviewed by thematic panels. The Watts/Platt proposal includes sites located on high quality MCS data collectd from the R/V Conrad; this data set was not mentioned in the Comas proposal, and would be a valuable addition to the regional data package.

The proponents are urged to begin submitting a data package to the ODP Data Bank. SSP and Safety Panel will expect to see the industry borehole data by which the seismic data have been calibrated; the proponents are thus reminded that data in the Data Bank can be held proprietary. For safety considerations, the proponents will need to fully document their claim (p.22) that Messinian evaporites are not present at their Alboran Sea sites.

SSP Consensus 11: No data has been received at the Data Bank concerning the Alboran Sea or Atlantic-Mediterranean gateway (proposal 323 Rev), but the proposal gives the impression that there is a lot of good quality regional and site specific data in this area that could be gathered together in time for FY'93 drilling.

2. Mediterranean Ridge ("new") - proposal 330- FARRE

The rationale of this proposal: "An Accretionary Prism in a Collisional Context" is to add the Mediterranean Ridge (MR) to a spectrum of accretionary prisms studied by deep sea drilling. Important distinctions for the MR proponents are:
1) MR is underlain by continental crust in incipient collision
2) Salt layer at shallow depth has strong impact on deformation and fluid flow
3) Unique Plio/Quaternary drape contains a high-resolution record of climate change.

Summary of Major Scientific Objectives:

Tectonic: define tectonic style of MR and compare with other accretionary prisms; determine role of salt in deformation mechanics; examine deep structure of mud diapirs.

Sedimentary/Geochemical: influence of salt seal on fluids within MR complex; role + composition of gasses beneath salt seal.

Ocean History: origin/significance of Plio/Quaternary sapropels; pre-Messinian stratigraphy and Paleoceanography.

Strategy:

Drill 2 transects across MR and 2 extra sites for specific targets. Transect MR1-3 crosses the narrowest + most deformed portion of the Ridge. Transect MR4-6 crosses the western portion of MR where continental collision has not yet started. Site MR-7 is along the western portion of the Ridge in an interpreted tensional environment. Site MR-8 is in a salt collapse basin where pre-Messinian seds can be sampled.

Status of Site Survey Data:

A package has not been submitted yet. The proponents plan to submit one by year-end 1991. SSP's matrix for this proposal is currently as in Appendix 4, Table 3.

Recently Collected/Planned Data Collection includes:
- 5 long piston cores
- High-res SCS reflection data in Sept. '91
- MCS survey in 1992 on vessel Explora
- MCS survey in 1992 on vessel Valdivia
- A Hydrosweep survey from vessel "Explora" was mentioned in a Jan. '90 addendum. Presumably, this will occur in 1992.

SSP Consensus 12: For the Mediterranean Ridge Proposal (330), SSP separates the shallow penetration sites (MR-2, MR-6 and MR-7) from the remaining 5 deep penetration sites. With collection of the planned data, SSP sees no problem with assembling a suitable data package for the shallow penetration sites. Successful drilling of the deep penetration sites will require adequate imaging of the Messinian evaporite and pre-Messinian strata in the upcoming 1992 MCS surveys. SSP is concerned that the quality of the MCS data may not be sufficient to image the sub-salt strata and that selection of the deep penetration sites may prove problematic.

000316

3. Equatorial Atlantic Transform Margin - proposal 346/A - PAUTOT

JOIDES Proposal 346 was submitted in summer 1989, evaluated by last spring's Tectonic Panel, and recently (March 91) was complemented by an addendum concerning data processing.

A new version of this proposal was sent to JOIDES Office in early August. This latest version is not greatly modified from previous versions. The most important input concerns the data processing of MCS lines. The following processing has been applied:

- processing has initially been only on the 24 channel data;
- velocity analysis is complete on a 7-8 km average spacing;
- mute, dynamic corrections, equalization;
- stacking;
- no deconvolution or migration have yet been applied.

During winter 91-92, more detailed processing (stacking and migration) will be performed nearby and across the proposed drill sites.

Two cruises have recently recorded a detailed set of refraction data using OBS. Refraction processing has started only recently. This processing will start by filtering the seismic signal (filtering, stack, mute, AGC) in order to construct time/distance sections. The integration of MCS and refraction data will be concentrated near the proposed sites.

Finally, in June 92, dives with "Nautile" are scheduled along various cliffs on the Ivory Coast-Ghana Ridge.

SSP Consensus 13: The data set outlined in the proposal for Equatorial Transform Margin Drilling (346A), and the processing that has been carried out or is scheduled by proponents, should provide a high quality package for SSP assessment. The newly processed data should be deposited in the Data Bank for review at the Spring SSP Meeting. Existing heat flow values or newly gathered measurements would be useful in completing this package but are not deemed critical at this stage.

No matrices have been prepared as yet for the proposal 346A sites.........Guy, can you supply these for the final version of the minutes?...RBK.

SSP also discussed the status of the complementary proposal: "Major oceanographic pathway, Equatorial Atlantic" by E.J.W. Jones. During our last meeting, SSP concluded that the proponents should provide better seismic profiles across and nearby their proposed sites. Pautot wrote to E. Jones in May and received a reply in July.

"We do not yet have any new seismic data to support our proposal but hope to process some data in the next few months when we have access to some funding. I should be very grateful if you would let me know the status of our proposal since this will affect the amount of pressure I can bring to bear on our administration here. I am very anxious that we support the highest priority sites with more seismic data."

This proposal was not considered further during this SSP Meeting because it was not included in the NAP. However, for completeness, our watchdog Pautot will write a letter to the proponents to point out the current ranking of the proposal.

4. New Jersey Margin Sealevel - proposal 348 + 348/A - KASTENS

Since the spring SSP meeting, the proponents for this program have submitted a revised drilling proposal, which has sites located along new MCS and single channel seismic lines collected from the R/V *Ewing* in 1990 (sites in the preliminary proposal were located on 1970's vintage industry seismic lines). The scientific objectives and drilling strategy have not changed in the new proposal. The proposed drilling plan has three sites in water shallower than 35m; it is suggested that these would be drilled by a commercial jack-up rig. The shallowest site proposed to be drilled by the *Resolution* would be in 51m water depth. The proponents must provide information on water current velocities in the vicinity of these shallow water (shelf) sites.

The quality of the *Ewing* seismic data is excellent, and the survey track forms a tight grid of dip and strike lines with numerous track crossings (Appendix 4: Table 4). To date, one of the *Ewing* MCS lines, the northernmost dip line in the grid, has been processed. The sites in the current drilling proposal are along this processed line, which was one of the few records examined by SSP at this meeting. Unfortunately, this particular line crosses a structural high, a Cretaceous-age igneous intrusion called the "Great Stone Dome," which may cause safety problems. The Great Stone Dome is of limited north-south extent, and the proponents feel that it will be possible to find sites on one of the more southerly *Ewing* MCS lines which both meet the drilling objectives and avoid the Dome. Standard processing of the other MCS lines is in progress, and should be finished in plenty of time to plan for a drilling leg in the 1993 time frame. High-quality seismic processing of these data will be important for both pre-drilling site selection and for post-drilling interpretation of drilling results. We urge the proponents to undertake both post-stack time migration tests and pre-stack depth migration tests in order to assess the benefits of high-level processing for this important data set.

SSP Consensus 14: The data collected for the New Jersey Sea Level Mid-Atlantic Transect (proposal 348-ADD) is of excellent quality and sufficient quantity. SSP notes that seismic processing of high quality would benefit greatly both pre-drilling site selection and post-drilling scientific interpretation, and recommends proponents to pursue this goal in the interests of maximising the return from the surveys and potential drilling.

5. TAG Area: High-temperature Hydrothermalism - proposal 361/Rev -- LOUDEN -- (von Herzen proponent)

.......input?- Keith, I can only find the matrices- the following is from my notes - please modify -most important is to get the consensus right.

This proposal calls for bare rock drilling at up to 4 locations on the TAG area of the Mid-Atlantic Ridge in around 3700m water depth (Appendix 4: Table 5). Sites PRI-A,B,&C; PRI-2; PRI-3 and PRI-4 envisage penetrations of between 300m and 1km and will certainly require the DCS system. Some of the data required by SSP guidelines exists, none is presently in the Data Bank and there is an obvious need for significant amounts of site survey data. Seismics and heat flow data is more critical at this stage than rock coring but we suspect that this will also become a requierement and more bottom photography may also be needed. The Panel would expect these proponents to develop a site survey package to the level of that collected together for the Sedimented Ridges drilling and they should consider including the placing of marker transponders in any plans for further site specific surveys.

SSP Consensus 15: The bare rock drilling proposed for the TAG area (proposal 361Rev), with penetrations envisaged ranging from 300 to 1km, will require a site survey package rivaling that for the Sedimented Ridges. SSP recognises the existence of a great deal of TAG data that could be lodged with the Data Bank but notes the obvious need for further seismic data (all "required/not available") along with heat flow, further photography and sampling and deep-towed magnetics.

As a matter of discussion SSP diverted to consider appropriate surveys for hydrothermal drilling. Von Herzen commented that one of the primary objectives of surveys for hydrothermal drilling is to characterize the fluid porosity and permeability in as much detail as possible. In addition to near-bottom seismics, electrical methods may also provide useful information because electrical conductivity is a well-understood proxy for porosity, which in turn may be related to permeability. Electrical sounding experiments may utilize either direct or fluctuating current methods, and in all cases should be carried out as close as possible to the seafloor for maximum resolution. For small scale (~ m to 10^2m) surveys, a well-navigated submersible is probably required for precise positioning of the instrumentation. The Panel expects to return to electrical sounding methods in its deliberations of updates to its guidelines next meeting.

6. VICAP Gran Canaria - 380 (Rev) + Rev 2 - von HERZEN

A preliminary site survey data package should be compiled for SSP to accompany the VICAP proposal. From the proposal in the present prospectus, SSP is concerned as to the adequacy of the deep seismic (MCS) data for the purposes of identifying oceanic basement, and for showing lithosphere deformation. SSP is also concerned that the anticipated GLORIA survey data will not resolve regions of sediment slumping on longer time scales, which may result in localized hiatuses. Much more extensive high quality MCS and high resolution SCS data may be required to optimize drill hole location and achieve a complete composite section of the apron (Appendix 4, Table 6). The relevant commercial MCS data noted in the proposal should be incorporated in the data package for SSP. The MAP-1 (abyssal plain) reference site was not discussed by SSP as it was considered a late 'add-on' from another proposal which is currently under review by thematic panels and the Sea-level Working Group.

SSP Consensus 16: SSP requests that a preliminary site survey data package be assembled for VICAP as early as possible. The Panel is concerned that the quoted MCS data may not be currently adequate to address objectives relating to basement and lithospheric deformation. Commercial MCS data referred to in the proposal might allay these concerns. The GLORIA survey planned to identify areas of sediment slumping will not address early slumping phases in the development of the apron and again extensive high resolution MCS and SCS will be a requirement.

7. Ceara Rise - proposal 388 - H. MEYER

Eight proposed drill sites on the eastern flank of the Ceara Rise address questions of Neogene paleoceanographic significance in the equatorial Atlantic. Objectives call for the last 10 ma. of undisturbed sediments being penetrated with the APC/XCB, in water depths of between 2800m and 4500m.

The original proposal has an inadequate site survey data set and no matrix has been prepared here. A U.S. site survey is planned, however, and is funded for mid '92. The survey will include high-resolution single channel seismics with Hydrosweep multibeam bathymetry, 3.5 kHz and 12 kHz echo sounding, 20 long sediment core stations and wide angle reflection and refraction seismics.

SSP Consensus 17: Although no adequate survey package yet exists to support the Ceara Rise proposal (388), a funded U.S. cruise proposes to carry out an optimal combination of geophysical techniques and thus the likelihood is that a complete data set will be available to support this shallow APC/XCB drilling.

8. Mediterranean Sapropels - proposal 391 -- KIDD

Kidd summarised the proposal for APC recovery of the Mediterranean sapropels that is rising high in the SGPP rankings although it is still a 'concept proposal' at this stage. No specific sites are as yet proposed but the proponents feel this is an easy exercise given the geophysical coring and detailed survey areas that already exist in the Eastern Mediterranean. Clearly some of the objectives might be teamed with the Mediterranean Ridge proposal (330). It was noted that the proponents had suggested APC recovery at the existing DSDP sites 374, 375/376 and 377, while it is known that many of the sapropel layers in the basin sites are resedimented 'sapropelic turbidites' which are unlikely to serve the purposes of the proponents' approach.

SSP Consensus 18: No specific sites are proposed in this "concept" proposal so SSP finds it difficult to comment on this proposal; other than to note the proponent's suggestions that their objectives might be incorporated in the Mediterranean Ridge proposal (330) or in the APC coring at existing DSDP sites.

9. NAAG-DPG: Arctic Gateways - proposals 305, 320, 336 - LARSEN

SSP's evaluation of the NAAG site survey status is based on the data as presented in the proposals 305, 320 and 336 and a letter from E. Jansen 23.9.91 on subsequently-collected site survey data. Only part of the NAAG-DPG's programme is likely to get drilled in FY'93. In order to keep the program flexible enough to respond to the changing ice conditions, it is important that both the prime drilling sites mentioned in the DPG report as well as alternate sites meet the SSP requirements. We expect to be able to review the bulk of the relevant NAAG survey data at our spring meeting.

1) The YERMAC and FRAM Strait sites.

The data seem in general to be sufficient, however, high frequency processing for better definition of the sequence to be drilled is desirable. The occurence of coarse ice-rafted debris at or near the seafloor should be evaluated.

2) The East Greenland Margin Sites

The positions of Sites Green 1 and Green 2 are not yet fixed. Site survey data will be collected by R/V "*Hakon Mosby*" in the summer of 1992, provided normal ice conditions exist in the area. EGM 1-4. - in general the data is probably adequate. EGM 1 and EGM 2 should possibly be moved to crossing seismic lines nearby. EGM 4 a crossing seismic line along the slope of the fan is needed and seismics with better resolution are required for safety considerations and in order to detect slides and other disturbances in the sequence. The seismic data illustrated in the proposals are very low frequency so details of importance for the planning and interpretation of the upper sedimentary sequence are not visible. Processing for better resolution is highly desirable. Heat flow data may be needed if BSR's are detected at any of the sites.

3) The Greenland Norway Transect.

Sites ICEP 1-4. and IP 2: according to E.Jansen new seismic data have been collected and processed. These data are probably sufficient to meet SSP's guidelines but they still need to be examined in detail.

4) The Southern Gateway

Site NIFR 1, north of the ridge: data probably is sufficient to meet SSP guidelines. SIFR 1 and the Denmark Strait sites: locations have not been pinpointed no data is presented in the NAP however it is likely that sufficient data exists from these areas.

NAAG matrices appear as Appendix 4-Table 7

SSP Consensus 19: None of the seismic data for the North Atlantic-Arctic Gateway (NAAG) Program are in the ODP Data Bank and proponents are urged to begin sending their material soon. In order to keep the program flexible enough to respond to the changing ice conditions, it is important that both the prime drilling sites mentioned in the DPG report as well as alternate sites meet the SSP requirements. Additional site survey data, which will be collected in 1992, must be processed and ready for assesment as early as possible. In general, seismic data illustrated in the proposals are very low frequency so details of importance for the planning and interpretation of drilling results are not visible. Higher frequency processing or collection of high resolution SCS will be required. Data on frequency and size of ice-rafted debris should be compiled in order to select proper drilling methods. Sidescan coverage should be able to provide some indications of seafloor dropstone concentrations.

10. North Atlantic Rifted Margins-DPG: - volcanic - proposals 392-396; non-volcanic - proposals 334, 365; Rev Galicia Margin 334 & GB-Iberia plume volc. proposal 363 ----- LEWIS -- (Louden & Kidd proponents on original proposals)

The NARM-DPG's programme contains a great deal of drilling, only some of which is likely to be considered for FY'93. SSP considered at length the DPG's site objectives in their distilled programme but will be unable to review actual data until its spring meeting.

The overall drilling objective here is to "describe and understand upper crust to upper mantle igneous and deformation processes related to continental breakup, and in turn how they relate to deeper mantle processes and dynamics".

Implementation:

Priority 1: "Carry out drilling-supported transect studies across selected margins, including conjugate pairs which show strongly contrasting modes of continental breakup and encompass much of the variability in this process". Two end-member styles of continental breakup are:

1) multiple rift, non-volcanic, wide zone of continental crustal thinning margin, and
2) single rift, crustal thickening, highly volcanic with thick volcanic/igneous crustal accretion during breakup and early spreading.

Since the question of asymmetry in rifted margin development has been recognized, it is necessary to carry out conjugate margin studies. Drilling both volcanic margin pairs is of lower priority because seismic studies suggest strong symmetry for this type of rifted margin. In contrast, non-volcanic margins seem to develop asymmetrically, and hence require conjugate drilling. Basement sampling is of high priority for both types of rifted margin. Sediment-starved regions have been selected for achieving deep drilling objectives. Sampling of high-priority deep targets will require penetration in the 3-5 km range, and is considered a very high-priority long-term objective; a pilot site for such deep objectives is included in this proposal.

Transect Options:

The NARM-DPG considered a number of possible North Atlantic margin studies (see proposal list). The options evaluated include:

1) Newfoundland Basin/Iberia Abyssal Plain conjugate margins
2) North Flemish Cap/Goban Spur conjugate margins
3) Labrador/SW Greenland conjugate margins
4) SE Greenland/Rockall-Hatton Bank conjugate margins
5) NE Greenland/Vøring Plateau conjugate margins.

The Newfoundland Basin/Iberia Abyssal Plain and North Flemish Cap/Goban Spur transects were considered for non-volcanic margins drilling, and the SE Greenland/Rockall-Hatton bank and NE Greenland/Vøring Plateau transects were considered for volcanic margin drilling. The Labrador Sea transect bears on both volcanic and non-volcanic margin formation.

The top priority transects selected by the NARM-DPG are:

1) Newfoundland Basin/Iberia Abyssal Plain transect (non-volcanic),

2) SE Greenland/Rockall-Hatton Bank transect (volcanic),
3) Vøring margin/SE Greenland transect (volcanic).

Volcanic Margin Transect Drilling-Strategy:

The three transects are located in different positions relative to the Iceland hotspot, and, together with onshore continental flood basalt data and previous DSDP/ODP drilling from the southern Rockall and Vøring margins, will allow mapping of the general location and shape of the underlying hot spot/mantle plume during rifting and breakup.

Southeast Greenland Transect at 63° N - "EG 63"

This four-site transect is located along the 61° N flowline (61° N at the Reykjanes Ridge) in one of the simplest known volcanic margin settings characterized by seaward-dipping reflector sequences (SDRS). Drilling on this transect is intended to constrain the SDRS emplacement mechanism, temporal development of the volcanism, vertical and horizontal crustal accretion rates, chemical composition and variation across the SDRS zone. Site EG63-1 will sample the initial volcanism, which is likely to show large variations with stratigraphic level. Sites EG63-2 and EG63-4 will sample the central part of the excessive volcanic phase in an area of interpreted steady state wedge formation, where it is seismically well imaged. Site EG63-2 is planned as a deep basement site in order to recover more rift-proximal deposits, cyclicities, and lava stratigraphy. Site EG63-3 will sample the phase of waning volcanism and increased subsidence at about C24/C23, and is planned as a shallow basement well. Sites EG63-12, and 3 will provide a complete margin subsidence profile across a margin showing simple topography.

Vøring Margin Transect - "VM"

This transect is built on ODP Site 642, with an addition of three more sites. ODP site survey data in this transect is known to be good. The primary objectives are to determine the timing of volcanism with respect to rifting and breakup, the temporal patterns of volcanism, possible margin asymmetry, and the lateral variation in vertical motion of the SDRS. Plans include using existing and future industry wells on the shelf and upper slope to augment the landwardmost portion of the transect.

ODP Site 642, which was drilled through the innermost part of a seaward dipping reflector wedge during Leg 104, forms a key element of the transect. Three more sites, VM-3, VM-5, and VM-6 are proposed. Site VM-3 is located on the outer part of the same (main) seaward dipping reflector sequence as Site 642, with the goal of sampling the younger part of the volcanic wedge in order to complete the geochemical characterization of the wedge, and to constrain the timing of the transient excessive volcanism at this margin segment. Site VM-3 is planned as a deep basement site for correlation with seismic data, to provide access to more rift-proximal deposits, and to increase stratigraphic coverage. Site VM-5 is located on the outer part of a second and slightly younger (anomaly 23/22) seaward dipping reflector sequence exhibiting a different style of renewed dipping reflections. This younger wedge is north of a small margin transform fault separating the two wedges, and drilling into this wedge will test geochemical and constructional differences across the margin. Site VM-6 is a reference hole sampling basement in an area of interpreted normal oceanic crust. The site will be located within the flow sector through VM-3 and VM-5 on crust of anomaly 23/21 age. The VM sites will provide important subsidence data on a structurally more complex margin, and together with industry data from the shelf provide a complete margin transect.

Southeast Greenland Transect at 66° N - "EG66"

This two-site transect lies between the 63° N and the original Iceland plume center. This transect is located along the 63° N flowline, and hence is related to the DSDP Leg 49 transect drilled across the Reykjanes Ridge. Site EG66-1 will sample, with deep basement penetration, the initial volcanism and rift environment, and provide stratigraphic data for correlation with nearby CFBs. Site EG66-2 will sample excessive volcanism close to its apparent termination about C22, and provide stratigraphic data for correlation with Leg 49 sites as well as serve as a reference to the similarly aged "young" dipping reflector wedge on the Voring Margin.

Non-Volcanic Margin Drilling Strategy:

Conjugate rifted margins often display pronounced asymmetry in structural style. Often, a broad zone of attenuated continental crust has as a conjugate a sharp transition between unthinned continental crust and oceanic crust. The degree of asymmetry is likely related to the mode of lithospheric deformation during rifting (i.e pure shear or simple shear). One of the best means of determining whether rifting took place symmetrically or asymmetrically is to understand the subsidence history of conjugate rift zones. The amounts of syn- and post-rift subsidence constrain the amounts of crustal thinning relative to the entire lithosphere, and hence can indicate the degree of symmetry of this process.

An additional drilling objective is to define the geological properties of the ocean-continent transition (OCT). Geophysical observations have proven to be less than definitive in defining this fundamental lithospheric discontinuity, and the relatively thin overlying rock units of some non-volcanic margins allow the OCT to be drilled.

The NARM-DPG proposes to drill a conjugate margin transect within a single geophysically-defined rift segment that includes the North Newfoundland Basin and the Iberia Abyssal Plain (IAP). They also propose a single additional site on the Galicia Bank, one segment north of the IAP.

The sites in the Newfoundland Basin, NB-1, NB-4A and NB-7A, span the zone of thin crust that has been variously identified as oceanic and thin continental. Site NB-l is located at the landward side of the thin crustal zone and would provide information about pre-breakup setting, timing of rifting and breakup in the basin, and vertical position of the crust, before, during, and after rifting. Site NB-4 is located roughly in the center of the zone of thin crust. and would sample post-rift sediment, the breakup unconformity, syn-rift sediment, and basement. Basement samples should resolve the question of the character, oceanic or continental, of the thin crust. Data from the sediment will constrain timing of rifting and breakup, and vertical movements of the crust. Site NB-7A is located on a basement ridge just landward of the J-Anomaly ridge, both of which are thought to be oceanic. If NB-7A is oceanic and the zone of thin crust is continental, this will date the oldest oceanic crust along the transect. If continental, the drilling will have precisely bracketed the OCT between this ridge and the J Anomaly ridge. Possible drilling surprises could include drilling a serpentinized peridotite ridge similar to that on Galicia Bank and thought to continue southward into the Iberia Abyssal Plain, conjugate to the Newfoundland basin.

The sites proposed for drilling in the Iberia Abyssal Plain, IAP-l, IAP-2, IAP-3, IAP-3B, IAP-4, and IAP-5, are concentrated in the middle and outer parts of the zone of thin crust, and fall into two groupings. The first group, sites, IAP-2, IAP-3, IAP-3B, IAP-4, and IAP-5, are part of a strategy, to locate the OCT in the Iberia Abyssal Plain, to determine the extent of peridotite exposure in the basement, and to constrain the subsidence history of the margin. The first site, IAP-4, would sample the geophysically identified peridotite ridge. Drilling would follow at site W-2, landward of IAP-4, to sample the last, tilted continental block. In the absence of major surprises, it is proposed to proceed to site IAP-3B, just oceanward of site IAP-4, to drill what is interpreted to be the oldest oceanic crust. Our objective is to define the OCT, constrain vertical movements of the crust, and understand the geochemistry of the early volcanism. If peridotite is not encountered in IAP-4, it is proposed to step either landward, if oceanic material were recovered, or oceanward, if continental material were recovered. Two sites landward of IAP-4 (IAP-5 and IAP-2), and two sites oceanward of IAP-4 (IAP-3B and IAP-3) may be used in this strategy. The second group of sites, actually one site, IAP- 1, is located over the wide zone of transitional crust analogous to that in the Newfoundland Basin. The site would probably require <u>an entire leg to drill</u> through post-rift sediment, the breakup unconformity, syn-rift sediment, and basement.

NARM-DPG also proposes drilling one site in Galicia Bank, GAL-l, which may lead to an exciting drilling opportunity. The "S" reflector in the Galicia Bank is interpreted to be a low-angle detachment fault penetrating to at least mid-crustal depths. The proposed site, GAL-l, lies where a reflector thought to be correlatable to "S" is shallow enough to drill.

NARM matrices appear as Appendix 4-Table 8

<u>SSP Consensus 20</u>: North Atlantic Rifted Margins
The data illustrations included in the NARM-DPG chapter of the North Atlantic Prospectus suggest that existing data for the four proposed transects are adequate for site selection, despite SSP's inability to carefully evaluate overall data quality from page-size presentations. Proponents involved in future site survey data acquisition (7/92, Newfoundland Basin; Fall 1991, Iberia Abyssal Plain; 1992 and 1993, East Greenland) should consult with SSP and PPSP watchdogs for specific site survey and safety concerns. SSP anticipates evaluating data packages of scheduled NARM drilling programs at its Spring'92 meeting.

11. MARK area: long section of upper mantle (MAR Offset Drilling) - proposal 369, 369/Rev, 369/A -- HIRATA -- (Kasten's proponent on survey proposal)

There already exists a considerable site survey data package for the MARK area (Appendix 4- Table 9). However we note that there are no transverse MCS lines, which run through the proposed sites. There was much discussion of the lack of understanding of the deeper structure and the reasons for the uplifted target fault block. We consider that the data are presently

insufficient for the objectives posed but expect that the additional site surveys, including the planned sidescan sonar cruise, will do much to update the data. Deep source seismic surveys may be prove to be desirable when SSP revises its guidelines.

SSP Consensus 21: There already exists a considerable site survey data package for the MARK area proposal (369A) but SSP notes that there are no transverse MCS lines which run through the proposed sites. We consider that the data are not yet sufficient for the objectives posed. Some attempt to understand the deep structure should be part of the survey stage, in particular, the reason for the existence of the uplifted target block should be addressed. SSP expects that the additional site surveys, including the planned sidescan sonar cruise, will do much to update the database. Deep source seismic surveys may prove to be desirable when SSP revises its guidelines.

12. Vema FZ: proposal 376/Rev - VON HERZEN

A preliminary site survey data package should be compiled for the Vema Fracture Zone proposal for detailed discussion at SSP's Spring 1992 meeting. All relevant existing data (Appendix 4 - Table 10) should be submitted to the Data Bank at LDGO (C. Brenner). SSP notes that some critical data types would be needed to reliably achieve the stated objectives of this proposal:

1) Seismic data with near-bottom source and (for seismic tomography) OBS experiments to determine velocities and structure over at least the uppermost 1 km at the drill sites that are planned for 0.5-1.0 km penetration ;

2) deep-towed sidescan data. The latter is scheduled to be obtained on a future cruise, although at a rather late date (FY 93) for the Atlantic drilling phase.

SSP Consensus 22: SSP considers that a reasonable site survey package could be gathered in support of the Vema FZ proposal (376 Rev) should planned survey cruises take place. A preliminary package should be submitted to the Data Bank for appraisal at SSP's Spring meeting. We note that critical sidescan surveys are not scheduled to take place until 1993 to complement the existing MCS and refraction data. SSP recommends additional collection of deep source seismics and OBS data.

SSP TOKYO DAY THREE

OTHER PROPOSALS:

The Panel had agreed [in 1(i) and 1(iii)] not to discuss the following proposal items during this meeting :

13. Barbados Accretionary Wedge - proposals 378/A & 372/A -- KIDD
14. West Florida Margin Sea Level - proposal 345/A -- MOORE
15. Caribbean Crust - proposal 343 -- FARRE
16. Cayman Trough - proposal 333 - KIDD

7. OTHER BUSINESS

(i) Revised watchdog assignments (Kidd)

Revised assignments for this meeting were dealt with in consensus item 1 at the beginning of the meeting and involved continuing members Farre and von Herzen. It is noted that because of member retirements discussed in (iv) below assignments will have to be revised for our Spring meeting. In paerticular we would expect Karl Hinz replacing Heinrich Meyer to take on his Ceara Rise watchdog role.

Action Item 7: Hinz to assume H.Meyer's watchdog role for Ceara Rise proposal 388

(ii) Feedback to Proponents (Blum)

The appropriate SSP feedback mechanisms were discussed with Blum at this stage and it was agreed that:

Action Item 8: SSP watchdogs should not contact proponents with news of SSP Tokyo assessments until it is known which of the NAP proposals were selected by PCOM for the FY'93 schedule. It should be stressed to these proponents that they should submit all available data relating to their proposals to the Data Bank for assessment prior to and during the next SSP meeting in April '92.

Discussion ensued on the likely effects of PCOM's scheduling at the Austin meeting. A number of members expressed the view that some of the more exciting and enticing drilling proposals were poorly supported by survey data and there would be pressure on PCOM to schedule them. In turn SSP might be pressured to "rubber-stamp" survey deficient proposals These concerns resulted in the following:

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SSP Consensus 24/Action Item 9: Kidd to relay to PCOM a request that, should they schedule drilling in FY'93 that is clearly dependent on the collection of further site survey data, PCOM should define a back-up alternate leg to take place in the event that the surveys are not completed. This is to put responsibility and pressure to deliver on proponents. SSP would in turn discuss cruise plans and required data processing, liase closely with proponents and possibly meet more frequently in abbreviated session to view data with proponents.

(iii) PANCHM/PCOM Report

Members were asked to nominate items of concern that should be relayed by Kidd in his SSP Reports to the Deccember Annual Meetings in Austin. Those included were:

- Offset drilling strategy and appropriate surveys;
- PCOM action on S-proposals;
- Current responsive mode does not allow for detailed assessment of site survey packages.
- How does SSP avoid conflict once proposals are on the schedule?
- PCOM motion on data submittal for each scheduled leg.
- SSP's membership procedures - see below.

(iv) Panel Membership (Kidd)

Kidd explained that this discussion of the Panel's membership was in response to a request for clarification from the JOIDES Office. There was a general recognition in JOIDES that Service. Panel's might not have the same fixed rotation as thematic panels because continuity and the retention of expertise can be paramount. Nevertheless, non-US partner countries often have fixed terms of rotation and in many cases alternates waiting in the wings could bring valuable new expertise to the Panel (as for RBK himself!). After some discussion we agreed on the following to put to PCOM:

SSP Consensus 24: SSP recommends to PCOM that the term of membership of its Panel date from first attendance and that terms for SSP members be 4 years rather than 3 to allow for the full progression of a set of proposals during their stewardship.

A review of the expertise of the current membership indicated that all of the techniques of our newest guidelines are each covered by at least two members (A. Trehu brings further refraction expertise when she begins her term). We recognise, however, that envisaged updates to the guidelines may mean we will need to recruit expertise in deep source seismics and deeply towed electrical and magnetic sounding techniques.

Turning to the periods of membership of the current SSP some are due to rotate off even given a four-year term:

Kidd 3 years extension on taking up Chair ends after Sept'92 meeting;

Lewis 4 years at Sept'92, will rotate off (note major watchdog portfolio for NARM);

Larsen 4 years but requested by ESF to extend to Sept'92;

Farre 6 months only;

Kastens 1.5 years;

Pautot 1 year;

Hirata 1.5 years;

Louden 3.5 years runs to Apr'92

Meyer H. 4 years at Sept'92, will rotate off and expected replacement is K.Hinz;

von Herzen 1.5 years;

Moore 1 year

Trehu term not yet begun;

Zverev term not yet begun.

SSP Consensus 25 : Steve Lewis of USGS, Menlo Park and Heinrich Meyer of BGR, Hannover retire from the Panel after this meeting as part of SSP's review of its membership. The Panel expresses its thanks to Steve and Heinrich for their hard work as long-standing SSP members. Steve is recognised as a particularly tenacious "watchdog" whose activity will be sorely missed. SSP wishes him the best of luck as co-chief for the Chile TJ drilling.

The Panel discussed likely US replacements for Steve Lewis who would cover his particular MCS seismics expertise and Kidd has two names to relate to PCOM Chair Austin. They have a strong preference for one of these because of the onerous task of potentially taking over Steve's NARM role.

We went on to consider the Chairmanship since Kidd noted that his commitment to a term of at least 3 years as Chairman ends after the Autumn'92 meeting and he has an excellent UK alternate (Sinha) in waiting who currently never gets to attend. Members were asked to consider taking up the Chair and discussion was deferred to the Spring'92 meeting.

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(v) Next meeting

The prime aim of the Spring '92 SSP meeting will be to advise PCOM on the status of scheduled FY'93 legs (and alternates?) after a thorough assessment of submitted data. Although initially it was considered that it was the turn of the USA to host SSP has actually run ahead of its normal 2 meetings in USA versus 1 in a partner country. Also there were competing claims as to whether we could view most data in the US or Europe. Birger Larsen offered to host at the Denmark Geological Survey where much of the NAAG data could be viewed by that time. Clearly we are hoping that much of the data would have been submitted to the Data Bank and copies out to Watchdogs and we still have to be concerned over Carl Brenner's ease of travel at that time.

It was agreed that Kidd should request the next SSP meeting in Copenhagen hosted by Larsen at the Denmark Geological Survey spanning the dates 2nd, 3rd and 4th April 1992 (Action Item 11). We should stand prepared to change the venue to the LDGO Data Bank should the prognosis on Carl at the end of January favour the move.

. Chairman warmly thanked our hosts at ORI for their hospitality and great help during the meeting. Naoshi Hirata is thanked for all his efforts in arranging our travel and accommodation. The Tokyo SSP meeting was formally closed at 1430 on 10th, October, 1991

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SSP TOKYO : APPENDICES

Appendix 1. Highly Ranked Atlantic and Adjacent Sea Proposals, Oct 1991.

Appendix 2. New JOIDES Proposal Submission Guidelines.

Appendix 3. Updated ODP Operations Schedule.

Appendix 4. SSP Matrices as of Tokyo Oct '91 Meeting:

- Table 1: Matrix for Enewetak Site.
- Table 2: Alboran Sea (323 Rev) Matrix.
- Table 3: Mediterranean Ridge (330) Matrix.
- Table 4: New Jersey Margin (348A) Matrix.
- Table 5: TAG Area (361 Rev) Matrix.
- Table 6: VICAP (380 Rev) Matrix.
- Table 7: NAAG DPG Matrices.
- Table 8: NARM DPG Matrices.
- Table 9: MARK Area (369A).
- Table 10: VEMA FZ (376 Rev).

SSP TOKYO APPENDIX 1.

Highly Ranked Atlantic and Adjacent Seas Proposals, Oct. 1991

Compiled by the JOIDES Office for the Site Survey Panel Meeting in Tokyo, Oct. 8-10, 1991

Sorted into two *Atlantic and adjacent seas* priority groups:
1. Ten programs included in the North Atlantic Prospectus, September 1991
2. Other proposals that were within the first 5 "Atlantic ranks" in April 1991

1. Programs included in North Atlantic Prospectus, September 1991 (proposals are within the first 7 global ranks of April 1991)

Proposal	Received	Abreviated Title	Contact	SSP assignment
*323 and	02/11/91	Alboran basin and Atlantic-Mediterranean gateway	Comas, M.C.	K. Kastens
*330	07/17/89	Accretionary prism and collision, Mediterranean Ridge	Cita-Sironi, M.B.	T. Farre
*346	08/14/89	Drilling equatorial Atlantic transform margin	Mascle, J.	G. Pautot
*348	08/16/89	Paleogene/Neogene stratigraphy, U.S. Atlanic margin	Miller, K.G.	K. Kastens
*361	01/03/90	Active hydroth. system, slow-spread ridge, MAR 26° N	Thompson, G.	K. Louden
*380	05/01/90	Volcanic island - clastic apron, Gran Canaria	Schmincke, H.U.	R. von Herzen
*388	10/01/90	Neogene deep water circ. and chemistry, Ceara Rise	Curry, W.B.	H. Meyer
*391	01/02/91	Formation of sapropels, eastern Mediterranean	Zahn, R.	R. Kidd
*NAAG	02/20/91	North Atlantic - Arctic gateways DPG Report	Ruddiman, W.F.	K. Birger Larsen
*NARM	09/10/91	North Atlantic rifted margins DPG Report	Larsen, H.C.	S. Lewis
*OD-WG	09/09/91	Offset Drilling WG Preliminary Report, incl. proposals 369&376	Vine, F. - MARK - VEMA	N. Hirata D. Von Herzen

* See North Atlantic Prospectus for details on most recent updates

2. Other proposals that were within the first 5 "Atlantic ranks" (first 9 global ranks) in April 1991

059-Rev2	09/21/88	Cont. margin sed. instability, drilling adjacent turbidites	Weaver, P.P.E.	
343----	08/08/89	Window of Cret. volcanic formation, Caribbean Zone	Mauffret, A.	J. Farre
339---- and	08/11/89	Paleoceanographic transects, Benguela Current	Meyers, P.A.	
354----	10/04/89	Late Cenozoic upwelling system, Angola/Namibia	Wefer, G.	
347----	08/15/89	L. Cenozoic paleoceanography, south-equatorial Atlantic	Wefer, G.	J. Farre
378-Rev	03/12/90	Growth and fluids evol., Barbados accretionary wedge	Westbrook, G.K.	R. Kidd

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SSP APPENDIX 2.

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JOIDES Proposal Submission Guidelines

Revised June 1991

Introduction

The purpose of the JOIDES scientific advisory structure is to formulate the most productive ocean drilling plan which will answer scientific questions about present-day and past processes of the earth. Drilling is based on proposals from the entire earth science community.

The Planning Committee (PCOM) monitors and directs the proposal review process, reviews recommendations made by advisory panels, decides the fate of proposals, sets ship tracks, and schedules drilling legs in two continuous and interrelated planning phases: setting a general four-year ship track based on highly-ranked proposals, and detailed scheduling two years in advance based on further thematic panel prioritization of the four-year plan, maturity of existing programs, and logistical considerations. PCOM depends primarily on its four thematic panels for advice on scientific objectives. Detailed Planning Groups (DPGs) may also be formed and mandated by PCOM to help thematic panels translate broad thematic programs and highly ranked proposals into concrete, prioritized drilling plans. The service panels, the Science Operator (TAMU: Texas A&M University), Wireline Logging Services (LDGO: Lamont-Doherty Geological Observatory), and Site Survey Data Bank (LDGO) also provide advice on optimum, safe drill sites. Figure 1 is a flow chart of the proposal review process.

According to previous proposal submission guidelines, JOIDES accepted both *Preliminary Proposals* and *Mature Drilling Proposals* into the planning process. Such a distinction depends on the definition of proposal "maturity", a complex issue that has to be continuously evaluated by the JOIDES advisory structure (based on panel mandates, thematic panel white papers, site survey and safety guidelines) rather than by proponents. In fact, most proposals are preliminary at the time they are submitted; only continued effort by proponents interacting with JOIDES leads to finalized drilling plans.

For this reason, JOIDES now only accepts ***drilling proposals*** (see below) that include a comprehensive outline of thematic objectives and drilling strategies, information on site survey data, and meet certain editorial requirements (see below) in order to be accepted into the formal review process. If a proposal is accepted by the JOIDES Office, proponent(s) will receive copies of thematic panel reviews within six months.

If a proposal is not complete as defined above, but contains ideas or prospects for such a follow-up document, it is accepted by the JOIDES Office as a ***Letter of Intent***, which is then forwarded to thematic panels for information but <u>not</u> for procedural review. Response by thematic panels to authors of letters of intent is optional, but encouraged by the JOIDES Office.

Requirements for a drilling proposal

ODP proposals must be submitted to the JOIDES Office, which rotates every two years among the ten JOI institutions. An ODP drilling proposal has to meet the following requirements in order to be accepted and forwarded to the four thematic panels by the JOIDES Office:

Years before drilling	Review/Planning Procedures	Action of JOIDES advisory structure
2-?	Review of all incoming proposals; proponents are sent a completed review form from each panel within about six months after submission to the JOIDES Office.	Thematic panels at spring and fall meetings
2-?	Global ranking of all "active" proposals; relative rank of a proposal/program may change at subsequent meetings; theoretically, new, exciting and complete proposals along the general ship track may get onto the drilling schedule within the same year, and get drilled two years after submission	Thematic panels at early spring meetings
2-4	General ship track determined, based on thematically highly-ranked proposals/programs, with relatively firm early track (<2 years) and relatively flexible later direction (>2 years); refined at subsequent meetings based on reevaluation of panel recommendations, technological developments, and overall state of the ODP program	PCOM at spring meeting
	Merging of proposals or formation of Detailed Planning Groups (DPGs) may be recommended by thematic panels and approved by PCOM	Thematic panels PCOM
	Preliminary site survey data assessment and specific recommendations for highly ranked proposals/programs	SSP
	Preliminary safety review of highly ranked proposals/programs	PPSP
	Thematic prioritization of previously highly ranked proposals/programs	Thematic panels at fall meetings
1-2	Proposals/programs get on schedule based on thematic prioritization, and consideration of logistics, site survey status, technological developments, and balance of general ODP themes.	PCOM at Annual Meeting (Nov/Dec)
	Monitoring of scheduled proposals/programs	PCOM
	Preparations for drilling (staffing, equipment)	Science Operator
0.5	Final safety review	PPSP
	Final approval, if necessary, after PPSP changes	PCOM
0	Program/proposal is drilled	

Figure 1. Approximate time table for JOIDES review and planning procedure

Thematic

- Scientific objectives must be outlined, and preferably linked to COSOD or ODP Long Range Plan (LRP) themes. (These documents are available from JOI, Inc. in Washington, D.C.)
- Drilling strategies must be tied to stated scientific objectives.
- Choice of sites must be supported by site-specific objectives within the framework of the stated drilling strategy.

Site-specific

- Proposed sites must be given a site name, latitude and longitude, water depth, proposed total penetration depth and site-specific objectives. For each proposed site, a site summary form (SSF, Figure 2) must be included. In some cases, a general transect, or reference to scheduled sites of other proposals, may suffice.
- Information on existing or in-progress site survey data, with reference to site survey standards (see "site survey review" below), must be provided. (The Site Survey Data Bank at LDGO may assist.)
- Statement of known potential safety (see "safety review" below) and other (i.e., weather, physical oceanographic conditions, territorial jurisdiction, etc.) problems must be included.

Editorial

- A proposal must include an abstract of less than 400 words. Ideally, a copy of the abstract should also be sent to the JOIDES Office via electronic mail or on floppy disc (if possible: Macintosh).
- A short (not more than 150 words), comprehensive list of scientific objectives should be included in the proposal (and included with abstract on Email/floppy).
- Ten copies of the entire proposal must be submitted to the JOIDES Office.

Deadlines for proposal submission

Drilling proposals can be submitted at any time of year to the JOIDES Office. Thematic panels review proposals twice a year, once around March and once around October. In the past, proposals have often been submitted during the period when panels meet, adversely affecting proposal-handling in the JOIDES Office and proper review by panel members prior to meetings. The JOIDES Office will therefore only forward proposals to panels which are received not later than two weeks before the first of the thematic panel meetings of either the fall or spring review period. Meeting dates are published in the *JOIDES Journal* well in advance, and exact dates are also updated frequently on the telemail (Omnet) "drilling" bulletin board. As a general rule, submit proposals not later than January for spring reviews and August for fall reviews. Proposals submitted directly to thematic panels are not reviewed. Proposals received after the stated deadlines will be forwarded by the JOIDES Office to thematic panels for their next meetings.

Thematic review

Proposals submitted to the JOIDES Office are logged if proposal submission requirements outlined above are met. Proponents will then receive an acknowledgement. The JOIDES Office forwards complete proposals to each of the four thematic panels for review. Although it is unlikely that all panels have interest in any specific proposal, all thematic panels are requested to review all proposals in order to maintain a fair, proposal-generated and thematically

ODP Site Summary Form 6/91

Fill out one form for each proposed site and attach to proposal

Title of Proposal:	
Site-specific Objective(s) (List of general objectives must be inc. in proposal)	

	Proposed Site	Alternate Site
Site Name:		
Area:		
Lat./Long.:		
Water Depth:		
Sed. Thickness:		
Total penetration:		

	Sediments	Basement
Penetration:		
Lithology(ies):		

Coring (check): 1-2-3-APC VPC* XCB MDCB* PCS RCB DCS* Re-entry

Downhole measurements:

*Systems currently under development

Target(s) (see Proposal Submission Guidelines): A B C D E F G (check)

Site Survey Information (see Proposal Submission Guidelines for details and requirements):

		Check	Details of available data and data that is still to be collected
01	SCS deep penetration		
02	SCS High Resolution		
03	MCS and velocity		
04	Seismic grid		
05	Refraction		
06	3.5 or 12 kHz		
07	Swath bathymetry		
08	H.-res side-looking sonar		
09	Photography/video		
10	Heat flow		
11	Magnetics/gravity		
12	Coring		
13	Rock sampling		
14	Current meter		
15	Other		

Weather, Ice, Surface Currents:

Territorial Jurisdiction:

Other Remarks:

	Name/Address	Phone/FAX/Email
Contact Proponent:		

controlled drilling program. Informational copies of proposals are sent to JOI, Inc. in Washington, D.C., the Science Operator at TAMU, and the Site Survey Data Bank at LDGO.

Thematic evaluations are based on individual panel mandates, COSOD white papers, the LRP, and the experience and judgement of panel members. Proposal reviews are summarized in panel meeting minutes and on Proposal Review Forms (PRF, Figure 3). Each panel returns a completed PRF for each proposal to the JOIDES Office. The JOIDES Office then forwards PRFs to proponents. PRF comments may include suggestions on how to enhance strength of a proposal (in which case a *revised proposal* is expected), or may request additional information (in which case *addenda* may be submitted). Panels may also suggest merging similar or related proposals into one drilling program (i.e., incorporating proposals of limited scope into thematically or regionally related proposals of broader scope), or they may discourage proponents from pursuing a proposal with no prospect of being drilled within the present ODP. Thematic panels may also propose formation of Detailed Planning Groups (DPGs) to PCOM, with specific mandates to prioritize a drilling program incorporating two or more highly-ranked proposals.

Global ranking of proposals

Each spring, the thematic panels prioritize all available proposals they consider within their mandate. Global rankings are published in the (June) *JOIDES Journal*.The JOIDES Office summarizes these global rankings and PCOM sets a general four-year ship track based on these global priorities, with relatively firm early track (<2 years) and relatively flexible later direction (>2 years). The ship track is further refined at subsequent PCOM meetings, based on reevaluation of panel recommendations, technological developments, and overall state of the ODP program. On the one hand, complete and scientifically exciting proposals theoretically can become a top priority within one year, and could be drilled within two years after submission. On the other hand, relatively highly-ranked proposals may not get onto the drilling schedule at all, or stay on a waiting list, because final prioritization by thematic panels and scheduling by PCOM must take into account other criteria, such as technological feasibility and balance of major ODP themes.

Site survey review for highly ranked proposals

Proposals prioritized by thematic panels as being highly ranked are monitored by the Site Survey Panel (SSP). The time required for a thematically prioritized proposal to become part of a drilling plan depends to a large degree on completeness of required site survey data. Proponents are therefore urged to submit as complete a data package as possible as early as possible, once their proposals are highly ranked. If survey data is still to be collected, the timing of cruises, firmness of funding, and period required for data processing before submission to the Data Bank should all be noted.

Site survey data standards

SSP review is based on identification of drilling target categories and site survey techniques that can provide the optimal data set for each target. The target/techniques table used by SSP members monitoring proposals is shown in Figure 4.

ODP Proposal Review Form

Proposal received at the JOIDES Office: 00/00/00

000330

Title:

Proponent(s):

Evaluation by: ☐ LITHP ☐ OHP ☐ SGPP ☐ TECP

For panel mandates, Long Range Plan themes, and reference to other relevant papers, see back page.
For site survey requirements, see Proposal Submission Guidelines (JOIDES Journal, June 1991).
For safety guidelines see JOIDES Journal special issue referenced on the back page.

1. Proposal objectives are not within the mandate of this panel (as listed on back).
2. Does not address high-priority thematic objectives (as detailed in Long Range Plan).
3. Is of secondary interest to this panel if it is of high priority to some other panel.
4. Addresses high-priority objectives, but with deficiencies, as noted below.
5. Addresses high-priority objectives of this panel.

Comments if within mandate of this panel (points 2-5):

Date returned to: JOIDES Office
Institute for Geophysics
University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759

Contact proponent:

Target categories describe broad types of drilling objectives. Individual sites with multiple objectives may be required to meet the standards of two target categories. For example, sites frequently have shallow APC objectives (target A) and deeper sedimentary or basement objectives (target D or E). The Site Survey Panel member monitoring a proposal ("watchdog") will inform proponent(s) of the target category of each proposed site:

Target A: Generally APC/XCB penetration.
Target B: Greater penetration than a few hundred meters on a passive margin.
Target C: Greater penetration than a few hundred meters on an accretionary wedge, fore-arc, or sheared margin.
Target D: Greater penetration than a few hundred meters on oceanic crust. Often includes basement penetration.
Target E: Sediment thicknesses of less than a few hundred meters on oceanic crust
Target F: Bare rock drilling, e.g., ridge crest, fracture zone ridge.
Target G: Elevated features with widely varying sediment thicknesses, e.g., seamount, fracture zone ridge, plateau. Sediment slumping may be a problem on flanks. Basement is often an objective.

All geophysical techniques are not appropriate for all sites, and specific combinations are chosen to get maximum useful information for minimum cost. Figure 4 shows site survey requirements for each target environment.

1. Deep penetration SCS: large sound source-single channel seismic.
2. High resolution SCS: watergun single-channel seismic (or small chamber airgun in some situations).
3. MCS and velocity determination: velocity determination (stacking velocity and semblance plots) when accurate depths are critical; velocity analysis to determine sediment thickness over proposed sites.
4. Grid of intersecting seismic lines: required density of seismic grid and/or crossing lines over proposed site depends on each particular situation.
5. Refraction: sonobuoy or OBS refraction profiles; expanding spread or wide-angle refraction profiles; near-bottom sources and receivers may be desirable for highest resolution.
6. 3.5 or 12 kHz: to resolve small-scale sea floor morphological features and type of bottom material.
7. Swath bathymetry: as from a multi-narrow-beam echo sounder or an interferometric side-looking sonar system; required for all bare-rock drilling sites; may be required for any site with steep or complex topography; areas where slumping may occur should have swath bathymetry and/or side-looking sonar data.
8. High resolution side looking sonar: imagery-acoustical reflectivity from towed sonar devices is needed on fans and in topographically complex terrains; areas where slumping may occur should have multibeam bathymetry and/or side-looking sonar.
9. Video or still seafloor photography: visual imagery from towed vehicle or submersible is needed to site bare rock guidebase, and may be desirable to understand the tectonic or volcanic setting of some drill sites
10. Heat flow: pogo-type profiles or piston core heat flow measurements in detail, with *in-situ* thermal conductivity for highest accuracy, as appropriate to the scientific problem.
11. Magnetics and gravity: regional magnetics if magnetic age of crust is important; gravity for subsidence studies; SEASAT data may complement regional magnetic picture.

		DRILLING ENVIRONMENT (TARGET)						
	DATA TYPE	A Paleoenvironment or Fan (APC/XCB)	B Passive Margin	C Active Margin	D Open Oceanic Crust (>400m Sediment Cover)	E Open Oceanic Crust (<400m Sediment Cover)	F Bare-rock Drilling	G Topographically Elevated Feature
1	Deep Penetration SCS	(X)	(X)	(X)	X or 3			(X)*
2	High Resolution SCS	X	(X)	(X)*	(X)	X	X	X
3	MCS & Velocity Determination		X	X	X or 1		(X)*	(X)*
4	Grid of Intersecting Seismic Lines	(X)*	X	X	(X)*	(X)	(X)	(X)*
5	Refraction		(X)*	(X)*	(X)*	(X)	(X)*	(X)*
6	3.5 kHz or 12 kHz	X	X	X	X	X	X	X
7	Swath Bathymetry	(X)*	(X)*	X or 8	(X)	(X)*	X	(X)*
8	High Resolution Side-looking Sonar	(X)*	(X)*	X or 7			(X)*	(X)*
9	Photography or Video			(X)			X	(X)*
10	Heat Flow		(X)*	(X)*		(X), H	(X), H	
11	Magnetics & Gravity		(X)	(X)	(X)*	(X)*	(X)*	(X)
12	Cores: Paleoenvironmental/geotechnical	X	(X), R	(X), R	R	R, H	X	(X)*, R
13	Rock Sampling					(X)*	X	(X)*
14	Current Meter (for Bottom Shear)	(X)*	(X)*	(X)*			(X)*	(X)*

X = Vital
(X) = Desirable
(X)* = Desirable, but may be required in some cases
R = Vital for re-entry sites
H = Required for high temperature environments

Figure 4. Drilling target categories versus site survey techniques.

000331

12. Coring: near paleoenvironmental sites. All re-entry sites should be supported by cores, core description and geotechnical measurements (contact Science Operator at TAMU for geotechnical requirements).
13. Rock sampling: dredging, submersible sampling, and/or rock coring may be required when basement drilling is included in the objectives.
14. Current meters: information on bottom currents will be required when bottom shear might be a problem. Shallow water sites may need tidal current information as well.

Physical Oceanographic Conditions

Information on ice, weather and near-surface currents, which might have a serious impact on the viability of a drill site, is also required at this stage. Information on ice conditions must be provided with high-latitude proposals, and on near-surface currents for some continental margin locations.

Data Deposition

Supporting data for proposals must be deposited in the ODP Site Survey Data Bank to ensure that a proposal stays viable. Data may be deposited in stages, while informing the Data Bank on data still to be collected. Guidelines for submission of data to the Site Survey Data Bank are detailed in the *JOIDES Journal Special Issue, Vol. XIV, No. 4, 1988* (p. 49).

Safety review

The most critical safety and pollution hazards in scientific ocean drilling are possible release of hydrocarbons from a subsurface reservoir or penetration into a superheated hydrothermal system. The presence of gas hydrates or high concentrations of H_2S in pore waters may also sometimes constitute a hazard. In most deep-sea regions, the risk of hydrocarbon release can be reduced or eliminated by careful planning, judicious choice of drilling locations based on proper site surveys, and by taking special precautions when coring at potentially hazardous sites.

Although primary responsibility for documenting hazardous sub-seafloor conditions rests with the co-chief scientists, proponents can ensure at an early stage that adequate technical data are obtained and processed for examination by the Pollution Prevention and Safety Panel (PPSP) by becoming familiar with guidelines for safety reviews.

Safety review is a critical element in the process of planning a drilling leg. In addition to the PPSP, the Science Operator at TAMU also has an independent group of safety advisors. Advice and recommendations from both groups are incorporated into the final decision by the Science Operator on whether or not a proposed site will be drilled. PPSP guidelines are detailed in the *JOIDES Journal Special Issue, Vol. XIV, No. 4, 1988* (p. 33); they are being updated this year and will be published in an upcoming special issue of the *JOIDES Journal*.

Other information for preparation of detailed drilling plan

Preliminary Time Estimates for Coring and Logging Operations

Guidelines have been prepared by both the Science Operator and the Wireline Logging Services Contractor for estimating ODP coring and logging times. TAMU has compiled and revised curves for estimating these times in the following publication:

Preliminary Time Estimates for Coring Operations, ODP Technical Note No. 1 (Revised December 1986; available from ODP/TAMU).

In this publication, drill string and wireline trip time curves reflect actual operating times on ODP Legs 103 through 108 (excluding Leg 106, which was not considered representative of routine operations). Curves for drill string trip time and rotary (RCB), advanced piston (APC), and extended core barrel (XCB) coring cycles are included. They can be used for estimating times in both single-bit and re-entry holes.

These curves, along with procedures for calculating approximate coring and logging times, are available to assist proponents in developing realistic drilling times. Whenever possible, time estimates for ODP holes should be based on data from similar locations and/or lithologies.

Because of the complexity of ODP operations, however, these estimates should not be used for detailed operational planning. Once a site has been approved and its objectives defined, detailed planning becomes the responsibility of the Science Operator.

List of publications relevant to proposal submission, and where to get them

- Proposal submission guidelines: JOIDES Office
- COSOD II Report: JOI, Inc.
- ODP Long Range Plan: JOI, Inc.
- Thematic panel mandates: *JOIDES Journal Special Issue, Vol. XIV, No. 4, 1988*; JOI, Inc.
- Thematic panel white papers: various *JOIDES Journal* issues (1989/90), JOI, Inc. or JOIDES Office
- Guidelines for submission of data to the Site Survey Data Bank: *JOIDES Journal Special Issue, Vol. XIV, No. 4, 1988*; JOI, Inc.
- Guidelines for safety review: *JOIDES Journal Special Issue, Vol. XIV, No. 4, 1988*; JOI, Inc.
- Preliminary Time Estimates for Coring Operations: *ODP Technical Note No. 1*; ODP/TAMU

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SSP APPENDIX 4: TABLE 1

Enewetak Test Drill Site

Site Survey Data Summary:			
SITE			
Latitude: Longitude:	~ 11° 24' N ~ 162° 18'E		
Environment:	Topographically climated feature (lagoon)		
Water Depth: Sed. Thickness: Penetration:	~ 50 m > 100 m 100-150 m		
TECHNIQUE			
1. High-res.SCS			
2. Deep pen SCS	No		
3. MCS+Vel.	USGS 405V2 USGS 407V1		
4. Seismic Grid	No crossing line		
5. Seis. Refrac.	No		
6. 3.5 KHz	No		
7. Multibeam Bathymetry	Yes		
8. High-res. Imagery	No		
9. Heat Flow	No		
10. Mag & Grav.	No		

SSP APPENDIX 3

3

ODP OPERATIONS SCHEDULE

Leg		Cruise Dates	Days at Sea	In Port
135	Lau Basin	22 December 1990 - 28 February 1991	68	Honolulu, 28 Feb-02 Mar 91
136	OSN-1	03 March - 20 March 1991	17	Honolulu 20 Mar 91 (Scientific Party Change)
137	Hole 504B	21 March - 01 May 1991	41	Panama 01-05 May 91
138	E. Equatorial Pacific	06 May - 05 July 1991	60	San Diego 05-09 July 91
139	Sedimented Ridges I	10 July - 11 September 1991	63	Victoria 11-15 Sept 91
140	504B*/Hess Deep	16 September - 12 November 1991	57	Panama 12-16 Nov 91
141	Chile Triple Junction	17 November 1991 - 13 January 1992	57	Valparaiso 13-17 Jan 92
142	Engineering, EPR	18 January - 19 March 1992	61	Honolulu 19-23 Mar 92
143	Atolls & Guyots A	24 March - 20 May 1992	56	Majuro Atoll 20-24 May 92
144	Atolls & Guyots B	25 May - 20 July 1992	56	Yokohama 20-24 July 92
145	North Pacific Transect	25 July - 21 September 1992	59	Victoria 21-25 Sept 92
146	Cascadia	26 September - 21 November 1992	56	San Diego 21-25 Nov 92
147	Engineering, EPR†/ Hess Deep	26 November 1992 - 21 January 1993	56	Panama Into the Atlantic

*If cleaning operations successful on Leg 137

†If DCS Phase III System Ready

JLJ

Revised 17 April 1991

11. Paleo cores Geotech cores	Yes USGS F1 - on Elugelab Island USGS E1 - on Medren Island USGS K1B - on Eugebi Island		
12. Dredging	Yes		
13. Current Meter	1-2 kts from East Channel 1 kt from South Channel		

NOTE: This is a preliminary assessment based on the proposal. No data has been submitted to the ODP Data Bank.

Alboran Sea

SSP APPENDIX 4 Table 2 Oct 91

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Proposal 323 Rev

Site Survey Data Summary:			
SITE	Al-1	Al-1A	Al-1B
Latitude: Longitude:	36°12.3'N 04° 24.5'W	36° 17.5'N 04° 09.1'W	36° 11.7'N 04° 25.7'W
Environment: Water Depth: Sed. Thickness: Penetration:	B: passive margin 1036 >3000m 3000m	passive margin 850m >3000m <2200m	passive margin 925m 1100m 1200m
TECHNIQUE			
1. High-res.SCS	yes *	yes *	yes *
2. Deep pen. SCS	yes *	yes *	yes *
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	yes	yes
5. Seis. Refrac.	?	?	?
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no ***	no ***	no ***
8. High-res. Imagery	no **	no **	no **
9. Heat Flow	? **	? **	? **
10. Mag & Grav.	yes	yes	yes
11. Paleo cores Geotech cores	?	?	?
12. Dredging	?	?	?
13. Current Meter	?	?	?

*** Multibeam bathymetry cruise is proposed for 1992 R/V Atalante according to proposal

* Abundant SCS data exists in this area. It is not clear from the information in the proposal whether this is high-res or deep-pen SCS.

** SAR & heat flow work are planned for late 1991 [illegible] according to proposal

The proposal. No data has been submitted to the ODP Data Bank. Alboran Sea

SSP. APPENDIX 4 Table 2 Oct '91

Proposal 323Rev

Site Survey Data Summary:			
SITE	Al-1	Al-1A	Al-1B
Latitude: Longitude:	36°12.3'N 04°24.5'W	36°17.5'N 04°09.1'W	36°11.7'N 04°25.7'W
Environment: Water Depth: Sed. Thickness: Penetration:	B: passive margin 1036 >3000m 3000m	passive margin 850m >3000m <2200m	passive margin 925m 1100m 1200m
TECHNIQUE			
1. High-res.SCS	yes *	yes *	yes *
2. Deep pen SCS	yes *	yes *	yes *
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	yes	yes
5. Seis. Refrac.	?	?	?
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no ***	no ***	no ***
8. High-res. Imagery	no **	no **	no **
9. Heat Flow	? **	? **	? **
10. Mag & Grav.	yes	yes	yes
11. Paleo cores Geotech cores	?	?	?
12. Dredging	?	?	?
13. Current Meter	?	?	?

*** Multibeam bathymetry cruise is proposed for 1992 R/V Atalante according to proposal

* Abundant SCS data exists in this area. It is not clear from the information in the proposal whether this is high-res or deep pen SCS.

** SAR & heat flow work are planned for late 1991 R/V Garcia del Cid, according to proposal

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Alboran Sea p2

Site Survey Data Summary:			
SITE	Al-1B	Al-2	Al-2A
Latitude: Longitude:	36° 11.7'N 04° 25.7'W	35° 43.5'N 03° 12.3'W	36° 10.8'N 02° 44.6'W
Environment: Water Depth: Sed. Thickness: Penetration:	passive margin 925m 1100m 1200m	passive margin 836m >2500m 1500m	passive margin 1773m >2000m 1300m
TECHNIQUE			
1. High-res.SCS	yes *	yes *	yes *
2. Deep pen SCS	yes *	yes *	yes *
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	no	no
5. Seis. Refrac.	?	?	?
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no ***	no ***	no ***
8. High-res. Imagery	no **	no **	no **
9. Heat Flow	? **	? **	? **
10. Mag & Grav.	yes	yes	yes
11. Paleo cores Geotech cores	?	?	?
12. Dredging	?	?	?
13. Current Meter	?	?	?

*, **, *** see notes on Alboran Sea p.1

0003385

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Alboran Sea p 3

Site Survey Data Summary:			
SITE	AL-3	GC-1	GC-1A
Latitude: Longitude:	36° 11.5'N 05° 08.7'W	36° 42'N 7°19'W	36° 24'N 6° 47'W
Environment: Water Depth: Sed. Thickness: Penetration:	~~518m~~ passive margin 518m 5300m 1400m	passive margin 550m 600m 600m	passive margin 350m ? >500m
TECHNIQUE			
1. High-res.SCS	yes*	yes	yes
2. Deep pen SCS	yes*	?	?
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	?	?
5. Seis. Refrac.	?	?	?
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no **	no	no
8. High-res. Imagery	no **	Deep Tow SLS	Deep Tow SLS
9. Heat Flow	?**	?	?
10. Mag & Grav.	yes	magnetics	magnetics
11. Paleo cores Geotech cores	?	yes	yes
12. Dredging	?	?	?
13. Current Meter	?	?	?

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Alboran Sea p 4

000336

Site Survey Data Summary:			
SITE	GC-2	GC-2A	GC-3
Latitude: Longitude:	36°21'N 7° 13'W	36° 22'N 6° 51'W	36° 15'N 7° 03'W
Environment: Water Depth: Sed. Thickness: Penetration:	passive margin 570m ? >500m	passive margin 453m ? >500m	passive margin 760m ? >500m
TECHNIQUE			
1. High-res.SCS	yes	yes	yes
2. Deep pen SCS	?	?	?
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	?	?	?
5. Seis. Refrac.	?	?	?
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no	no	no
8. High-res. Imagery	Deep Tow SLS	Deep Tow SLS	Deep Tow SLS
9. Heat Flow	?	?	?
10. Mag & Grav.	magnetics	magnetics	magnetics
11. Paleo cores Geotech cores	yes	yes	yes
12. Dredging	~~yes~~ ?	?	?
13. Current Meter	?	?	?

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Alboran Sea p5

Site Survey Data Summary:			
SITE	GC-3A		
Latitude: Longitude:	36° 19'N 6° 56'W		
Environment: Water Depth: Sed. Thickness: Penetration:	passive margin 500m ? > 500m		
TECHNIQUE			
1. High-res.SCS	yes		
2. Deep pen SCS	?		
3. MCS+Vel.	yes		
4. Seismic Grid	?		
5. Seis. Refrac.	?		
6. 3.5 KHz	yes		
7. Multibeam Bathymetry	no		
8. High-res. Imagery	DeepTow SCS		
9. Heat Flow	?		
10. Mag & Grav.	magnetics		
11. Paleo cores Geotech cores	? yes		
12. Dredging	?		
13. Current Meter	?		

SSP Appendix 4 Table

Mediterranean Ridge (33?)

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Site Survey Data Summary:			
SITE	MR-1	MR-2	MR-3
Latitude: Longitude:	33°51'N 25°00'E	33°45'N 24°45'E	32°50'N 24°36'E not def chosen yet
Environment: Water Depth: Sed. Thickness: Penetration	Active Margin (ridge crest) 2200m Several km 1000	Active Margin (diapir) 1900m Several km 200m	Active Margin (flank) 2600m Several km 1000m
TECHNIQUE			
1. High-res.SCS	some exists more planned(?) Sept.'91	some exists more planned(?) Sept.'91	none, planned '91
2. Deep pen SCS			
3. MCS + Vel.	2 planned project in 1992	planned '92	planned '92
4. Seismic Grid	2 planned project in 1992 no track charts	planned	planned
5. Seis. Refrac.	?	?	?
6. 3.5KHzor 12KHz	2 planned programs ?	planned ?	planned ?
7. Multibeam Bathymetry	mentioned in Jan.'90 for future but not mentionedagain some seabeam exists	? seabeam ?	? seabeam ?
8. High-res. Imagery			
9. Photography			
10. Heat Flow	Regional	Regional	Regional
11. Mag & Grav.	Regional	Regional	Regional
12. Paleo cores Geotech cores	5 new cores July'91 general area no spec locs	Available	some available Locations ?
13. Dredging			
14. Current Meter	no mention	?	?
	Ridge Crest Loc. Penetrate Messinean evap. Study post Mess. paleoceanography and Pre-Messinean deformation and fluid flow	Mud Diapir: Study of enplacement	Fuid circulation, deformational stress in Pre-Messinean seds.

000337

OCT 91

Site survey Data Summary:			
SITE	MR-4	MR-5	MR-6
Latitude: Longitude:	34°07'N 19°32'E	34°18'N 19°53'E	34°37.5'N 20°25.8"
Environment: Water Depth: Sed. Thickness: Penetration:	Active margin - def. edge 3,900 Several km 2,000	Active margin (flank,crust+front) 3,200 Several km 1000m	Active margin. Crest re-ocupy DSDP125 2780 several km 150m
TECHNIQUE			
1. High-res. SCS	some exit - Conrad'65 more in Sept'91	Conrad'65 more Sept'91	Conrad'65 more Sept'91
2. Deep pen SCS			
3. MCS+Vel.	MS-33 reprocessed	MS-33	MS-33
4. Seismic Grid	2 planned projects in '92	planned '92	planned '92
5. Seis. Refrac.	?	?	?
6. 3.5 kHz	2 planned projects ?	?	?
7. Multibeam Bathymetry	mentioned in Jan '90 document. not mentioned again.SEABEAM?	SEABEAM?	SEABEAM?
8. High-res. Imagery	-	-	-
Photograph			
9. Heat Flow	Regional	Regional	Regional
10. Mag & Grav.	?	?	?
11. Paleo cores Geotech cores	some available no spec loc?	some available loc?	Loc?
12. Dredging	-	-	-
13. Current Meter	?	?	?
	At def. front. Salt may be 1 km thick. Need to penetrate salt study def + fluids.	Def. pattern+fluid circ. seismic shows flat Messiniar refl. and a landward-dipping reflection.	Re-ocupy DSDP125 on crest + sample complete post-Messinian pelagic cover for fluid circ. + paleoceanogarphy studies.
	S -------> transect -------> N		

OCT 91

000338

Site Survey Data Summary:			
SITE	MR-7	MR-8	
Latitude: Longitude:	35°59.6'N 20°00.9'E	35°51.5'N 20°51.5'E	
Environment: Water Depth: Sed. Thickness: Penetration	Active Margin Flank of MR 3100m Several km 150m	Active Margin, Collapse 3100m Several km 1000m	
TECHNIQUE			
1. High-res.SCS	Conrad '65 lines Leg 42 A (1975) more in Sept.'91?	Sept.'91 program?	
2. Deep pen SCS			
3. MCS + Vel.	MS-33	planned	
4. Seismic Grid	2 planned projectt	2 planned project	
5. Seis. Refrac.	?	?	
6. 3.5KHzor 12KHz	Meteor 1966, '91, Sonne '84	should be available W/Deep Tow	
7. Multibeam Bathymetry	mentioned in Jan.'90 not mentioned again seabeam	? seabeam ?	
8. High-res. Imagery		Deep-tow 1978	
9. Photography		probably	
10. Heat Flow	Regional	Regional	
11. Mag.& Grav.	Regional	Regional	
12. Paleo cores Geotech cores	some available need spec. Locs	Good coverage	
13. Dredging			
14. Current Meter	?	?	
	Extensional Env: Stress, Fluid Circ., hist of saplopels + volcanic activity (transpressional env.)	Aphrodite Crader: Deformation and fluid circulation in pre Messinian Side	

[illegible] APPENDIX 4, TABLE 4
OCT '91

New Jersey margin ([illegible])

Site Survey Data Summary:			
SITE	MAT-1	MAT-2	MAT-3
Latitude: Longitude:	39° 37.60'N 73° 36.52'N	39° 33.84'N 73° 29.62'W	39° 31.15'N 73° 24.66'W
Environment: Water Depth: Sed. Thickness: Penetration:	passive margin 29m ? ~7Km 647m	passive margin 31m ? ~7Km 778m	passive margin 31m ? ~7km 960m
TECHNIQUE			
1. High-res.SCS	no	no	no
2. Deep pen SCS	no	no	no
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	yes	yes
5. Seis. Refrac.	no	no	no
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no	no	no
8. High-res. Imagery	no	no	no
9. Heat Flow	no	no	no
10. Mag & Grav.	no	no	no
11. Paleo cores Geotech cores	no	no	no
12. Dredging	no	no	no
13. Current Meter	?	?	?

OCT '91

New Jersey Margin p2

Site Survey Data Summary:			
SITE	MAT-4	MAT-5	MAT-6
Latitude: Longitude:	39° 24.44'N 73° 12.60'W	39° 22.37'N 13° 8.83'W	39° 20.18'N 73° 5.08'W
Environment: Water Depth: Sed. Thickness: Penetration:	passive margin 51m ? ~10Km 745m	passive margin 60m ~10Km 1202m	passive margin 60m ~10Km 868m
TECHNIQUE			
1. High-res.SCS	no	no	no
2. Deep pen SCS	no	no	no
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	yes	yes
5. Seis. Refrac.	no	no	no
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no	no	no
8. High-res. Imagery	no	no	no
9. Heat Flow	no	no	no
10. Mag & Grav.	no	no	no
11. Paleo cores Geotech cores	no	no	no
12. Dredging	no	no	no
13. Current Meter	?	?	?

000339

OCT 91

New Jersey margin p3

Site Survey Data Summary:			
SITE	MAT-7	MAT-8	MAT-9
Latitude: Longitude:	39° 18.15'N 73° 2.17'W	39° 13.01'N 72° 53.04'W	39° 21.34'N 72° 42.59'W
Environment: Water Depth: Sed. Thickness: Penetration:	passive margin 63 m ~10 Km 484 m	passive margin 77 m ~15 Km 1067 m	passive margin 90 m ~15 Km 1031 m
TECHNIQUE			
1. High-res.SCS	no	no	no
2. Deep pen SCS	no	no	no
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	yes	yes
5. Seis. Refrac.	no	no	no
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	no	no	no
8. High-res. Imagery	no	no	no
9. Heat Flow	no	no	no
10. Mag & Grav.	no	no	no
11. Paleo cores Geotech cores	no	no	no
12. Dredging	no	no	no
13. Current Meter	~~yes~~ ?	?	?

OCT 91

New Jersey margin p4

Site Survey Data Summary:			
SITE	MAT-10	MAT-11	MAT-12
Latitude: Longitude:	38° 55.73'N 72° 46.05'W	38° 56.22'N 72° 49.00'W	38° 50.00'N 72° 45.98'W
Environment: Water Depth: Sed. Thickness: Penetration:	passive margin 806 m ~10 Km 908 m	passive margin 430 m ~10 Km 914 m	passive margin 1278 m ~10 Km 477 m
TECHNIQUE			
1. High-res.SCS	yes	yes	yes
2. Deep pen SCS	yes	yes	yes
3. MCS+Vel.	yes	yes	yes
4. Seismic Grid	yes	yes	yes
5. Seis. Refrac.	no	no	no
6. 3.5 KHz	yes	yes	yes
7. Multibeam Bathymetry	yes	yes	yes
8. High-res. Imagery	yes; SCS & submersible	yes; SCS & submersible	yes
9. Heat Flow	no	no	no
10. Mag & Grav.	no	no	no
11. Paleo cores Geotech cores	yes	yes	yes
12. Dredging	yes	yes	yes
13. Current Meter	?	?	?

000340

TAG. (LOUDEN)

TAG AREA (361 REV)

DSI APPENDIX 4 TABLE 5
OCT '91

Site Survey Data Summary:			
SITE	PRI 1A	PRI 1B	PRI 1C
Latitude: **Longitude:**	26° 08' N 44° 49' W	26° 08' N 44° 49' W	26° 08' N 44° 49' W
Environment: **Water Depth:** **Sed. Thickness:** **Penetration:**	MAR- Bare Rock 3700 m 0.1–0.5 m 300 m	MAR-Bare Rock 3700 0.1- 0.5 300	MAR- Bare Rock 3700 0.1– 0.5 300
TECHNIQUE			
1. High-res.SCS	Not Available Required		
2. Deep pen SCS	Not Available Desirable		
3. MCS+Vel.	Not Available Desirable		
4. Seismic Grid	Not Available Desirable		
5. Seis. Refrac.	Not Available Desirable		
6. 3.5 KHz	Not Available Required		
7. Multibeam Bathymetry	Yes		Same
8. High-res. Imagery	Some bottom photos more Required at specific sites	Same	
9. Heat Flow	Some? Need detailed study if feasible		
10. Mag & Grav.	Yes - surface lines Need deeptow magnetics		
11. Paleo cores Geotech cores	Some cores More needed		
12. Dredging	Some More sampling needed at selected targets		
13. Current Meter	Regional Not required		

Alvin samples fluid chemistry

Yes in general region of mound

TAG. (LOUDEN)

OCT '91

Site Survey Data Summary:			
SITE	PRI 2	PRI 3	PRI 4
Latitude: **Longitude:**	26° 08' N 44° 49' W	26° 08' N 44° 49' W	26° 08' N 44° 49' W
Environment: **Water Depth:** **Sed. Thickness:** **Penetration:**	MAR-Bare Rock 3700 m 0.1–0.5 m 600 m	MAR Bare Rock 3700 0.1– 0.5 2000	MAR Bare Rock 3700 0.1– 0.5 1000
TECHNIQUE			
1. High-res.SCS			
2. Deep pen SCS			
3. MCS+Vel.			
4. Seismic Grid			
5. Seis. Refrac.			
6. 3.5 KHz			
7. Multibeam Bathymetry	Same	Same	Same
8. High-res. Imagery			
9. Heat Flow			
10. Mag & Grav.			
11. Paleo cores Geotech cores			
12. Dredging			
13. Current Meter			

000341

SSP APPENDIX 4
TABLE 6
OCT '91

VICAP (380-Rev)

Site Survey Data Summary:			
SITE	VICAP	380-Rev.2	
Latitude: Longitude:	27.5-28.5°N 14.5-16°W		
Environment: Water Depth: Sed. Thickness: Penetration	D, G 3100-3600m >800--5500m ?		
TECHNIQUE			
1. High-res.SCS	✓		
2. Deep pen SCS	✓		
3. MCS + Vel.	✓		
4. Seismic Grid	✓		
5. Seis. Refrac.	✓- not processed		
6. 3.5KHz	? ?		
7. Multibeam Bathymetry	[To be acquired]		
8. High-res. Imagery	GLORIA (TBA)		
9. Heat Flow	some ?		
10. Mag & Grav.	✓		
11. Paleo cores Geotech cores	✓(paleo)		
12. Dredging	NA		
13. Current Meter	?		

~~R/V SONNE Cruise - 1992 Seus-vetl., refr.~~

SSP APPENDIX 4 . TABLE 7

OCT. 91

SITE SURVEY DATA SUMMARY. AREA NAAG.

TARGET SITE:	YERM-1	YERM & Z	YERM 3
Latitude: Longitude: Region:	81°06N 7° E YERMAK PL.	79°38 N 5°35 E YERMAK PLAT.	80° 28.5 N 8° 13 E YERMAK PLATEAU
Environment: Water Depth, m: Sed. Thickness(m): Penetration(m):	900 m 700 m 700 m, + Basement	1900 m 700? 700 m	975 m 8 500 m
TECHNIQUE:	Eastern Flank B	B	W flank / Median B
1. Single-Channel Seismic: Deep Penetration	—	—	—
2. Single-Channel Seismic: High Resolution	desirable could be Jordes an approach.	do	do
3. MCS & Velocity Determination	+ (very low frequency)	+	+
4. Grid of Intersecting Seismic Lines	+	+	+
5. Seismic Refraction	—	—	—
6. 3.5 kHz	+	+	+
7. Multi-Beam Bathymetry	—	—	—
8. High Resolution Imagery	desirable for drop-stones,	desirable for dropstones	desirable for dropstones
9. Heat Flow	+	+	+
10. Magnetics and Gravity	+	+	+
11. Cores: paleoenvironment geotechnical	+ +	+ +	+ +
12. Dredging	—	—	—
13. Current Meter (for bottom shear)	collect data on current.	—	—
	Subsidence of Y-pl. ref connection water exchange. Basement.	alternative to YERM 1.	alternative to YERM 4

Figure 6. Site Survey Data Summary Sheet

Reentry for depth-stones? and quick ice retreat.

CCT 91

SITE SURVEY DATA SUMMARY. AREA NAAG

TARGET SITE:	YERM 4	YERM 5	ARC 2a
Latitude: / Longitude: / Region:	80°16 N / 6°38 E. / YERMAK PLATEAU	77°58.5 N / 1°42 E / YERMAK PLATEAU	82°41.7 N / 7°32.7 E / ARCTIC OCEAN
Environment: / Water Depth, m: / Sed. Thickness(m): / Penetration(m):	600 / >2000 / 500 m	Plateau slope (G) / 2850 / >2000m / 600m	1600 / 600?
TECHNIQUE:	B		
1. Single-Channel Seismic: Deep Penetration	—	—	—
2. Single-Channel Seismic: High Resolution	desirable could be Sciders on approach	desirable could be Sciders on approach.	desirable.
3. MCS & Velocity Determination	+	+	+
4. Grid of Intersecting Seismic Lines	+	desirable.	very desirable.
5. Seismic Refraction	—		—
6. 3.5 kHz	+	+	needed
7. Multi-Beam Bathymetry	—		—
8. High Resolution Imagery	desirable (stones on sea floor)		—
9. Heat Flow	(+)	+	—
10. Magnetics and Gravity	+	+	—
11. Cores: paleoenvironment geotechnical	+ +	+ +	needed
12. Dredging	—	—	—
13. Current Meter (for bottom shear)	—	—	—

YERM 3 is an alternate.
Antlantic into Arctic.

Figure 6. Site Survey Data Summary Sheet

CCT 91

SITE SURVEY DATA SUMMARY. AREA NAAG

TARGET SITE:	FRAM 1B	FRAM 2	
Latitude: / Longitude: / Region:	78°33N / 5°WE / FRAM STRAIT.	78°22 N / 1°25 E / FRAM STRAIT	
Environment: / Water Depth, m: / Sed. Thickness(m): / Penetration(m):	2500 / >1000 / 810	1290 / 360 / 360	
TECHNIQUE:			
1. Single-Channel Seismic: Deep Penetration	+	+	
2. Single-Channel Seismic: High Resolution	—	—	
3. MCS & Velocity Determination	+	+	
4. Grid of Intersecting Seismic Lines	+	+	
5. Seismic Refraction	—	—	
6. 3.5 kHz	+	+	
7. Multi-Beam Bathymetry	—	—	
8. High Resolution Imagery	—	—	
9. Heat Flow	—	—	
10. Magnetics and Gravity	+	+	
11. Cores: paleoenvironment geotechnical	+ +	(+)	
12. Dredging	—	—	
13. Current Meter (for bottom shear)	—	—	

Figure 6. Site Survey Data Summary Sheet

000343

CCT 71

000344

SITE SURVEY DATA SUMMARY. AREA North Atlantic

TARGET SITE:	~~B4~~ EGM 1 x	EGM 2 xx	EGM 3 x
Latitude: / Longitude: / Region:	74°52N / 10°06.5W / East Greenland mar.	75°25 N / 07 20 W / E. Greenland marg.	73°28.5N / 13°09 W / E Greenland margin
Environment: / Water Depth, m: / Sed. Thickness(m): / Penetration(m):	Deep shelf slope / 3250 m / 900 m / 900 m	Deep Shelf Slope / 3400 m / ~750 m / 750 m	Deep shelf slope! / 2650 m / 1000 m / 900 m
TECHNIQUE:	all to Green EGM 2		all to Green 2
1. Single-Channel Seismic: Deep Penetration	—	—	—
2. Single-Channel Seismic: High Resolution	desirable	desirable	desirable
3. MCS & Velocity Determination	BRG 75-14 NGT 42	NGT 33	and? NGT 46
4. Grid of Intersecting Seismic Lines	[illegible] +	needed-	+
5. Seismic Refraction	—	—	—
6. 3.5 kHz	needed or 2	needed or 2	needed or 2
7. Multi-Beam Bathymetry	—	—	-
8. High Resolution Imagery	—	—	—
9. Heat Flow	may be needed if BSR is evident.	may be needed if Bottom SR	may be needed if BSR
10. Magnetics and Gravity	—	—	—
11. Cores: paleoenvironment. geotechnical	needed.	needed	needed
12. Dredging	—	—	—
13. Current Meter (for bottom shear)	— ?	—	-

Thiede.

xx WG gate way

x alt.

o ikke naant

SITE SURVEY DATA SUMMARY. AREA NAAG

TARGET SITE:	EGM 4	Green 1	Green 2
Latitude: / Longitude: / Region:	70°30N / 18°20W / E. Greenland slope	72°N / 15°W / NOT FIXED	72°30N / 13°W / NOT FIXED
Environment: / Water Depth, m: / Sed. Thickness(m): / Penetration(m):	Fan / 1500m / 1000m / 800 m	~1600 m / 500 m	~2500 m / 800 m
TECHNIQUE:			
1. Single-Channel Seismic: Deep Penetration	—	needed +?	needed +?
2. Single-Channel Seismic: High Resolution	desirable	desirable	desirable.
3. MCS & Velocity Determination	+	~~desirable~~ needed x	needed x
4. Grid of Intersecting Seismic Lines	needed	desirable	desirable.
5. Seismic Refraction	—	—	—
6. 3.5 kHz	desirable or 2	desirable	desirable.
7. Multi-Beam Bathymetry	—	—	—
8. High Resolution Imagery	—	—	—
9. Heat Flow	may be needed if BSR	—	—
10. Magnetics and Gravity	—?—	—	needed may exist.
11. Cores: paleoenvironment geotechnical	needed	—	needed
12. Dredging	—	—	—
13. Current Meter (for bottom shear)	—		—

alternate to EGM 2

Cruise planed for 1992.

Figure 6. Site Survey Data Summary Sheet

Oct '91

SITE SURVEY DATA SUMMARY. AREA NAAC

TARGET SITE:	ICEP 1	ICEP 2	ICEP 3
Latitude: Longitude: Region:	69°10N 12°25W N Atlantic (D)	66°54N 5°56W N Atlantic (D)	66°56N 6°27'W N Atlantic (D)
Environment: Water Depth, m: Sed. Thickness(m): Penetration(m):	 1950m 360 300m	 3250m 650m 650m	 2807m 300m
TECHNIQUE:			
1. Single-Channel Seismic: Deep Penetration	+	+	+
2. Single-Channel Seismic: High Resolution			
3. MCS & Velocity Determination	+	+	+
4. Grid of Intersecting Seismic Lines	?	?	?
5. Seismic Refraction			
6. 3.5 kHz	+	+	+
7. Multi-Beam Bathymetry			
8. High Resolution Imagery			
9. Heat Flow			
10. Magnetics and Gravity	+	+	+
11. Cores: paleoenvironment geotechnical	+ +	+ +	+ +
12. Dredging			
13. Current Meter (for bottom shear)			

alt. to IP-2

Figure 6. Site Survey Data Summary Sheet

Oct '91

SITE SURVEY DATA SUMMARY. AREA NAAC

TARGET SITE:	ICEP 4	IP 2	
Latitude: Longitude: Region:	67°02'N 7°58'W N Atlantic (D)	69°30'N 2°00'W N Atlantic (D)	
Environment: Water Depth, m: Sed. Thickness(m): Penetration(m):	 1800m 520m	 2000m 550m	
TECHNIQUE:			
1. Single-Channel Seismic: Deep Penetration	+	1 or 3	
2. Single-Channel Seismic: High Resolution			
3. MCS & Velocity Determination	+	2 or 3. needed.	
4. Grid of Intersecting Seismic Lines	?		
5. Seismic Refraction			
6. 3.5 kHz	+	needed	
7. Multi-Beam Bathymetry			
8. High Resolution Imagery			
9. Heat Flow			
10. Magnetics and Gravity	+		
11. Cores: paleoenvironment geotechnical	+ +	needed	
12. Dredging			
13. Current Meter (for bottom shear)			

alt ICEP 1

Figure 6. Site Survey Data Summary Sheet

0003455

SITE SURVEY DATA SUMMARY. AREA NAAG

TARGET SITE:	NISR	DST-1	DENS 1
Latitude: Longitude: Region:	63°50 N 07°05 W N flank Iceland Faeroe	~65°N } NOT ~27°W } FIXED. Du-Strait	~65 N } NOT ~32 W } Fixed [illegible] Strait.
Environment: Water Depth, m: Sed. Thickness(m): Penetration(m):	Ridge flank (G) 2000 1000 1000	B - G Cont rise 2500m 800m ? 500 m	B-G Cont rise
TECHNIQUE:	G		
1. Single-Channel Seismic: Deep Penetration		—	+
2. Single-Channel Seismic: High Resolution		needed for correlation with drift sed	needed for correlation with drift sediments
3. MCS & Velocity Determination	+	needed ?	Probably needed for correlation
4. Grid of Intersecting Seismic Lines	+ ?	needed.	needed (safety)
5. Seismic Refraction	—	—	—
6. 3.5 kHz	(+)	6 or 2	+
7. Multi-Beam Bathymetry	Seabeam	Desirable for drift morphology.	Desirable for drift morphology
8. High Resolution Imagery	Sidescan ?	desirable slumps on seafloor	desirable slumps on seafloor.
9. Heat Flow	—	—	—
10. Magnetics and Gravity	? needed ?	—	+
11. Cores: paleoenvironment geotechnical		needed	needed.
12. Dredging	—	—	—
13. Current Meter (for bottom shear)	Data should be collected	needed ? data should be collected.	needed + data should be collected

ice window need

ice window.

Figure 6. Site Survey Data Summary Sheet

Some old L. Johnson & RC data may exist but hardly sufficient

SITE SURVEY DATA SUMMARY. AREA NAAG.

TARGET SITE:	SIRS		
Latitude: Longitude: Region:	NOT FIXED.		
Environment: Water Depth, m: Sed. Thickness(m): Penetration(m):			
TECHNIQUE:			
1. Single-Channel Seismic: Deep Penetration			
2. Single-Channel Seismic: High Resolution			
3. MCS & Velocity Determination			
4. Grid of Intersecting Seismic Lines			
5. Seismic Refraction			
6. 3.5 kHz			
7. Multi-Beam Bathymetry			
8. High Resolution Imagery			
9. Heat Flow			
10. Magnetics and Gravity			
11. Cores: paleoenvironment geotechnical			
12. Dredging			
13. Current Meter (for bottom shear)			

Figure 6. Site Survey Data Summary Sheet

000346

SSP Appendix 4: Table 8. Oct '91

Site Survey Data Summary: NARM-DPG E. Greenland 63°			
SITE	EG63-1	EG63-2	EG63-3
Latitude: Longitude:	63°27.75' N 39° 43.5' W	63°05.9' N 38°38.2'W	62°40.75' N 37°27.45' W
Environment: Water Depth: Sed. Thickness: Penetration:	Passive Margin 520 m 440 m 940 m, 500 m bment	Passive Margin 1875 m 1220 m 1720 m	Passive Margin 2095 m 1420 m 1470 m
TECHNIQUE			
1. High-res.SCS	√	√	√
2. Deep pen SCS			√
3. MCS+Vel.	√	√	√
4. Seismic Grid	√	√	√
5. Seis. Refrac.	√	√	√
6. 3.5 KHz			
7. Multibeam Bathymetry			
8. High-res. Imagery			
9. Heat Flow			
10. Mag & Grav.	√	√	√
11. Paleo cores Geotech cores			
12. Dredging			
13. Current Meter			

Site Survey Data Summary: NARM-DPG E. Greenland 63

SITE	EG63-4		
Latitude: Longitude:	63°12.74' N 38°56.7' W		
Environment: Water Depth: Sed. Thickness: Penetration:	Passive Margin 1840 m 1180 m 1280 m		
TECHNIQUE			
1. High-res.SCS	√		
2. Deep pen SCS			
3. MCS+Vel.	√		
4. Seismic Grid	√		
5. Seis. Refrac.	√		
6. 3.5 KHz			
7. Multibeam Bathymetry			
8. High-res. Imagery			
9. Heat Flow			
10. Mag & Grav.	√		
11. Paleo cores Geotech cores			
12. Dredging			
13. Current Meter			

000347

Site Survey Data Summary: NARM-DPG Voring Margin			
SITE	VM-3	VM-5	VM-6
Latitude: Longitude:	67°25.0' N 02°48.0'E	68°50.0'N 05°25.0'E	69°0.0' N 03°0.0' E
Environment: Water Depth: Sed. Thickness: Penetration:	Passive Margin 1370 m 470 m 1270 m	Passive Margin 3180 m 470 m 870 m	Passive Margin approx. 3200 m approx. 600 m 650 m
TECHNIQUE			
1. High-res.SCS	√	√	
2. Deep pen SCS	√	√	√
3. MCS+Vel.	√	√	√
4. Seismic Grid	√	√	√
5. Seis. Refrac.	√	√	√
6. 3.5 KHz	√	√	√
7. Multibeam Bathymetry			
8. High-res. Imagery			
9. Heat Flow	√	√	√
10. Mag & Grav.	√	√	√
11. Paleo cores Geotech cores	√	√	√
12. Dredging			
13. Current Meter			

Site Survey Data Summary: NARM-DPG E. Greenland 66			
SITE	EG66-1	EG66-2	
Latitude: Longitude:	65°44.9' N 34°58.9' W	64°59.4' N 33°02.5' W	
Environment: Water Depth: Sed. Thickness: Penetration:	Passive margin 280 m 10 m (?) 510 m	1565 m Passive margin 620 m 720 m	
TECHNIQUE			
1. High-res.SCS	√	√	
2. Deep pen SCS			
3. MCS+Vel.	√	√	
4. Seismic Grid		√	
5. Seis. Refrac.		√	
6. 3.5 KHz			
7. Multibeam Bathymetry			
8. High-res. Imagery			
9. Heat Flow			
10. Mag & Grav.	√	√	
11. Paleo cores Geotech cores			
12. Dredging			
13. Current Meter			

Site Survey Data Summary: NARM-DPG Iberia Abyssal Plain			
SITE	IAP-1	IAP-2	IAP-3
Latitude: Longitude:	40° 41.0' N 11° 52.0' W	40° 41.0' N 12° 07.5' W	40° 41.0' N 12° 54.0' W
Environment: Water Depth: Sed. Thickness: Penetration:	Passive Margin 5200 m 2500 m 2550 m	Passive Margin 5200 m 850 m 950 m	Passive Margin 5500 m 1120 m 1220 m
TECHNIQUE			
1. High-res.SCS	•	•	
2. Deep pen SCS	•	•	•
3. MCS+Vel.	•	•	•
4. Seismic Grid	•	•	
5. Seis. Refrac.	•	•	•
6. 3.5 or 12 KHz	•	•	•
7. Multibeam Bathymetry			
8. High-res. Imagery	• (4/92)	• (4/92)	
9. Heat Flow	•	•	•
10. Mag & Grav.	•	•	•
11. Paleo cores Geotech cores	•	•	•
12. Dredging			
13. Current Meter			

Site Survey Data Summary: NARM-DPG Iberia Abyssal Plain			
SITE	IAP-3B	IAP-4	IAP-5
Latitude: Longitude:	40° 47.5' N 12° 45.0' W	40° 49.0' N 12° 28.5'W	40° 41.0' N 11° 36.0' W
Environment: Water Depth: Sed. Thickness: Penetration:	Passive Margin 5500 m 850 m 950 m	Passive Margin 5400 m 680 m 780 m	Passive Margin 5000 m 900 m 1000 m
TECHNIQUE			
1. High-res.SCS			
2. Deep pen SCS	•		
3. MCS+Vel.	• (11/91)	•	• (11/91)
4. Seismic Grid		•	•
5. Seis. Refrac.	•	•	•
6. 3.5 or 12 KHz	•	•	•
7. Multibeam Bathymetry			
8. High-res. Imagery			
9. Heat Flow	•	•	•
10. Mag & Grav.	•	•	•
11. Paleo cores Geotech cores	•	•	•
12. Dredging			
13. Current Meter			

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Site Survey Data Summary: NARM-DPG Newfoundland Basin			
SITE	NB-1	NB-4A	NB-7A
Latitude: Longitude:	45° 02.0' N 48° 44.0' W	44° 26.0' N 46° 53.0' N	44° 44.4' N 45° 22.5' N
Environment: Water Depth: Sed. Thickness: Penetration:	Passive Margin 1200 m >1650 m 1650 m	Passive Margin 3940 m approx. 2050 m approx. 2450 m	Passive Margin 4200 m 1600 m 1700 m
TECHNIQUE			
1. High-res.SCS	•		
2. Deep pen SCS			
3. MCS+Vel.		•	•
4. Seismic Grid			
5. Seis. Refrac.	•	•	•
6. 3.5 KHz	•	•	•
7. Multibeam Bathymetry	•	•	•
8. High-res. Imagery			
9. Heat Flow			
10. Mag & Grav.	•	•	•
11. Paleo cores Geotech cores			
12. Dredging			
13. Current Meter			

Site Survey Data Summary: NARM-DPG Galicia Bank			
SITE	GAL-1		
Latitude: Longitude:	42 40.0' N 12 48.0' N		
Environment: Water Depth: Sed. Thickness: Penetration:	Passive Margin 4500 m 550 m 650 m		
TECHNIQUE			
1. High-res.SCS			
2. Deep pen SCS	•		
3. MCS+Vel.	•		
4. Seismic Grid	•		
5. Seis. Refrac.			
6. 3.5 KHz			
7. Multibeam Bathymetry			
8. High-res. Imagery			
9. Heat Flow			
10. Mag & Grav.	•		
11. Paleo cores Geotech cores			
12. Dredging	•		
13. Current Meter			

MARK OCT 91

SSP APPENDIX 4 - TABLE 9

Site Survey Data Summary:			
SITE	MK1	MK2	
Latitude: Longitude:	23° 34' N 45° 02'W	23° 21'N,45°N 01'W	
Environment: Water Depth: Sed. Thickness: Penetration	Bare Rock 2500 m 0 m 500 to 1000 m	Bare Rock 3500 m 0 m 500 to 1000 m	
TECHNIQUE			
1. High-res.SCS			
2. Deep pen SCS			
3. MCS + Vel.	in the axial vally	in the axial vally	
4. Seismic Grid			
5. Refraction	in the axal vally		
6. 3.5KHz or 12 KHz	x	x	
7. Swath Bathymetry	x	x	
8. High-res.side locking sonar	scheduled for 1992		
9. Heat Flow			
10. Mag & Grav.	x	x	
11. Paleo cores Geotech cores			
12. Rock sampling	x	x	
13. Current Meter			
14. Passive seismics			
15. Submersible Sampling			
Photo/video	scheduled fro 1992	x	

APPENDIX 4: Table 10 Oct '91

Site Survey Data Summary:			
SITE	376 Rev.		
Latitude: Longitude:	10°38-45'N 42.5-44.5°W		
Environment: Water Depth: Sed. Thickness: Penetration	E, F, G 3500-600m 0-200m 200(?)-1000m		
TECHNIQUE			
1. High-res.SCS	TBA (Kasterns + Boretli???)		
2. Deep pen SCS	✓		
3. MCS + Vel.	(-Ratznitzia et al ., unpubl.)		
4. Seismic Grid	?		
Low res., 5. Seis. Refrac. Hi res., near-bottom	✓		
6. 3.5KHz	(?-probably)		
7. Multibeam Bathymetry	(-Needham, unpubl.)		
8. High-res. Imagery	Near bottom Side-scan sonar, photography		
9. Heat Flow	- (Not at drill sites ?)		
10. Mag & Grav.	✓		
11. Paleo cores Geotech cores	✓ (✓)		
12. Dredging	✓		
13. Current Meter	?		
14. Passive seismics	✓		
15. Submersible Sampling	✓		

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République Française

000358

Institut Français du Pétrole

23 October 1991

Mr. Jamie A. Austin
Institute for Geophysics
University of Texas at Austin
8701 Mopac Boulevard
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RECEIVED
OCT 25 1991
Ans'd............

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Our Ref. RE 20 ChS/JN N° 311 -16 160

Dear Jamie,

Please find enclosed the minutes of the September TEDCOM meeting, as well as some thoughts on the DCS development, which may be helpful for the DCS review.

Best regards

Charles

Charles Sparks

Encl. 1

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23 October 1991

THOUGHTS ON DCS

by C. SPARKS
Tedcom chairman

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OCT 25 1991
Ans'd...........

DCS II

DCS II is an enormous extrapolation (to 4 500 m) of a "piggy back" system that has been used successfully in the North Sea down to a few hundred metres (> 500 m?). The development of DCS II has required much ingenuity on the part of TAMU engineers, particularly in the development of seabed hardware. The latter is necessary to allow the API string to be anchored at the seabed and to stop the API bit from "heaving in the hole" during the running of the DCS string.

On leg 142 much time was spent ironing out teething troubles with the seabed hardware. As a result little time was really spent coring. Hence core recovery was disappointing.

More alarming was the complete wearing away of the diamond matrix on the DCS bit, each time it was deployed. Several factors may have contributed to this :

- unsuitable rock conditions (sand, gravel?)

- lack of mining drilling experience in operating the DCS system

- possible unexpected behaviour of the bit (vibration?) resulting from the movements/behaviour of the whole system, between the ship and the sea bed.

On leg 142 the rock should be more suitable and, in principle, mining drillers will be on board. Hence the prospects are much better than for leg 132. Seabed hardware has been improved and should cause less problems. Thus more time should be available for gaining experience with the operation of DCS. This must be used to the maximum event if it means repeating the same operation several times (eg. coring from 0-100 m).

Disadvantages of DCS II

Even if leg 142 is completely successful, DCS II will remain slow and inefficient to operate because of the secondary platform. This is long to take in and out of the system (about 10 hrs each way). It also limits the length of DCS joints to 3 m!

Safety aspects of DCS II are a worry but should not be exagerated. The sling shot tests have satisfied SEDCO about the consequences of API string failure. It should be possible to avoid DCS drilling in areas where high temperature fluids or toxic gas could prove dangerous for men on the secondary platform.

DCS III

This system (without secondary platform) is the one the TEDCOM has been recommending since leg 124E. It should avoid the disadvantages of DCS II mentioned above.

However DCS III is a more adventurous development (than DCS II) since there is no precedent - no existing system from which to extrapolate.

So far TAMU have concentrated on studying ways of tensioning the API string independently of the main compensator (with tensioners or using bumper subs). The 'tensioner system' would be greatly simplified if the guide horn on the JOIDES RESOLUTION could be eliminated. Hence the consequences of that elimination must be studied in detail first, before choosing the optimum system.

Ways of compensating the DCS string, with the required precision must then be studied.

DCS III will definitely be safer and more efficient to operate than DCS II. It may be long and costly to develop however.

000357

INSTITUT FRANCAIS DU PETROLE
Division "Exploitation en Mer"
RE.20 ChS/FB n°91/60

4 October 1991

TENTH MEETING OF THE JOIDES TECHNOLOGY AND ENGINEERING DEVELOPMENT COMMITTEE (TEDCOM)

Victoria, British Colombia
11th - 12th September 1991

Ch. SPARKS

000358

EXECUTIVE SUMMARY

1. The TEDCOM met for the first time in 12 months principally to discuss :
   - DCS development
   - Deep drilling

2. The TEDCOM noted the sling shots tests had satisfied SEDCO about the safety of the DCS Phase II.

3. The TEDCOM recommended that, on Eng. Leg 142, as much time as possible should be devoted to DCS drilling, even if this meant repeating the same operations (such as drilling to 100 mbsf) more than once. Secondary goals should only be pursued if the DCS is out of action.

4. At present two variant solutions are being examined for DCS Phase III (without secondary platform). Elimination of the guide horn on the JOIDES RESOLUTION would considerably simplify one of them.
   Before deciding on the optimal DCS Phase III concept, detailed studies of the consequences of eliminating the guide horn must be done. Such studies could be lengthy.

5. Deep drilling studies should be done by an outside consultant . TEDCOM members will assist TAMU in contacting suitable consultants.

6. Deep drilling studies should be based on TECP/LITPH/SGPP site data. The limits of three types of drilling should also be explored:
   - without riser
   - with riser
   - mining drilling.
   For potential consultants, TAMU should prepare an RFP to be vetted by TEDCOM. The RFP should be sent out to consultants before Leg 142. Interested consultants should be invited to present their plan of action at the next TEDCOM meeting, following which the chosen consultant will be designated.

7. ODP should take up KTB's offer for the joint development of a laboratory to analyse cores at high pressure.

8. Next TEDCOM will take place at College Station, early April (to be confirmed).

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LIST OF ATTENDEES

TEDCOM members :

Charles SPARKS, chairman	IFP
Mikhaïl GELFGAT	VNII BT
Keith MILLHEIM	Amoco
Heinrich RISCHMULLER	KTB
Howard SHATTO	Consultant
Michel TEXIER	ELF
Sverrin THORHALLSSON	NEA, Iceland

TEDCOM liaisons :

Jeff ALT	SGPP
Jamie AUSTIN	PCOM
Bruce MALFAIT	NSF
Eldridge MOORES	TECP
Daniel MOOS	LITHP
Mike STORMS	TAMU
Paul WORTHINGTON	DMP

Guests :

George GAMSAKHURDIA	USSR, Acad. Sciences
Roland LAWRENCE	DOSECC
Sangaku SUZUKI	JAMSTEC
Shinichi TAKAGAWA	JAMSTEC
Takeo TANAKA	JAMSTEC
Herb ZAREMBA	Consultant

TAMU staff :

Glenn FOSS
Leon HOLLOWAY
Eugene POLLARD

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Excused and absent members :

Roxanne CHRIST	Monash Univ.
John COMBES	Chevron
Hiromi FUJIMOTO	Univ. of Tokyo
Keith MANCHESTER	BIO
Claus MARX	ITE
Frank SCHUH	Consultant
Earl SHANKS	MEPSI
Alister SKINNER	BGS
Wally SVENDSEN	Consultant

TEDCOM AGENDA

11-12 September 1991

1. Introduction.
2. Legs 134/139 Operations summaries.
3. DCS Phase II Status.
4. Eng. Leg 142 Status.
5. Report on OPCOM.
6. DCS Phase III. State of studies.
7. Russian drilling technology.
8. Deep drilling studies - introduction.
   - 8.1 TECP deep site data
   - 8.2 LITHP "
   - 8.3 SGPP "
9. Reports on recent working groups.
   - 9.1 Offset Drilling WG.
   - 9.2 N. Atlantic Margins WG.
   - 9.3 In situ Pore Fluid Sampling WG.
10. Deep drilling studies by TAMU.
11. Committee matters (closed session).
12. Tour of JOIDES RESOLUTION.
13. Status of Soviet and Japanese drillships.

1. INTRODUCTION

Charles SPARKS opened the meeting by welcoming participants and in particular new members Mikhaïl GELFGAT (for the USSR) and Sverrir THORHALLSSON (for ESF). The latter had been nominated by ESF following TEDCOM's request for an 'iclandic engineer with high temperature drilling experience'. Since the previous meeting, Harald STRAND (ESF) and Paul STANTON (Exxon) had both resigned from the TEDCOM. The TAMU liaison to TEDCOM had also changed. Barry HARDING had been rotated off and Mike STORMS had taken his place.

He explained that the principal subjects to be treated at the tenth TEDCOM were the DCS and deep drilling. Safety 'sling shot' tests had recently been carried out on the DCS, the Phase II version of which would be retested on Leg 142, the third engineering leg (Jan - March 1992). Feasability studies of the DCS Phase III (without secondary platform) had recently been carried out by two companies.

Following the previous Tedcom meeting's recommendations, detailed information about hypothetical deep drilling sites had been transmitted to TAMU where studies had been initiated.

In order to allow the maximum amount of time for these important subjects the work on other ODP tools would not be reviewed during the tenth Tedcom.

Charles Sparks then presented the agenda.

2. OPERATIONS SUMMARIES

The operational high-lights of Legs 134-138 were presented by Mike Storms and later in the day Glenn Foss spoke of the most recent Leg 139.

Leg 134 (New Hebrides - Oct. to Dec. '90)

Three deep holes were drilled: two to more than 1000 m with good core recovery using the RCB in volcaniclastic sediments; one to 850 m in spite of hole stability problems (from 140-730 mbsf) which were controlled successfully using mud pills.

A logging program was highly successful in salvaging scientific objectives over intervals of poor core recovery.

The scribing core catcher for the hard rock orientation (HRO) system was tested successfully.

Leg 135 (Lau Basin - Dec. '90 to Feb. '91)

Severe stuck pipe problems occurred on four occasions. Hydrolex jars were twice used successfully to free them.

The MDCB was tested on two holes. On 834A it was deployed at 145 mbsf but failed to rotate, as painted marks revealed. On 839A it was used to core 0.5 m with 90 % recovery at 218 mbsf. coring took 46 min at the end of which time the diamond impregnated bit was missing. The MDCB is now being remodified in order to prevent it from stalling.

Leg 136 (Honolulu - March '91)

A hole was drilled and cased to basement (260 mbsf) as part of a long term goal to establish an ocean seismographic network (OSN). The borehole re-entry cone Seal (CORK) was deployed and retrieved successfully.

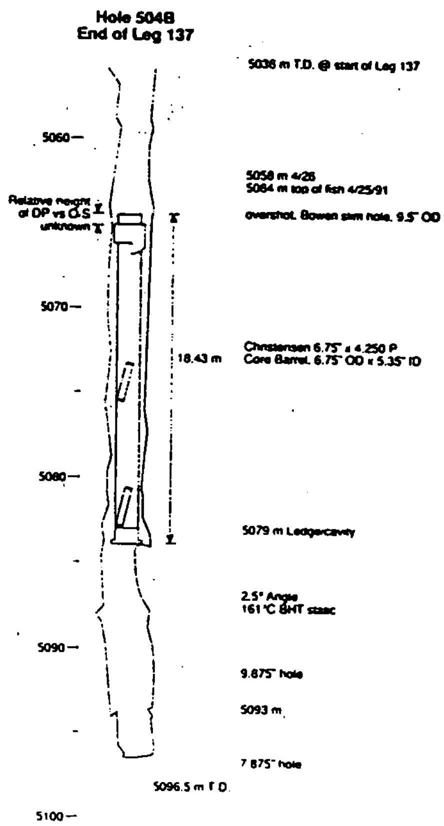
A special Amoco designed PDC 'anti-whirl' bit was used to core 79 m into basement at an impressive average ROP of 5.5 m/hr. Core recovery was disappointing however at 20 %.

Leg 137 (Hole 5043 - April '91)

Junk left over from Leg 111 was successfully removed from 504 B after deploying a junk basket and five junk mills.

The hole was then deepend to 1611 mbsf using the RCB followed by a conventional oil field rotary core barrel.

The uppermost stabilizer then failed leaving 18 m of 6³/4 inch core barrel to rejunk the hole.



The inferred position of the fish in Hole 504B.
DP = drill pipe (Christensen core barrel);
O/S = overshot.

Leg 138 (E. Equatorial Pacific - May-July '91)

This leg was exceptional for the number of holes cored and the quantity of Core recovered. A total of 42 holes were cored at 11 sites. Total length cored was 5542 m with 5536 m recovered! Furthermore 12 beacons were deployed and all were successfully recovered.

Leg 139 (Sedimented Ridges - July-Sept. '91)

Drill in casing was used on this leg. The CORK was deployed twice and the PCS was used operationally. Two reentry cones were set and one hole was cased to 900 m.

Strange formation conditions were encountered. The temperature rose to 270°C at 19 mbsf and then fell away. This was thought to be due to in flow from an adjacent hole. In situ pore pressure was found to be much less than hydrostatic pressure!

Temperature and pressure measurements were taken near the surface with the WSTP.

The high bottom hole temperatures (up to 300°C) were cooled very successfully by pumping which reduced them to around 40°C.

Charles SPARKS asked whether action had been taken on a joint ODP/KTB development of a laboratory for analysing PCS cores at high pressure (see ninth TEDCOM, point 6). None so far, he was told. Heinrich RISCHMULLER confirmed the offer was still open.

3. DCS PHASE II STATUS

Leon HOLLOWAY began by giving a brief presentation of the DCS system for the benefit of new members.

3.1 Sling shot test

The most significant recent development in the DCS had been the testing of the shock absorbing safety system on the secondary platform. This was designed to reduce upward acceleration of the secondary platform, to acceptable levels for men working thereon, in case of failure of the tensioned API string.

SEDCO had insisted on these tests, without which they would have been reluctant to allow their personnel to go on working on the secondary platform.

The most severe test had produced 8" of travel in the cylinders (with an allowable maximum of 24") and a maximum of 2.5 G. SEDCO had been satisfied by these tests.

It was hard for TEDCOM members to understand the significance of these tests without a sketch. The final report will be sent out to all members as soon as it is completed.

3.2 Seafloor hardware

The seafloor hardware system associated with the DCS has been considerably modified since Leg 132. In particular the hard rock base has been redesigned with three legs, instead of four, to prevent rocking, and the cone righting system uses counter weights instead of buoyancy material.

Unlike the system on Leg 132, the drill-in BHA would be used straight away with the HRB, without drilling an exploratory hole. If problems are encountered the HRB can be moved.

A nested drill-in BHA system (see sketches of Appendix A) was presented that allows reaming of the DCS hole, for logging purposes and coring with a $7^{1/4}$" DCB suspended from the primary compensator (sketch 27), for use in rubbly material.

Sverrir THORHALLSSON asked whether other casing systems had been studied, since Iceland has a system based on air hammers, suitable for shallower depths. Mike STORMS said other options will be looked at.

Core catchers had also been changed (See Appendix A) and a float valve added to prevent loose material entering the barrel.

Charles SPARKS asked about the worn bits on Leg 132 and whether TAMU now understood why this had occurred. Mike STORMS said the bits had definitely worn away and not broken off. New extended crown bits have been developed for Leg 142. Also, Leg 132 was drilled with a friction reducer to reduce torque drag. On Leg 142 a polymer will be tried as a friction reducer.

4. LEG 142 STATUS (18 Jan - 19 March '92)

Mike STORMS presented the program for Leg 142. Thirty six days would be spent on site at the East Pacific Rise (EPR), in a water depth of 2590 m. The goal was to core 100 m with at least 50% recovery.

Several secondary engineering objectives were also presented including evaluating the following: the ability to do slim hole logging in a DCS hole; reaming a DCS hole from 4" to 7 1/4"; deploying a two stage BHA; the potential of the 7 1/4" diamond core barrel (DCB).

Charles SPARKS suggested it would be wise to pursue the secondary objectives only if the DCS was out of action. Otherwise all time possible should be used to gain as much experience as possible with the DCS even if this meant drilling repeatedly to 100 m. Other TEDCOM members agreed.

Keith MILLHEIM gave technical advice on how to get the best results with the DCS. Polymers should be used to abate vibration. ODP should try not to trip the pipe at all, if drilling through rubble. Impregnated bits should be used (not surface set diamonds), for which a life of 50 m/bit was <u>not</u> too optimistic. Mining drilling expertise <u>must</u> be used, since an experienced mining driller could probably get 5-10 times as much life out of a bit as an inexperienced one.

Heinrich RISCHMULLER confirmed that KTB insisted on using mining drillers. They forced their drilling contractors to merge with mining drilling companies.

In reply to a question from Dan Moos, Mike STORMS explained that he expected an ROP of 2-3 m/hr in the East Pacific Rise rocks.

Jamie AUSTIN explained that the goal at EPR in a few years was to drill to 1500 m. Temperatures might reach 350-400°C although very little was known about the subsurface thermal system there. It could be the top of a magma chamber.

Sverrir THORHALLSSON added that in Iceland they had found it easiest to drill directly vertically into high temperature regions.

5. OPCOM

An 'opportunities committee' was formed in June '91 to discuss the best way of spending additional funds made avalable by NSF. Keith MILLHEIM attended on behalf of TEDCOM.

Bruce MALFAIT explained that NSF had initially budgeted for M$41.4 for 1991, where the Long Range Plan had called for M$43.5. Following the end of the Gulf War, the fall in fuel prices and the entry of the USSR into the program, NSF felt they could now release the extra M$2.1.

Jamie AUSTIN said he believes the M$2.1 to be a 'step function' annual increase and not just a spike bonus. OPCOM voted (see Appendix B, for extract of minutes) extra spending on the DCS as their top priority and proposed an additional M$1.675 in '92 and M$0.225 in '93.

At the OPCOM meeting Keith MILLHEIM had also suggested using an alternate platform (to the JOIDES RESOLUTION) for two legs :

Atolls and Guyots

New Jersey Sea Level

and also for further testing/developing the DCS. He said that an alternate platform would enable the DCS heave compensator to be thoroughly tested, which is the only difference compared to a standard mining system.

He added that ODP should work at improving the efficiency of operation of the JOIDES RESOLUTION. This would probably require a major paradigm phase shift. Bruce MALFAIT pointed out that a performance evaluation committee exists already. A criteria for measuring efficiency of scientific missions was difficult to choose.

The discussion moved on to ways of obtaining financial support from industry for developments such as the DCS. Charles SPARKS said that he had brought this up at the Kona PCOM meeting, where he had learned that it could lead to a problem of industrial ownership (patient rights). Heinrich RISCHMULLER said this had never caused a problem at KTB. ODP should be a member of DEA (drilling engineering association), the TEDCOM concurred. Most DEA projects are less than $100,000 but a few are much more costly than that.

Running a DEA project is no problem, it was pointed out, but preparing a proposal needs time and care, if it is to have a chance of succeeding. Michel TEXIER and Keith MILLHEIM both offered to assist TAMU by sending them examples of successful proposals.

Following Jamie AUSTIN's comments that TAMU could do no more and that ODP needed advice since they could not join DEA, it was suggested that TAMU contact BILL MAU, a wellknown successful proposer of DEA projects. Heinrich RISCHMULLER added that ODP was in the same boat as KTB. They should use more outside consultants who have the merit of generating new ideas.

6. DCS PHASE III

Charles SPARKS recalled that the TEDCOM had been saying, since the first engineering leg (Jan. '89), that the DCS secondary platform must ultimately be eliminated and the operators brought down to the rig floor. The reasoning then had been based on considerations of efficiency, running time and handling time of the secondary platform. Since then questions of safety had arisen. Men on the platform were seen to be very vulnerable to the results of drillstring failure (sling shot effect) also to H2S or hot fluid welling up the DCS string, since they would not be able to escape quickly from the secondary platform. These considerations had led PCOM to decide to accelerate the development of DCS Phase III (version without secondary platform).

Mike STORMS explained that a request for proposals (RFP) for the DCS III had been sent out in May to a large number of companies. Three replies had been received from Earl & Wright, Stress Engineering and SEDCO. As a result the first two had been invited to carry out feasability studies on two quite different Schemes.

Earl & Wright, who knew the ship well, favored using tensioners (See Appendix C) to maintain tension in the API string, which would then allow the top of the string to be used as a reference point for the compensator of the DCS string. E & W estimate it would take about $500,000 to build.

Stress Engineering prefered using an above-sea floor slip joint with weights and pulleys to maintain both the upper and the lower sections of the string in tension. Stress estimate their solution would take $250,000 to build.

It was difficult to appreciate the full details of the two systems since complete data was not available. Final Reports will then be sent to the TEDCOM members concerned, for comments, as soon as they are received. Several oil company specialists had been contacted about industry experience with bumper subs (Terry Gardener, Mark Childers, Gary Marsh, Ed Fischer etc.).

Howard SHATTO commented on the slip joint solution, saying the differential movement between the API and the DCS strings would induce friction and hence fluctuating WOB of the DCS. Furthermore the behavior of the whole system, including dynamic and hydrodynamic effects of the counter weights would have to be analysed.

Charles SPARKS asked if it would be possible to eliminate the guide shoe in the moon pool, which would greatly simplify the tensioner solution. Keith MILLHEIM suggested a trade off study be done to determine the benefits of eliminating the guide horn. The TEDCOM recommended a thorough analysis be done of drillstring behavior without the guide horn, before proceeding further. This could lead to a complete rethink of the tensioner solution. The decision between the two solutions could then be taken in about a year's time.

Charles SPARKS pointed out that there was an important message there, that DCS III was going to take some years to develop (at OPCOM there had been talk of testing it on Leg 147 in Nov. '92!).

7. RUSSIAN DRILLING TECHNOLOGY

Mikhaïl GELFGAT briefly presented russian technology of his invention, which allowed pilot coring without pulling the drillpipe. The system had been used successfully on the Kola Superdeep well SG-3 and on SG-8 between depths 3700 m and 4700 m.

The new technology was also tested on D.V. 'Bavenit' early this year, where 50 m were cored without pulling the string. But 50 m were not a limitation.

VNIIBT would like the opportunity of trying this technology on the JOIDES RESOLUTION. Jamie AUSTIN said their proposal would be reviewed once it had been received.

VNIIBT would like the opportunity of trying this technology on the JOIDES RESOLUTION. Jamie AUSTIN said their proposal would be reviewed once it had been received.

8. DEEP DRILLING STUDIES - INTRODUCTION

Charles SPARKS introduced the subject by recalling the decisions that had been taken following the Deep Drilling Workshop of September 1990, at which continental deep drilling experience had first been presented and discussed. TEDCOM had then decided that the way forward, for deep drilling in the ocean, was for TAMU to carry out (or subcontract) detailed studies based on hypothetical site data, to be provided by the thematic panels concerned (LITHP, TECP, SGPP). Results of these studies would then be reviewed by TEDCOM.

PCOM had accepted the above recommendation, following which TECP had a total of four sites. LITHP had followed with data for a superdeep site in May. SGPP was about to provide data. The thematic panels data, as well as the conclusions of recent specialized working groups would first be presented, followed by recent deep drilling studies by TAMU.

8.1 TECP deep site data

Eldridge MOORES presented the data for four real deep sites that interested TECP (See Appendix D). He stressed that the most challenging, but the highest priority, for his panel, was the site in the Northern Newfoundland Basin, which is a passive margin. High stress regimes and high pore fluid pressures would probably be encountered. There was a danger of encountering hydrocarbons (the area is near Hybernia).

The TEDCOM pointed out that the presence of high pore pressures meant that mud would have to be used which implied well control with a riser. More information about possible pore pressures should be provided by TECP. Eldridge MOORES promised to try and provide such information, but pointed out that one of the reasons why TECP wanted to drill there was to determine the pore pressure!

8.2 LITHP deep site data

Dan MOOS explained that LITHP had originally considered providing TAMU/TEDCOM with data on seven sites but had finally condensed it down to one hypothetical site in which the difficulties of several of them were included (See Appendix D). This site involved drilling a complete section of 'typical' ocean crust below 4 km of water. The total drillstring length required would be around 10 km. LITHP anticipated severe stability problems followed by disking of cores (as on the lower part of 504 B). Wellbore failure resulting from high stresses, and lost circulation due to high permeabilities should also be anticipated. Hard epidote-quartz assemblages could be encountered which could be difficult to drill. Some of the anticipated gabbros in the zone 2-5 kmbsf could be easier to drill.

Jamie AUSTIN reacted by asking whether LITHP believed there was such a thing as a typical section of oceanic crust. He personally was coming round to thinking that offset drilling was a more promising way to go, since it would allow samples from all parts of the crust to be taken much more easily and in several different areas of the globe.

He was in favour of using the JOIDES RESOLUTION in this way and pushing it to the limit. This had not yet been done by ODP, which had not even required it to exceeded the performance of the GLOMAR CHALLENGER. Mike STORMS pointed out that the LITHP hole definitely exceeded the capacity of the JOIDES RESOLUTION which did not have a 10 km drillstring.

Charles SPARKS said the study should not be limited to the JOIDES RESOLUTION.

8.3 SGPP deep site data

Jeff ALT presented SGPP deep site data which related to Site C of ODP proposal N° 061. This site (See Appendix D) is close to DSDP 241 and would require penetrating through 1500-2000 m of sediment into the igneous crust below 4900 m of water.

Keith MILLHEIM noted that most ODP coring was done in soft rock. Research was required to improve recovery in medium/hard rock (too hard for APC coring).

9. REPORTS ON RECENT WORKING GROUPS

9.1 Offset drilling WG

Eldridge MOORES presented the principal conclusions of the WG. Offset drilling was a way of getting samples of all layers of the ocean crust in a particular zone without imposing the enormous technical problems involved in getting them from the same section. There were many possible sites where this could be done at both fast spreading areas (Hess Deep, Discovery Deep near CTJ) and slow spreading ones. The major objectives of offset drilling would be to explore junctions between layers 2/3 and layers 3/4: Also to take long sections of layers 3 and 4 (mantel).

Problems would remain in relating the different parts of section to each other and in defining "standard crust".

Judging from scientific holes drilled in Cyprus, drilling Layer 3 should not be difficult but problems due to faulting could be encountered at the junction with Layer 4 (MOHO). Studying the experience in Cyprus could be beneficial to TAMU. Information on the Cyprus sites can be obtained from John MALPAS and Paul ROBINSON.

9.2 North Atlantic Rifted Margins Working Group

Further background to deep drilling was provided by Jamie AUSTIN who reported on the recent meeting of NARM-WG using a viewgraph provided by Dale SAWYER (C. Sparks has since received a 100 page report from the WG!).

This WG is looking for a long term Commitment to drill a large number of deep and difficult holes in the N. Atlantic. Their original proposal consisted of 25 legs (2 months each) but this had recently been pruned to 8.

The object of the NARM program is to investigate fundamental questions about continental break up. The proponents particularly wish to compare results obtained at:

- thin crusted volcanic margins (E. Greenland/N.W. Europe)
- thick crusted multi-rifted non-volcanic margins (Iberia Abyssal Plain/ Newfoundland Basin).

Location of the various sites and data on proposed holes are given below. The Newfoundland Basin site NB-4A has the highest priority in the program. It would also be the most challenging since it would require coring 200 m of basement below 2250 m of sedement in 4000 m of water.

IAP-1 would also be very challenging (see table). Such a program would be an excellent way of pushing the JOIDES RESOLUTION to its limits.

PCOM will voted on this program at the Annual meeting in December '91. Drilling could begin in '92.

Figure A. Compilation of all high priority drillsites selected by the NARM DPG (filled circles; see Table A for detailed information); and all high priority drillsites south of 80°N selected by the NAAG DPG (asterisks). Abbreviations and corresponding proposal numbers are: EG, East Greenland, 310 & 393; GAL, Galicia, 334; IAP, Iberian Abyssal Plain, 365; NB, Newfoundland Basin, 365; VM, Voring Margin, 358. Continental outlines and mid-ocean ridge axes are indicated by heavy lines; shelf breaks by light lines. Digital map courtesy of PLATES/UTIG (M. Coffin and L Gahagan).

Table A. Proposed drillsites, drilling order, and estimated drilling times

Drilling Order	Site Name	Water Depth	Sediment Penetration	Basement Penetration	Total Penetration	Days[1] on Site
Volcanic Margins						
1.1	EG63-1	520	440	500	940	20
1.2[2]	EG63-2	1875	1220	500	1720	48
2.1	VM-3	1370	470	800	1270	23[5]
2.2	VM-5	3180	470	400	870	17
2.3	VM-6	3370	600	50	650	9
3.1[3]	EG63-3	2095	1420	50	1470	24
3.2[3]	EG63-4	1840	1180	100	1280	24
4.1	EG66-1	280	10	500	510	16
4.2	EG66-2	1565	620	100	720	17
Non-Volcanic Margins						
1[4]	IAP-4	5400	680	100	780	15
	IAP-2	5200	850	100	950	19
	IAP-3B	5500	850	100	950	19
	IAP-3	5500	1120	100	1220	25
	IAP-5	5000	900	100	1000	20
2	NB-4A	3940	2250	200	2450	~45
3	IAP-1	5200	2500	50	2550	~50
ANY	NB-7A	4200	1600	100	1700	36
	NB-1	1200	1650	0	1650	19
	GAL1	4500	550	100	650	11

[1] including logging time
[2] later deepening, if required by results of initial 500 m basement penetration
[3] contingent on the results of first three sites
[4] only 2 to 4 of this group of sites should be drilled. The order and number of sites drilled depends on the outcome of the early drilling. See Section 4.3.4 for further explanation.
[5] no logging time added

9.3 In situ Pore Fluid Sampling WG

To complete the series of background presentations Paul WORTHINGTON spoke briefly about the above WG, which had been held in Aug. '91 with 24 attendees including 10 from industry (non-ODP).

The W.G. reviewed ways of getting better pore fluid samples than has been possible to date. The result was a really fresh look at the potential of the wireline sampler. Finally the participants proposed four possible approaches to in situ fluid sampling:

- a modified wireline sampler, (possibly as go-devil for the straddle packer)
- a self-boring water sampler (used with the RCB)
- a full-bore straddle packer, (using multiple packers set in redrilled cement)
- re-entry deployment of modified commercial formation testers.

The next step will be an engineering feasibility study. A RFP will be sent out in the New Year.

10. DEEP DRILLING STUDIES BY TAMU

Gene POLLARD presented the TAMU report on the deep drilling capability of the JOIDES RESOLUTION (See Appendix E). The object was to study ways of achieving 2-3 km penetration in 2-3.5 km of water, using existing equipment, and to identify problems that need investigating to improve coring of deeper holes. Conditions similar to Hole 504 B were assumed.

The scenario assumed consisted of drilling three holes (A, B and C). Hole A would be a pilot to check against hydrocarbons. Hole B would extend 200 m into basement and would allow geological evaluation, logging and sampling to be carried out. Hole C would complete the series and would be double or triple cased. Only the RCB had been considered, although the deeper sections of the hole could be continued with a modified DCS or downhole motor.

The report stresses the importance of logistics (helicopter access, supplementary shipments of mud and casings) as well as optimal choice of weather conditions (low wind, wave, current), if success is to be achieved.

The potential problems explored (See Appendix E) include: Hole instability, wall swelling (hole undergage), thermal shock, low ROP, spot coring, bit development, poor core recovery, high temperatures, stuck pipe, deviations from the vertical, safety (possibility of hydrocarbons).

Limitations of the JOIDES RESOLUTION that are explored include:

- Absence of a riser, denying the possibility of well control (to 'pump away' mud would cost at least $2000/hr).
- Casing limits in 5000 m of water:
  - 1000 m 20"
  - 1250 m 16"
  - 2000 m 11 3/4".

  (See also Appendix F presented by Roland LAWRENCE)
- Drill pipe limits.
  With 8230 m deployed static stresses reach 64% of ultimate, but allowance must be made for dynamic effects.
- Coring wireline.
  Working limit 18000 lbs. Hence at 0.5 lb/ft it is good for 8230 m.

The estimated times for reaching 2000 mbsf were 106.5 days and 101.4 days, with and without a liner respectively.

Gene added that running long casing strings in high current areas is dangerous and should be avoided. At Nankai cross currents were encountered, and the ship had to be allowed to drift 25 km while casing was run. Very strong vibrations were also experienced that could be heard all over the ship.

Heinrich RISCHMULLER commented that he felt a motor steering system at the drill bit would be essential to control deviations. KTB had spent millions on this and had been successful in keeping deviations down to 1° in their main hole.

Jeff ALT asked how core recovery could be improved and was told that recovery falls with depth in pillow basalts, even down to 15%. Fractured rock is a problem for everyone. There is no way of getting good recovery with roller cone bits. Diamond bits can give good recovery, although it depends on the rock encountered. PDC bits give good recovery but wear out fast (1-11/2 hrs ou 504 B). Fluctuating WOB leads to break up of diamond bits.

During further discussion it was suggested that TAMU now use an outside consultant to do further deep drilling studies. These should be based on the following:

- LITHP Hypothetical deep site data.
- TECP Newfoundland Basin NB3.
- SGPP Western Somali Basin.

Furthermore the consultant should assess the following:

- the maximum depth that can be drilled without a riser
- max. depth that can be drilled with a riser.
- the capabilities of a mining drilling system.

TAMU should prepare an RFP for potential consultants. This should be sent to TEDCOM members for comments. It should then be sent out to potential consultants, before Eng. Leg 142 (Jan 18th '92). Interested consultants should be invited to the next TEDCOM to present their proposals. The TEDCOM would then recommend a consultant.

11. COMMITTEE MATTERS (closed session)

The meeting ended with a closed session (subject of a separate write up) between members during which TEDCOM membership, mandate and chairmanship were discussed. The principal outcome was:

- one or possibly two new US members will be looked for.
- the TEDCOM intends to become more active in initiating and controlling technological developments within ODP.
- Charles SPARKS remains chairman of the TEDCOM.

12. TOUR OF JOIDES RESOLUTION

During the ship visit George GAMSAKHURDIA and Shinichi TAKAGAWA gave short presentations on the future scientific drillships of their respective countries (See Appendix G).

TENTH MEETING OF THE JOIDES TECHNOLOGY AND ENGINEERING DEVELOPMENT COMMITTEE (TEDCOM)

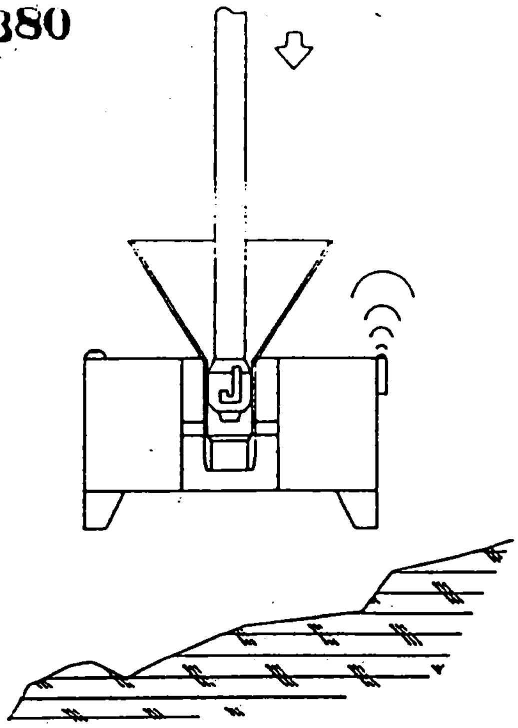
APPENDICES

000378

APPENDIX A

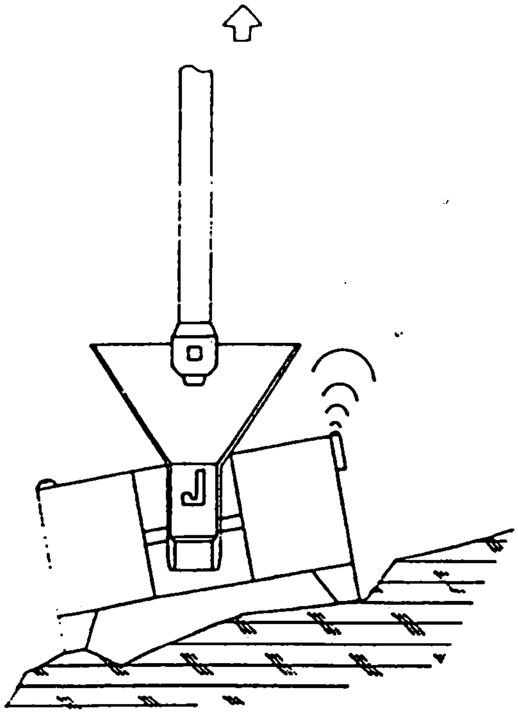
DEPLOYMENT SCHEME FOR NESTED DRILL-IN BHA SYSTEM (DCB FOLLOWED BY DCS)

000380



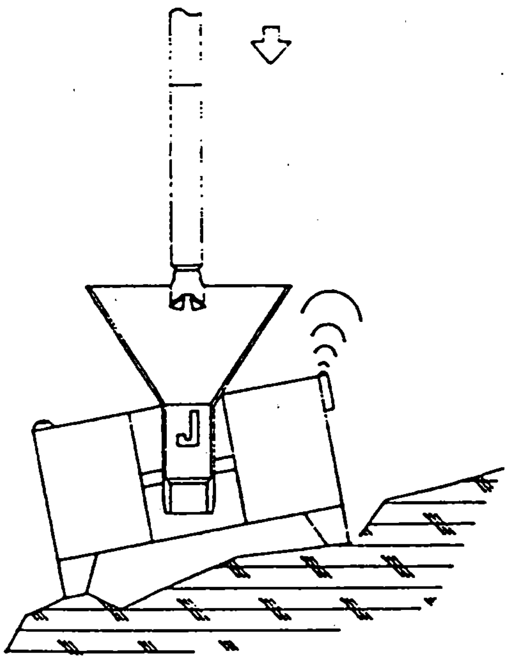
1

LOWER MINI HARD ROCK GUIDE BASE (HRB) TO SEAFLOOR AND VERIFY ACCEPTABLE ORIENTATION



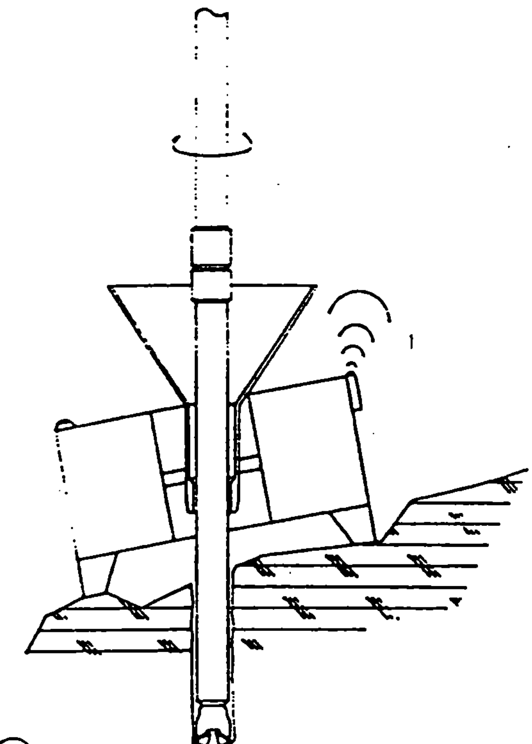
2

UN-J AND REMOVE RUNNING TOOL



3

RE ENTER CONE WITH PRIMARY DRILL-IN-BHA (DI-BHA) ASSEMBLY

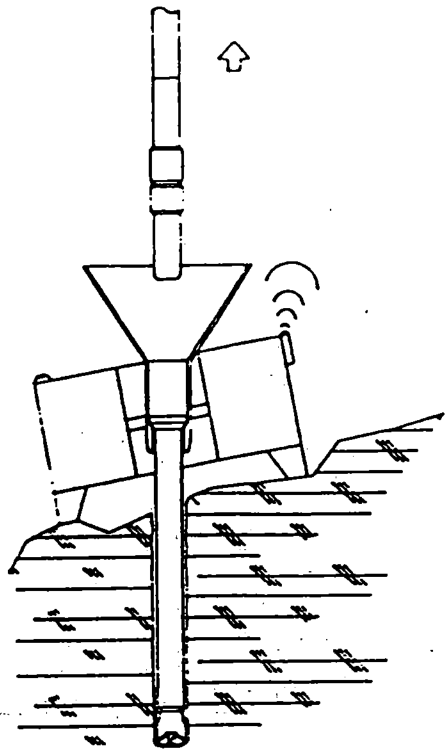


4

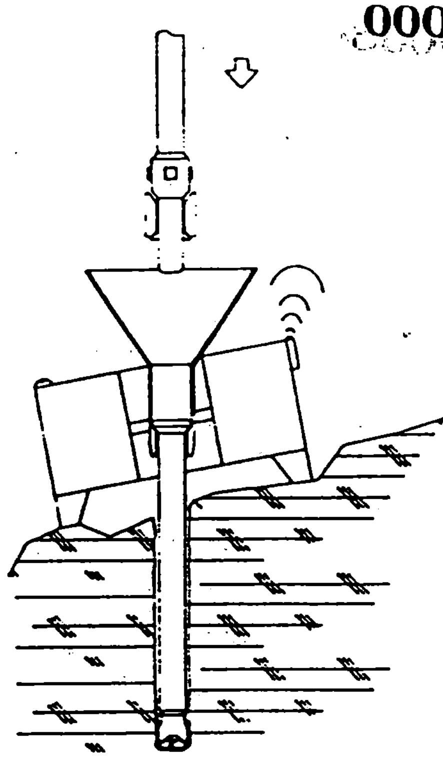
DRILL IN PRIMARY DI-BHA TO PRESENT DEPTH

Deployment Scheme for Nested Drill-in-BHA System

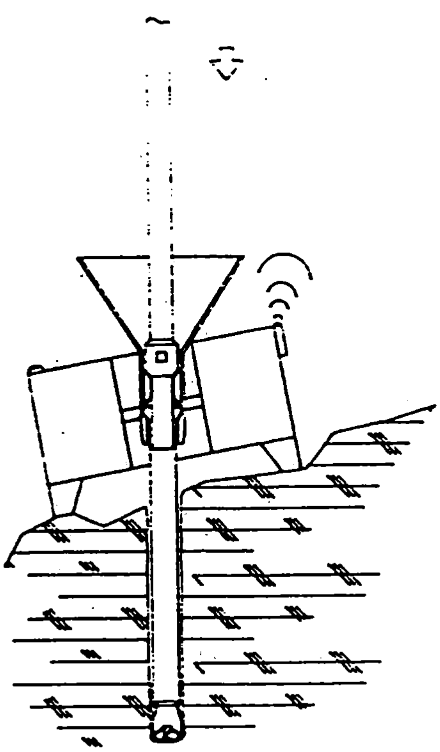
(DCB Followed by DCS)



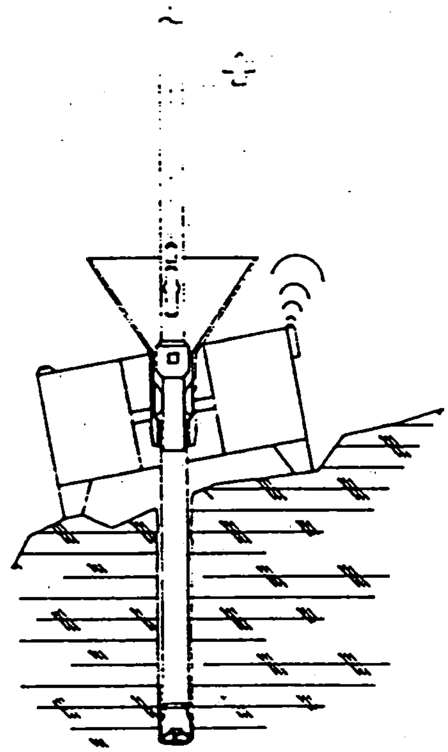
5 BACKOFF PRIMARY DI-BHA AND RETRIEVE STRING



6 LOWER TENSIONING SUB AND REENTER HRB WITH BIT GUIDE



7 LATCH IN AND TENSION UP AGAINST HRB

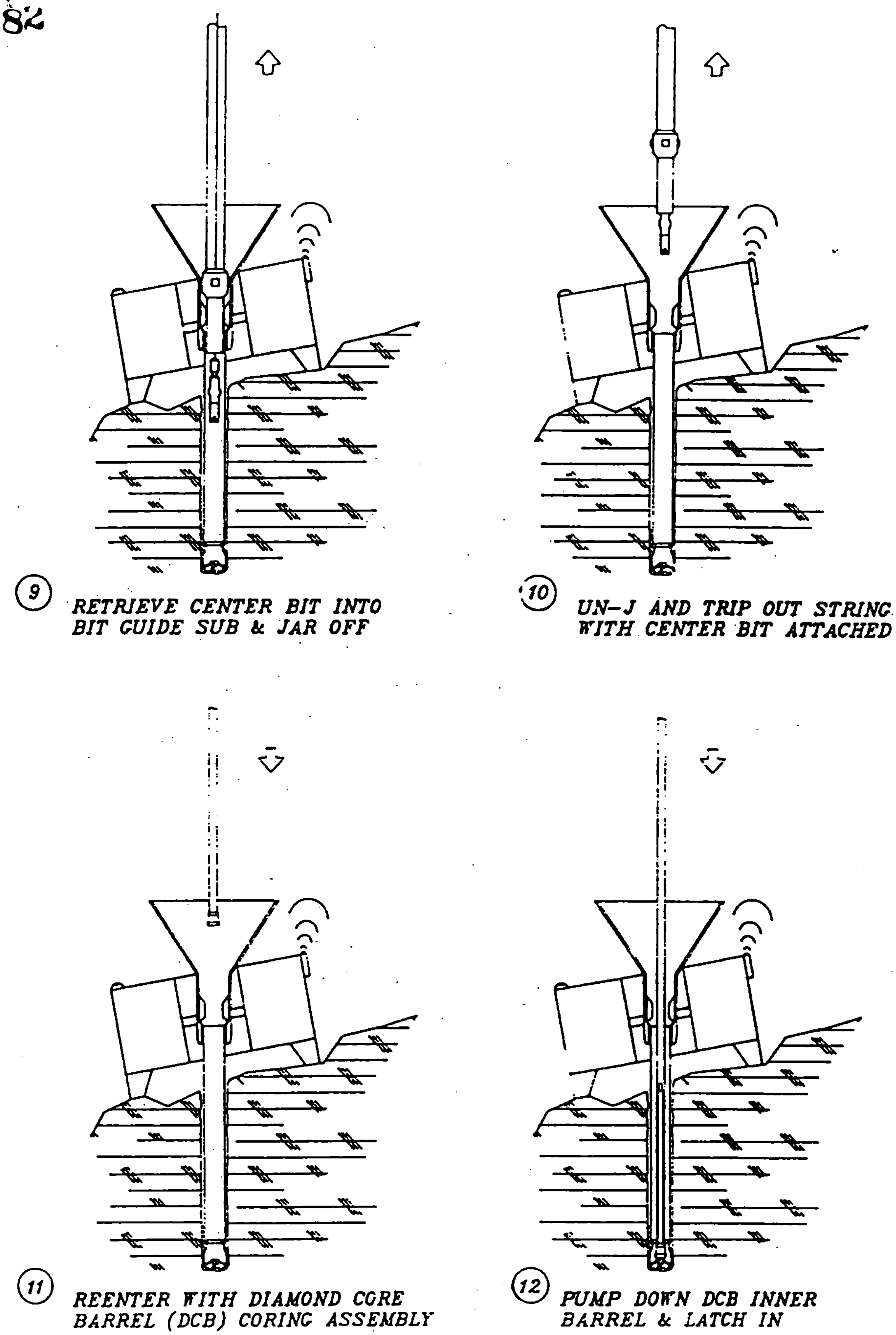


8 RELEASE BIT GUIDE VIA WIRELINE

Deployment Scheme for Nested Drill-in-BHA System

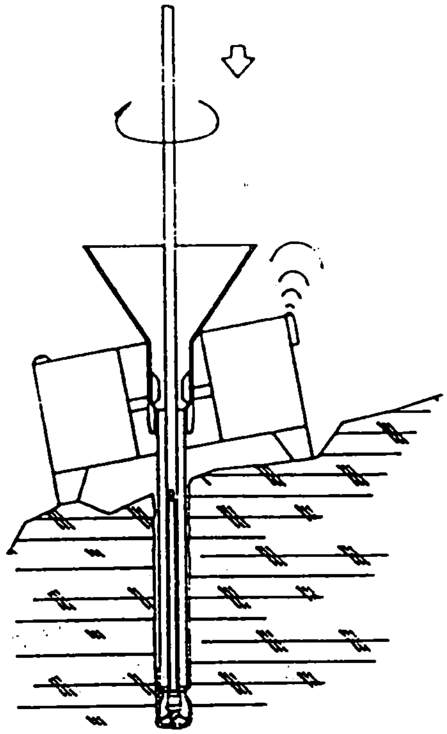
(DCB Followed by DCS)

000382

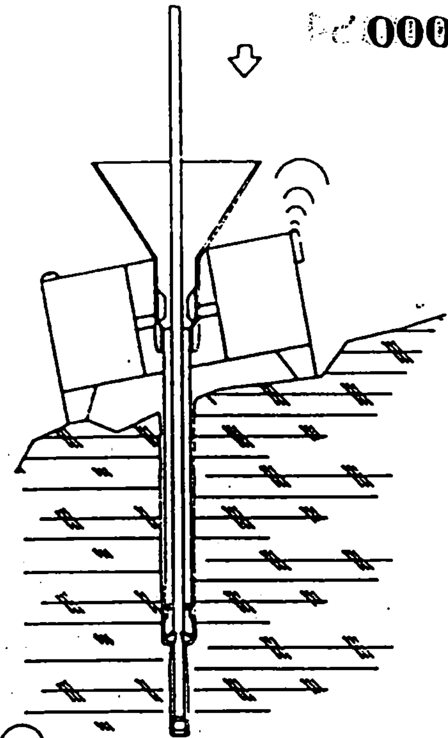


Deployment Scheme for Nested Drill-in-BHA System

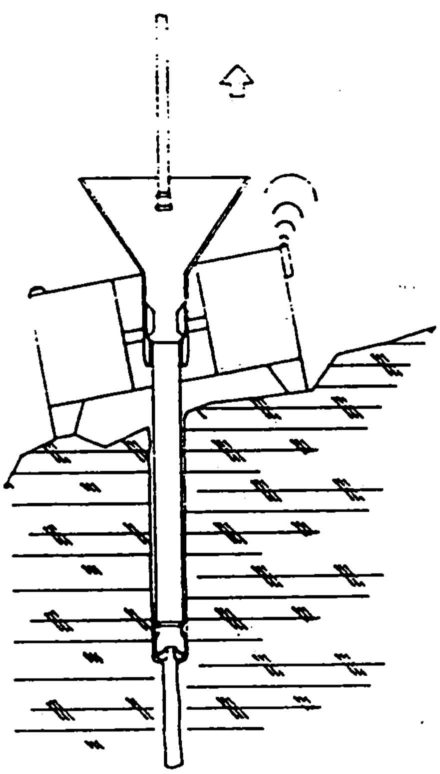
(DCB Followed by DCS)



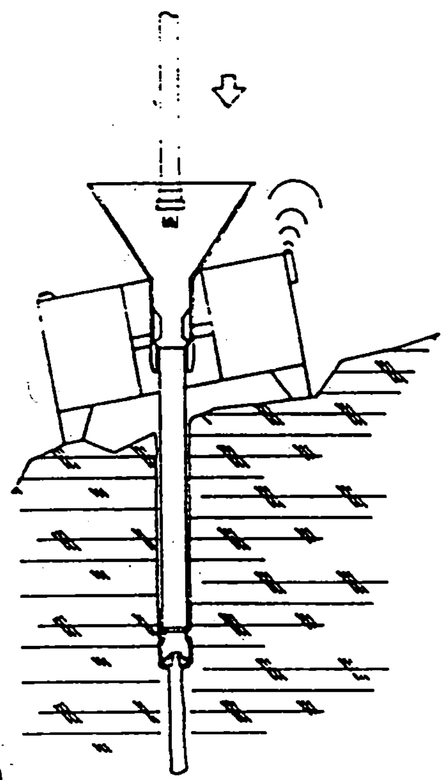
(13) ACTIVATE PRIMARY COMPENSATOR AND BEGIN CORING WITH DCB



(14) CORE WITH DCB TO DETERMINED DEPTH



(15) RETRIEVE DCB ASSEMBLY

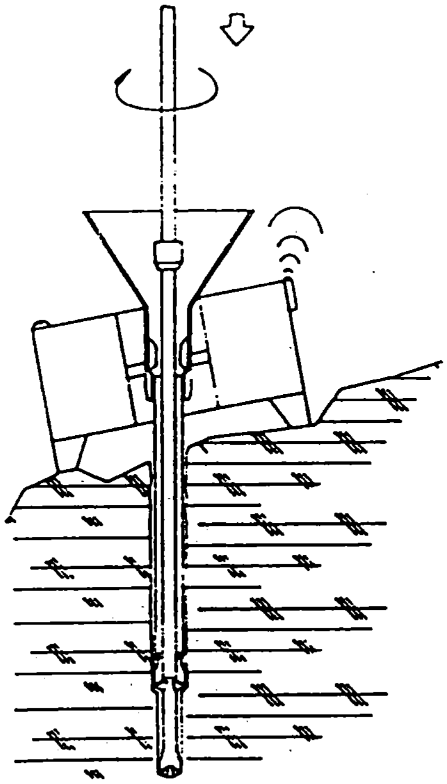


(16) REENTER WITH SECONDARY DI-BHA & CENTER BIT ASSEMBLY

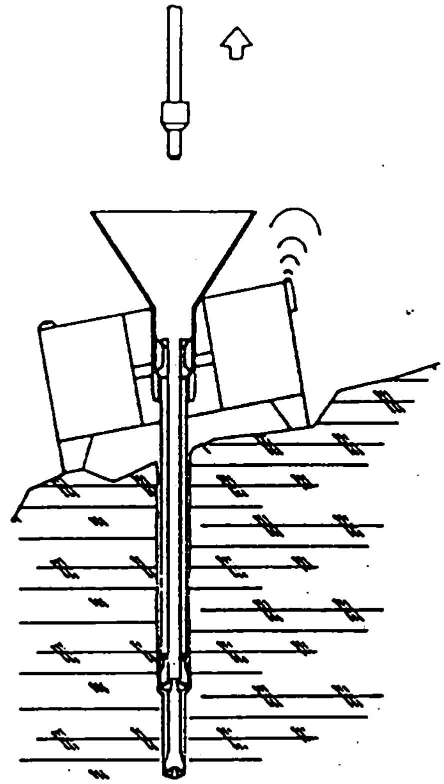
Deployment Scheme for Nested Drill-in-BHA System

(DCB Followed by DCS)

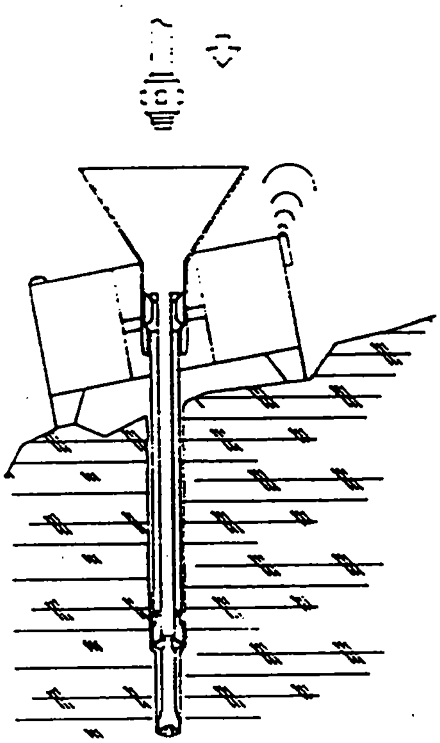
000384



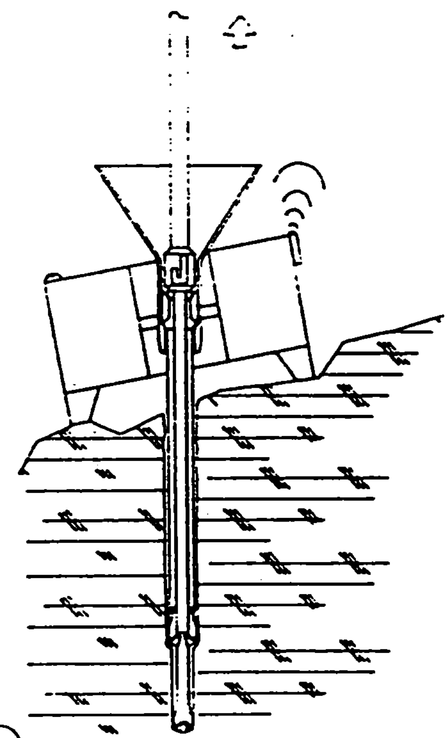
(17) DRILL IN SECONDARY DI-BHA TO PREDETERMINED DEPTH



(18) BACK-OFF SECONDARY DI-BHA AND RETRIEVE STRING



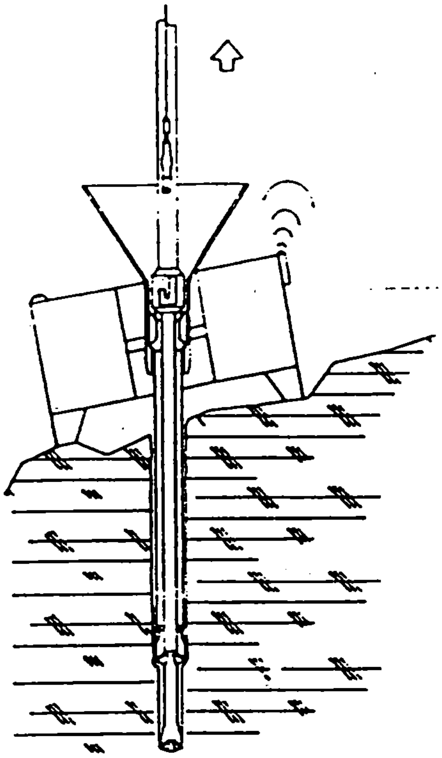
(19) LOWER TENSIONING SUB TO JUST ABOVE HRB



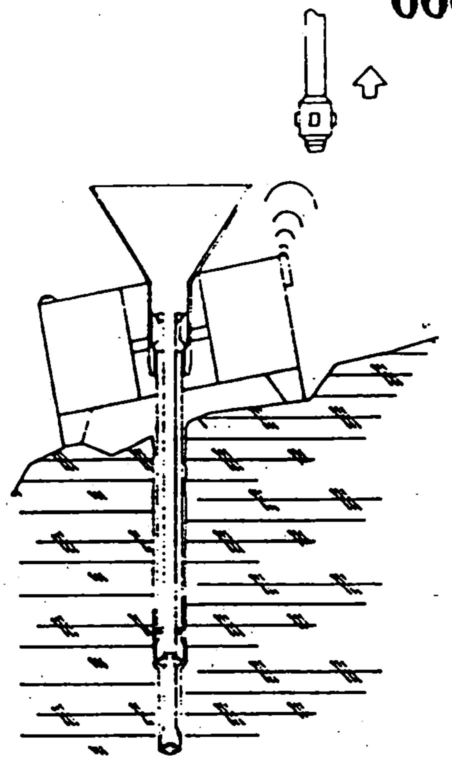
(20) LATCH IN AND TENSION UP MINI HRB

Deployment Scheme for Nested Drill-in-BHA System

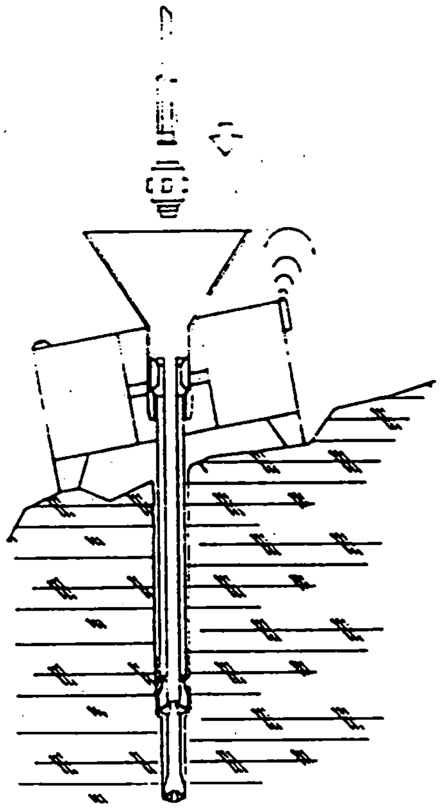
(DCB Followed by DCS)



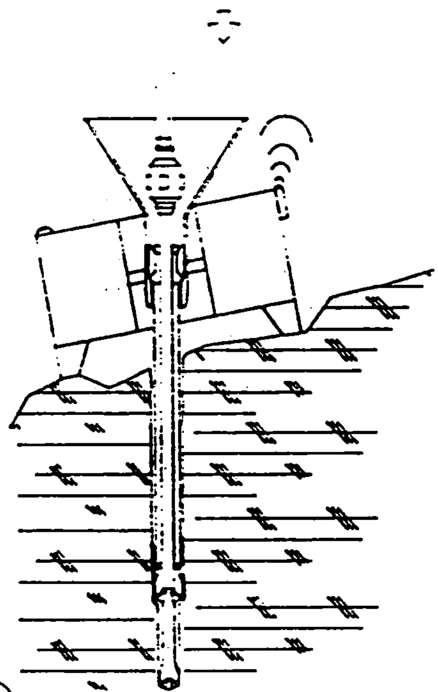
21 RETRIEVE CENTER BIT VIA WIRELINE



22 UN-J AND OFF-SET FROM HRB



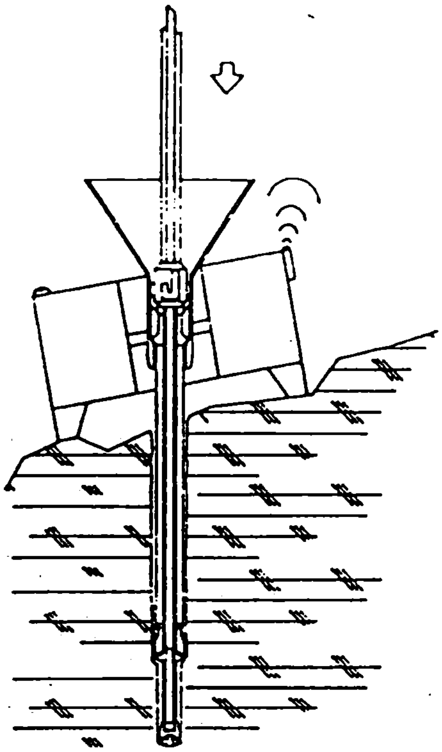
23 TRIP IN DCS TUBING TO JUST ABOVE TENSIONING SUB



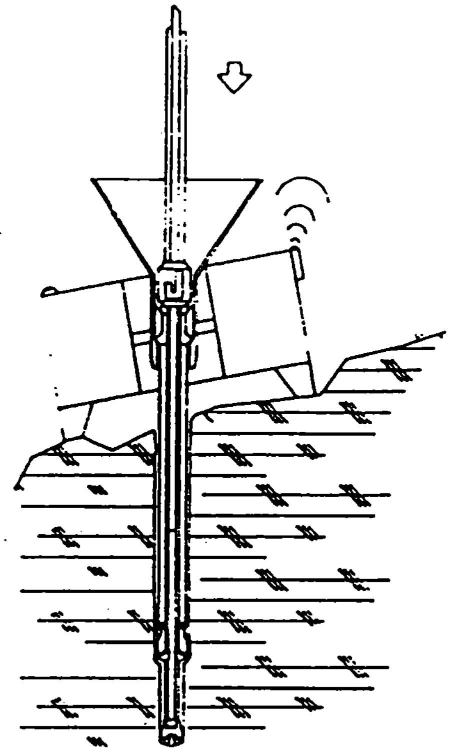
24 REENTER HRB AND TENSION UP

Deployment Scheme for Nested Drill-in-BHA System

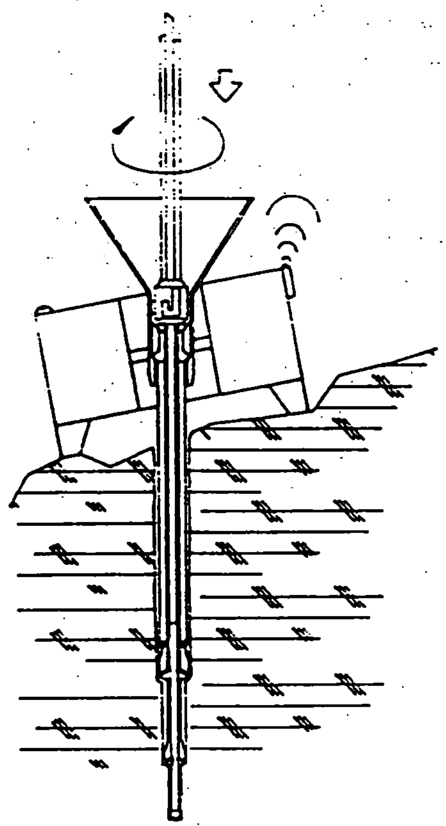
(DCB Followed by DCS)



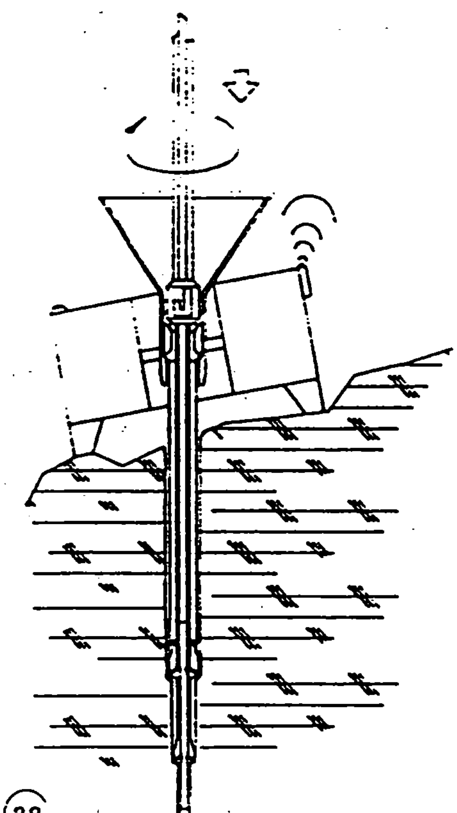
(25) LOWER DCS TUBING TO JUST ABOVE SECONDARY DI-BHA BIT



(26) PUMP DOWN DCS INNER BARREL AND LATCH IN



(27) ACTIVATE DCS SECONDARY COMPENSATOR



(28) BEGIN CORING WITH DCS STRING

Deployment Scheme for Nested Drill-in-BHA System

(DCB Followed by DCS)

APPENDIX B

EXTRACTS OF OPCOM MINUTES
(relevant to TEDCOM)

000388

OPCOM

JOIDES OPPORTUNITY COMMITTEE
7 June, 1991
Joint Oceanographic Institutions, Inc.
Washington, D.C.

EXECUTIVE SUMMARY

1. OPCOM concludes that the most important priority for the "incremental" NSF funding for FY92 (and projected for FY93) is accelerating the development and testing of the DIAMOND CORING SYSTEM. The bottom line for the future scientific success of ODP is that the DCS must work in the range of environments discussed in the LRP. The development should include due attention to the individual components (e.g., development of appropriate bits and core catchers for the relevant lithologies) and the cultivation of necessary expertise (a systems engineering approach to understanding heave compensation approaches, choice of drilling fluids, operator expertise). Testing should include both land and sea tests, with an explicit focus on environments of scientific importance to ODP (e.g., basalts including highly fractured ones, shallow water carbonates, and alternating hard and soft lithologies such as cherts and chalks, including deep water environments). The testing at sea will involve engineering legs on the *JOIDES Resolution* as necessary.

   We anticipate funding these efforts for a total of $1.9M, allocated as $1.675M in FY92 and $0.225M in FY93. This may need to be modified on receipt of results from DCS Phase III Design Studies anticipated in August.

2. Our second priority is logging and fluid sampling development. We recommend the purchase of a logging resistivity tool (FY92) and community input and design feasibility studies on new, more effective approaches to *in situ* fluid sampling.

   We anticipate funding purchase of the resistivity tool for $0.15M in FY92 and funding development of fluid sampling for $0.175M in each of FY92 and FY93.

3. Recognizing the growing importance and potential scientific benefits of the use of alternate platforms, we recommend that JOI, Inc. use the most effective route to commission a feasibility study on alternate platforms for FY92 (or sooner if funds can be rearranged).

   We anticipate funding of $0.1M in FY92 for this item.

4. Of an anticipated $4.2M for FY92 and FY93, this leaves $1.7M unencumbered in FY93. Our first priority for these funds would be allocating resources for the use of alternate platforms, with a priority to augmentation/supplementation of scheduled FY92 and anticipated FY93 programs (explicitly, the Atolls and Guyots Legs and New Jersey Sea Level). We recognize the key importance of support vessels for high-latitude North Atlantic drilling (anticipated $1.3M) and the possibility that this may not be found in SOE or may displace other vital parts of development. These possibilities will need reassessment after hearing ODP/TAMU's priorities for FY93 SOE funds.

5. We also recognize the importance of careful consideration of staffing implications for the above priorities as further development occurs.

Malfait went on to outline constraints under which NSF and JOIDES would be required to handle extra funds: 1) ODP conducts ocean drilling, not continental drilling; 2) ODP must operate within the framework of the MOUs (some activities use comingled funds, others are the responsibility of international partners; JOIDES plans science); 3) NSF will continue to deal through JOI, Inc. as prime contractor; 4) the long-term must be considered, keeping in mind post-1993 uncertainties. NSF would entertain incorporation of additional activities, funded by the extra money, as an amendment to the FY92 Program Plan. EXCOM and BCOM will both require input.

Baker observed that ODP is the only program of which he is aware in which the community gets what it wants. ODP has been lucky so far, but there may be future budget reductions. Austin encouraged OPCOM to promote operations that will yield quick returns, since that might help NSF renew the increment in subsequent years.

INDIVIDUAL PERSPECTIVES

LITHP

Humphris noted that LITHP's long-term objectives require technology developments for drilling and logging. In the short term, technological problems had prevented drilling of Sedimented Ridges II, while the longer-term objectives, including deep drilling, will require improvements in: 1) drilling in highly-fractured volcanics in the upper oceanic crust, 2) penetration rate and bit life, and 3) recovery rate. Offset drilling can be used to achieve some deep objectives in the short term, but improved recovery is still essential.

DCS III will not be operational for about 3 years. Funds are required so that the DCS can be tested as required, by use of an alternate platform. LITHP favors spending on the DCS and slimhole logging tools. DCS development also impacts other panels' LRP objectives, e.g., atoll and continental margin drilling, and riser drilling. Use of the extra funds for DCS III and associated logging would benefit a large part of the ocean drilling community and also affect the long-term success of ODP and achievement of LRP objectives.

Discussion

Brass commented that the DCS was also relevant to paleoceanographic objectives, in particular for the recovery of Paleogene and Mesozoic sediments. Austin recalled that a meeting on the DCS in December 1990 had concluded that $1.6M was needed for DCS II and 3 years and $3M for DCS III. He asked why NSF rejected this spending option at that time. Malfait replied that, at that time, fuel costs were uncertain and also NSF felt that such a plan should have been in the FY91 Program Plan to begin with if it had been considered important. Furthermore, NSF considered the DCS cost estimates questionable.

OHP

Delaney stated that OHP regards the DCS as crucial for the following reasons: 1) it was a COSOD II technology priority, 2) it impacts recent and planned drilling legs (Shatsky and A&G legs would have been more highly ranked if the DCS had been available), and 3) it is essential for recovering chert/chalk and shallow-water carbonates. However, Delaney stressed that chert/chalk may be unique to the deep ocean and, therefore, the DCS should be tested there and not on land or on shallow-water carbonates.

Other OHP ideas for the extra funds were alternate platforms for continental margin drilling, though this was not supported by the whole of OHP, and APC coring in young sediments. Support was widest for the DCS. Quoting I. Premoli-Silva, Delaney added that it "is better to finish things than start new ones".

Discussion

Worthington expressed two concerns: 1) supporting the DCS would be placing all of ODP's eggs in one basket, since it is risky and might not work, and 2) the DCS is a long-term project and will not provide short-term benefits relevant to renewal. Austin commented that, in addition, the extra funding increment might not be long term.

SGPP

McKenzie reported that SGPP had discussed options for use of the extra funds at its recent meeting in conjunction with DMP. She listed SGPP's themes: 1) fluid flux, 2) sea level, 3) metallogenesis, 4) paleocean chemistry, and 5) sedimentary architecture and mass balance. SGPP's interests are, therefore, directed toward processes. Therefore,the DCS came low on SGPP's list of priorities.

SGPP requires fluid sampling capability and *in situ* physical properties measurements instead. In free-flowing fluid environments, recovery of fluids has not been possible. For sampling in pore-water environments, the PCS should be brought to Phase II.

Secondary problems of interest to SGPP are improved recovery of sands and rubbles, and alternate platforms, which are particularly important for the shallow-water section off New Jersey.

Discussion

In response to a question from Malfait, McKenzie said that SGPP's view of the fluids problem involves both the *JOIDES Resolution* and returning to holes later with other vessels. The wireline packer has failed, but a working tool is required. On-site drilling time is the first priority and later monitoring can then be considered. McKenzie added that it had not been possible to recover free-flowing fluid on Leg 133.

Brass observed that an alternate platform is the only idea not already in the system. McKenzie said that drilling in water depths less than 100 m will be required, but Austin noted that the New Jersey sea level program is not a FY92 program and is not even on the schedule. Francis stated that the working minimum water depth for drilling by the *JOIDES Resolution* is 60 m. Millheim and Watkins both supported the alternate platform approach as being innovative and leading to rapid returns. McKenzie pointed out that even projects now in the system are not proceeding continuously. Jarrard agreed, noting that the wireline packer is the subject of a two year moratorium. Worthington added that no further work will be carried out on the packer for two years unless action is taken.

Austin showed the April, 1991, PCOM motion on engineering priorities. Francis recalled that the Gas Hydrates Workshop had recommended shelving PCS II, but McKenzie responded that SGPP had changed its priorities. Francis said that a major redesign, taking at least a year, is required and added that ODP-TAMU was not currently working on the PCS. Brass explained that IDAS is being constructed. It can be taken to sea and will be tested at SIO in June. The system cannot sample at ambient pressure. If it works, he will cooperate with ODP-TAMU to build a core transfer system. Francis pointed out that the VPC is on PCOM's list of engineering priorities, but that the PCS is not. McKenzie agreed, but noted that OPCOM represents a new opportunity. Austin stated that the PCOM motion would have to be modified if OPCOM recommends a particular system. Brass and

Francis cautioned that it might be necessary to hire a new engineer, and Austin agreed that there are staffing implications to every OPCOM decision.

TECP

Moores explained that TECP members had been polled by fax on the issue of additional funds. There was support for maximizing present capabilities, involving 1) deep drilling (many Atlantic objectives), and 2) *in situ* temperature and pressure measurements of fluids (important for studies of accretionary prisms). TECP also supported the DCS, noting that compatible downhole measurements are also needed, including a slimhole televiewer for stress measurements. There was minority support for a hollow, downhole motor drill, and also interest in getting ODP involved in the shallow-water global change program, requiring an alternate platform and numerous holes.

Discussion

Jarrard informed OPCOM that ODP-LDGO had recently acquired a slimhole BHTV. Austin commented that ODP-TAMU engineers believe that deep drilling will require a change in the way the *JOIDES Resolution* is run: being prepared for slower drilling, with casing of holes. The ship is capable of drilling deep holes, but it must be allowed to sit on the sites for long periods. So far, there has been no enthusiasm in the community for this approach, but it will have to be considered for Atlantic drilling.

DMP

Worthington explained DMP's priorities, discussed at its recent meeting. First was development of tools to measure formation resistivity, fluid resistivity and temperature, and high-temperature tools, including slimhole tools. Development could be fast , but much of this is DCS-linked. Second priority was fluid sampling. The wireline packer was a first attempt, but an upcoming meeting in Houston will gather industrial input to consider the best approach. This will require action soon to yield medium-term benefits. Third priority was the MAXIS 500 shipboard data acquisition and processing system, which will accelerate data use, but with a low external profile. Other interests of DMP are downhole susceptibility (not highly-ranked, though it was PCOM's first priority) and the enhanced geochemistry tool.

Worthington added that other tools are in the pipeline and will be coming. DMP has emphasized tools that are not already scheduled and need a push.

HIGH-LATITUDE DRILLING

Brass presented an overview of the geology of the Arctic Ocean, together with the many questions remaining and the problems of drilling and coring in the Arctic environment. An international expedition (*Arctic '91*) is planned to explore the East Arctic Basin. Brass proposed a 40- to 60-day expedition to Alpha Rise and the West Arctic Basin using an icebreaker (US or USSR) and either a French or Canadian long corer. He suggested the possibility of ODP involvement in planning, staffing and curation of cores.

Millheim noted the high cost of industry drilling operations in the Arctic. The use of the ice as a drilling platform was rejected, as the ice is moving too fast. Brass said that only *Arctic '91* will occur unless ODP becomes involved.

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PCOM

Malpas discussed the philisophical approach to dealing with the extra funds. He noted that NSF would like the money to be used for implementation of the LRP, but the option of influencing renewal has also been raised and should be discussed. He added that the latter might not be a good idea. Malpas went on to express concern that ODP often appears to be "reacting to brush fires". The LRP exists and goals have been set. Malpas cautioned against frequent changes of plan and underfunding projects. He then raised the issue of how ODP's success should be judged. The general science population looks for global breakthroughs (e.g., DSDP's confirmation of seafloor spreading). ODP will require technology development and *time* to do this: ODP must get into the mode of spending several legs on one problem. In order to avoid alienating the rest of the community, this approach will require alternate platforms. The extra funds might buy some of the required time.

Regarding technology, the LRP provides the plan and Malpas questioned whether further discussion was necessary. In implementing the LRP, underfunding must be avoided: something must be finished. The DCS has been underfunded, but $2.1M may not be enough to make it work. Furthermore, the VPC might not work even if it is funded. Each phase of the LRP is based on the preceding phases, therefore OPCOM should stick to the LRP implementation plan. Phase I is DCS, deep drilling and high-temperature drilling, while phase II involves alternating soft and hard sediments and oriented core samples.

Lastly, Malpas asked whether ODP should serve itself or the general community. To ensure that the best use is made of the data collected, extra personnel may be required, in addition to time and technology.

Watkins presented the case of alternate platforms for sea-level studies. There are two means of attacking the sea-level problem: A&G and continental margin drilling. ODP's record of recovery in shallow-water carbonates has been poor (~5%). R. Ginsburg achieved ~80% recovery in that lithology using a jack-up rig and diamond coring. The continental margin approach requires a transect, involving shallow-water sites, as does drilling in lagoons. This emphasizes the need for alternate platforms. Watkins noted the presence of a French rig in the Pacific (at Moorea) which might be suitable for atoll drilling. The returns would be rapid. He concluded that alternate platforms should be OPCOM's first priority, with the DCS second.

Discussion

After a brief discussion, follow-up studies to maximize use of existing data were felt to be the responsibilities of individual investigators.

Brass stated that, though an alternate platform would allow testing of the DCS, only a test on the *JOIDES Resolution* would test the heave compensator, which is critical for maintaining weight on bit and producing high recovery. Millheim disagreed, noting that other aspects of the DCS could be usefully tested on an alternate platform, e.g., bit development, core catchers, drilling fluids and operator experience. Motion compensation could be simulated or tested without the drillship. The importance of improved core catchers to enhance recovery, and the SCM to monitor core recovery during drilling, were emphasized.

ODP-TAMU

Francis presented projected costs for various ODP-TAMU projects (Appendix 1). The $780,000 presently allotted to the DCS III in FY92 is insufficient. Studies are being carried out to decide which of two alternative designs to adopt. An additional $1.9M is required for FY92 if DCS III is to have a chance of being ready for Leg 147, though even then, that cannot be guaranteed. Planning for deep drilling will require an additional engineer. ODP-TAMU engineers do not feel that an alternative platform will be very effective for DCS testing, though it might be useful for the VPC. *Bucentaur*, a Norwegian vessel (Appendix 1), costs $30,000/day. An ice support vessel will be needed for a number of NAAG sites, and funds for this cannot be an SOE if deep drilling and DCS costs are also made SOEs. Core lab modifications could await the next dry-docking in FY94.

SMP has noted that the load on the technical staff has increased and recommended an additional 8 technical support positions. The group already suffers from a high turnover rate. A second computer systems manager is essential. Francis also presented costs for an additional development engineer and two marine technicians. Core-log integration has been strongly advocated by SMP and DMP and endorsed by PCOM. It will involve costs for workshops, personnel (2), and hardware and take 3 years.

Discussion

Austin asked what ODP-TAMU's preference would be for spending the additional NSF funds. Francis replied that the priorities would be: 1) to increase DCS III spending in FY92, and 2) to hire a second computer systems manager. Millheim recommended beginning immediately to gain deep drilling experience, but Austin doubted that the community was ready to leave the ship in one place long enough for a really deep hole.

ODP-LDGO

Jarrard distributed a handout (Appendix 2) listing tools that will not be produced without additional funds. The next generation geochemistry tool offers 3 times the number of sensing elements of the present tool. Sediment susceptibility will be an important component of core-log integration, but higher resolution than the present 1.5m is needed. The MAXIS 500 data acquisition/analysis system is not a new tool and is low-profile. It will enable immediate distribution of data to shipboard scientists.

Regarding fluid sampling, problems with the wireline packer are known and can be remedied. However, a 2-year moratorium has begun and some legs will lose out. In related discussion, Francis said that LANL and LBL tools will be taken on Leg 139, but these are still being developed. The Cann-Becker straddle packer system will require ~$30,000 to modify for ODP use, but DMP still has reservations about it.

Jarrard went on to discuss the high-temperature resistivity tool, DMP's highest priority. It is essential for EPR drilling for porosity/permeability measurements (core measurements are not representative in fractured rocks). The aim is to achieve a tool functional up to 350°C. Camborne School of Mines and the BGS are prepared to produce an analog tool by December, though a digital tool would take longer.

No work is being carried out on high-temperature slimhole tools. Cold DCS holes can, however, be logged using ARCO tools.

JOI, INC.

Pyle distributed a handout on alternate platforms.

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GENERAL DISCUSSION

Austin explained that OPCOM must generate recommendations for PCOM, who will then pass them on to JOI, Inc. and NSF. He noted that there are high- and low- budget elements in each of the 5 items of the OPCOM mandate. He felt that OPCOM should recommend something visible and referred to the global proposal prioritization map, adding that OPCOM should feed into FY92 and FY93 planning. This is Phase I of the LRP. Alternate platforms might be for science (leading to questions about how to relate them to ODP, e.g., staffing, publications, etc.), for testing systems, or both. Paleoceanography is being done well, but deep drilling will require changes in the way the *JOIDES Resolution* is run. An alternate platform would assist in this, implying an alternate science platform.

Austin agreed with Malpas that OPCOM must be true to LRP Phase I implementation, at least initially. He felt that OPCOM must reiterate PCOM's stand that the DCS is critical to ODP's success. If all of the extra funds are allocated to the DCS, it will put great pressure on ODP-TAMU to produce a working system. Regarding deep drilling, the capabilities of the *JOIDES Resolution* must first be maximized, necessitating long periods at single sites, with casing, liners and mud. He felt that it would be beneficial to provide the extra $150,000 for the high-temperature resistivity tool. Worthington cautioned against ignoring the large community interested in fluid sampling, which is not represented in the LRP.

Austin informed OPCOM that ONR is interested in contributing money to an alternate platform off New Jersey in 1993. New Jersey sea level is very likely to be on the FY93 schedule, and this would be a good opportunity to bring in another funding agency. He suggested developing plans for 2 cases: 1) $2.1M increment lasts only one year, and 2) the increment lasts for multiple years.

Malpas suggested assuming that the $2.1M increase would last at least 2 years. This is a significant period for DCS development and a significant proportion of the $4.2M should go to DCS III. Use of an alternate platform for science could be considered during periods when the DCS is being tested on the *JOIDES Resolution*. Furthermore, assuming a 2-year increment puts pressure on NSF to ensure that the increment does indeed last 2 years.

Responding to questioning, Francis said that no ship time will be required for DCS III during FY92. Leg 147 would be the earliest possible test of DCS III, and that would require an additional $1.9M to be even a possibility. PCOM would have to consider where to test DCS III if it is not done on Leg 147. Austin noted that PCOM wants the engineering test carried out in an environment of scientific interest.

Austin agreed that OPCOM should present a single plan to PCOM. OPCOM reached the following consensus.

OPCOM Consensus

OPCOM regards the "extra" funds provided to the Ocean Drilling Program as a step increase that is likely to be available for more than one (1992) fiscal year, and that planning for its expenditure be carried out accordingly. In the first instance, PCOM should consider planning for fiscal years 1992 and 1993.

During discussion of the DCS and its testing, Malpas and Brass felt that the *JOIDES Resolution* was the most appropriate test bed, though Millheim pointed out that associated systems (e.g., core catchers, etc.) could be tested separately on an alternate platform.

Francis said that the $1.9M required for the DCS in FY92 is in addition to the $780,000 already budgeted for DCS work. The combined amount is an estimate of the cost of design and construction of DCS III and does not include land testing. He added that testing on the *JOIDES Resolution* will take a leg and some dockyard time. Malpas suggested testing the DCS over 2 years, and that an alternate platform might be used either for science or testing of DCS components before the full DCS test at the end of the 2-year period.

Jarrard noted that $500,000 would enable development of the high-temperature resistivity and fluid sampling tools. There followed discussion of the costs of alternate platforms and whether there would be sufficient funds remaining for such a platform when the DCS and logging tools had been funded. Francis added the $1.3M cost of an ice-support vessel for FY93's NAAG program to the equation. This should have been a SOE, but SOE money had been necessarily spent on underfunded engineering projects. Malfait said that OPCOM should firm up the budget allocations for FY92, while bearing in mind the needs for FY93. It was recognized that the only FY92 program for which an alternate platform might be desirable is A&G, where mobilization/demobilization costs will be high. Watkins and Brass highlighted the need for additional financial support from outside groups, e.g., the French for a Pacific alternate platform, or ONR for one off New Jersey (but only in FY93). Malpas felt that ODP-TAMU should consider cutting engineering projects so that it could focus on the DCS and suggested that Francis bring to the August PCOM meeting a list of potential cuts.

Humphris proposed dropping plans for an alternate platform in FY92 to allow concentration on the DCS. An alternate platform could be considered for FY93. There was support for the idea that an alternate platform is a long-term issue, involving notification of the community, RFPs, the relationship to ODP-TAMU (publications, staffing, etc.) and EXCOM action to be considered.

Malfait pointed out that the real sum under discussion for the 2-year period (FY92 - 93) is the $4.1M NSF increment plus $3.6M in SOEs, yielding a total of $7.8M. There was agreement and Austin added that FY92 SOEs have been set, but FY93 SOE items will have to compete for funds with the ice support vessel. If some or all of the ice support vessel funds come from the SOE, it will leave a more realistic sum for an alternate platform. Malpas and Francis felt that it would be best to decide on FY92 as much as possible, leaving most of the uncertainty to the FY93 budget.

OPCOM felt that more information on alternate platforms was required. Moores and Malpas suggested using A&G and New Jersey programs as case studies. Francis said that a new ODP-TAMU engineer could be hired to perform such a costing study and to work on deep drilling. Millheim suggested using a consultant, H. Zaremba of Durango, Colorado, who had advised R. Ginsburg on his Bahamas drilling project. Moores stated that some of the FY92 increment could be spent on the alternate platform study. There was general agreement that an engineering feasibility study for alternate platforms was necessary.

Francis felt that an additional ODP-TAMU engineer might be required to define the job and interact with the consultant. Millheim, however, said that the consultant would only require basic information. Austin said that money for the study would be required in FY91. Pyle responded that there was none available. Millheim, however, said that the timing was negotiable. Austin said that a report from the consultant will be required at the PCOM Annual Meeting. Millheim said that he would contact the consultant.

Brass suggested that alternate platforms be used as extensions to existing programs. Austin, however, responded that planning will have to be more open. RFPs should be issued in the fall so that panels can rank proposals in the spring. He added that this should be discussed by PCOM at its August meeting.

Delaney prepared a summary of OPCOM's conclusions for approval by OPCOM as a consensus. Austin raised the issue of staffing, asking whether it should be discussed at this meeting, or following the report of the alternate platform study. Francis said that some of the $1.9M could go to staffing, instead of subcontractors. Design reports on the two versions of DCS III under consideration should be available in August. Austin directed Delaney to include a note on staffing in her consensus, adding that the meeting on fluids sampling should also consider staffing.

Austin outlined the following sequence of events:

June	OPCOM I
August	DCS III studies (if available)
	Fluid sampling expert meeting
	PCOM
Before October 1	Initiation of alternate platform feasibility study.

OPCOM might meet again after the reports are completed to place alternate platforms and downhole measurements into a form that could be incorporated into FY93 planning. A second meeting would be held some time between October 1 and the PCOM Annual Meeting, perhaps the day before the PANCHM meeting. OPCOM approved the following consensus.

<u>OPCOM Consensus</u>

1. OPCOM concludes that the most important priority for the "incremental" NSF funding for FY92 (and projected for FY93) is accelerating the development and testing of the DIAMOND CORING SYSTEM. The bottom line for the future scientific success of ODP is that the DCS <u>must</u> work in the range of environments discussed in the LRP. The development should include due attention to the individual components (e.g., development of appropriate bits and core catchers for the relevant lithologies) and the cultivation of necessary expertise (a systems engineering approach to understanding heave compensation approaches, choice of drilling fluids, operator expertise). Testing should include both land and sea tests, with an explicit focus on environments of scientific importance to ODP (e.g., basalts including highly fractured ones, shallow water carbonates, and alternating hard and soft lithologies such as cherts and chalks, including deep water environments). The testing at sea will involve engineering legs on the *JOIDES Resolution* as necessary.

We anticipate funding these efforts for a total of $1.9M, allocated as $1.675M in FY92 and $0.225M in FY93. This may need to be modified on receipt of results from DCS Phase III Design Studies anticipated in August.

2. Our second priority is logging and fluid sampling development. We recommend the purchase of a logging resistivity tool (FY92) and community input and design feasibility studies on new, more effective approaches to *in situ* fluid sampling.

We anticipate funding purchase of the resistivity tool for \$0.15M in FY92 and funding development of fluid sampling for \$0.175M in each of FY92 and FY93.

3. Recognizing the growing importance and potential scientific benefits of the use of alternate platforms, we recommend that JOI, Inc. use the most effective route to commission a feasibility study on alternate platforms for FY92 (or sooner if funds can be rearranged).

   We anticipate funding of \$0.1M in FY92 for this item.

4. Of an anticipated \$4.2M for FY92 and FY93, this leaves \$1.7M unencumbered in FY93. Our first priority for these funds would be allocating resources for the use of alternate platforms, with a priority to augmentation/supplementation of scheduled FY92 and anticipated FY93 programs (explicitly, the Atolls and Guyots Legs and New Jersey Sea Level). We recognize the key importance of support vessels for high-latitude North Atlantic drilling (anticipated \$1.3M) and the possibility that this may not be found in SOE or may displace other vital parts of development. These possibilities will need reassessment after hearing ODP/TAMU's priorities for FY93 SOE funds.

5. We also recognize the importance of careful consideration of staffing implications for the above priorities as further development occurs.

ADJOURNMENT

The meeting was adjourned at 4:40 PM.

APPENDICES ATTACHED TO THE 7 JUNE, 1991 OPCOM MEETING

1. Science Operator report, supplemental information
2. Wireline Logging report, supplemental information

HANDOUTS DISTRIBUTED AT THE 7 JUNE OPCOM MEETING

1. JOI, Inc. memo on alternate platform options

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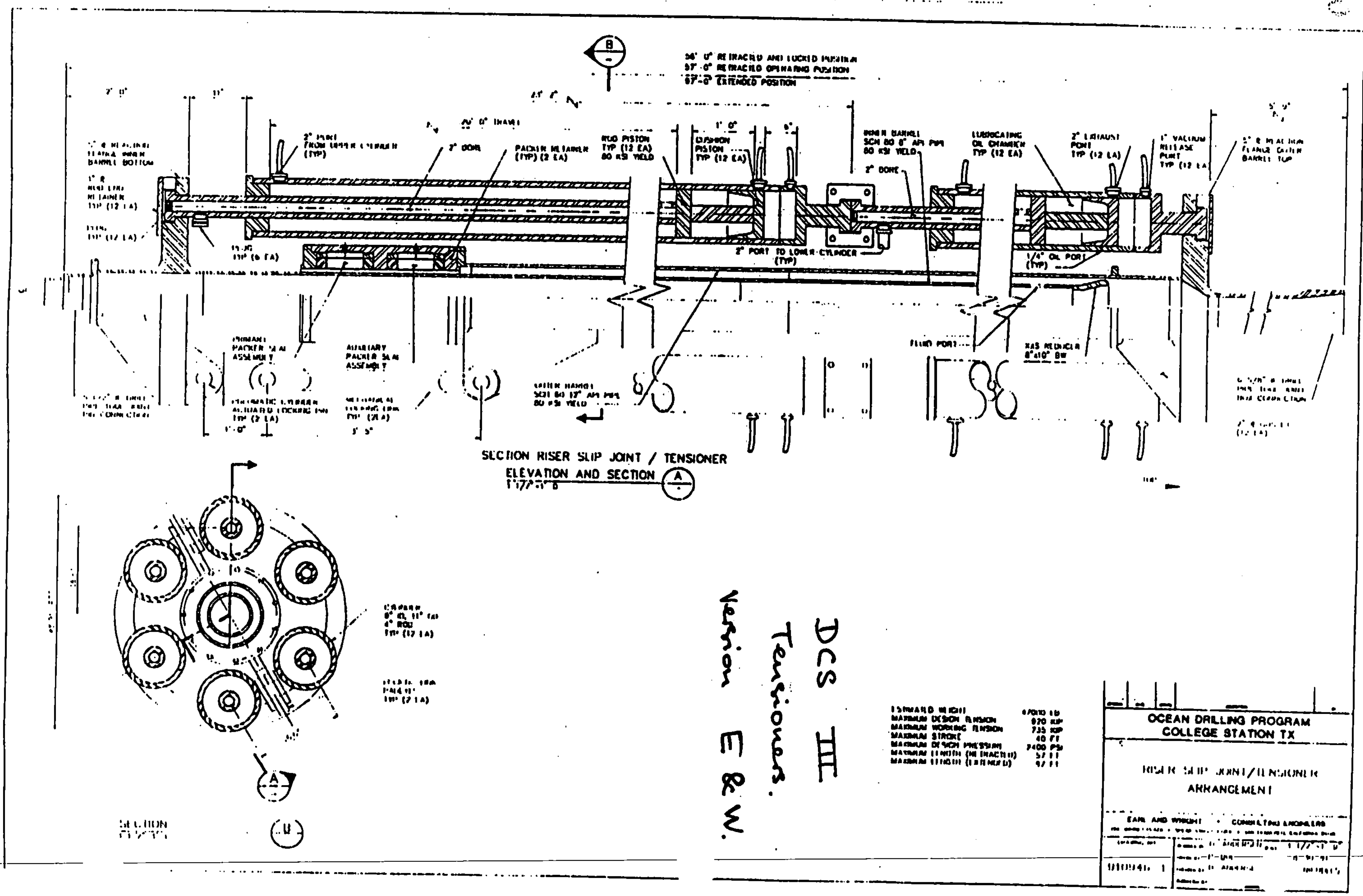
APPENDIX C

DCS PHASE III
(Earl & Wright)

000400



DCS III
Tensioners.
Version E & W.

APPENDIX D

DEEPDRILLING DATA FROM TECP, LITHP, SGPP

000402

TECP

①

ODP PROPOSAL : SITE SUMMARY FORM

(Submit 10 copies of proposal)

Proposed Site: NB3

General Area: Northern Newfoundland Basin

Position (Lat./Long.): 44°27'N, 46°55'W

Alternate Site: NB6

General Objective: Rift-system (passive-margin) evolution

Thematic Panel Interest: All

Specific Objectives: Drill into fault block to test for continental crust and to examine age/nature of syn-rift sequence; date the "U" or breakup unconformity; examine subsidence history; deep stratigraphic test hole for post-Aptian sedimentary and paleoceanographic history.

Background Information (Indicate status of data as outlined in the guidelines):

1- Regional Geophysical Data:
Seismic Profiles: CONRAD 25-10 MCS grid (primary data); miscellaneous industry MCS (available via COGLA); miscellaneous academic SCS availab

Other Data: Magnetics, gravity, SeaBeam, 3.5 kHz, 12 kHz

2- Site Survey Specific Data:
Seismic Profiles: No site-specific surveys exist at this time.

Other Data:

Operational Considerations:

Water Depth (m): 3949m **Sedi.Thickness (m):** ca. 2060m to "U" **Total Penetration (m):** ca.2300

HPC: **Double HPC:** **Rotary Drill:** X **Single Bit:** **Reentry:** X

Logging: Standard package.

Nature of Sediments: Terrigeneous to hemipelagic.
Rocks anticipated: Basement rocks presumably are continental, possibly with volcanics

Weather Conditions:
Windows:

Territorial Jurisdiction: International waters 180 km (100 n.mi.) from Grand Banks, 550 km (300 n.mi.) from Newfoundland.

Other:

Special Requirements (staffing,instrumentation,etc.): None at this time.

Proponent (address,phone & electr. mail)

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TEC? 2.

000403

NB-3

3949 m	Water
2060 m	hemipelagic silty clay fine grained shale
200 m	sandstone/fine conglomerate/volcanics/black shale possibly limestone with or without chert
40 m	Continental basement/Paleozoic metamorphics

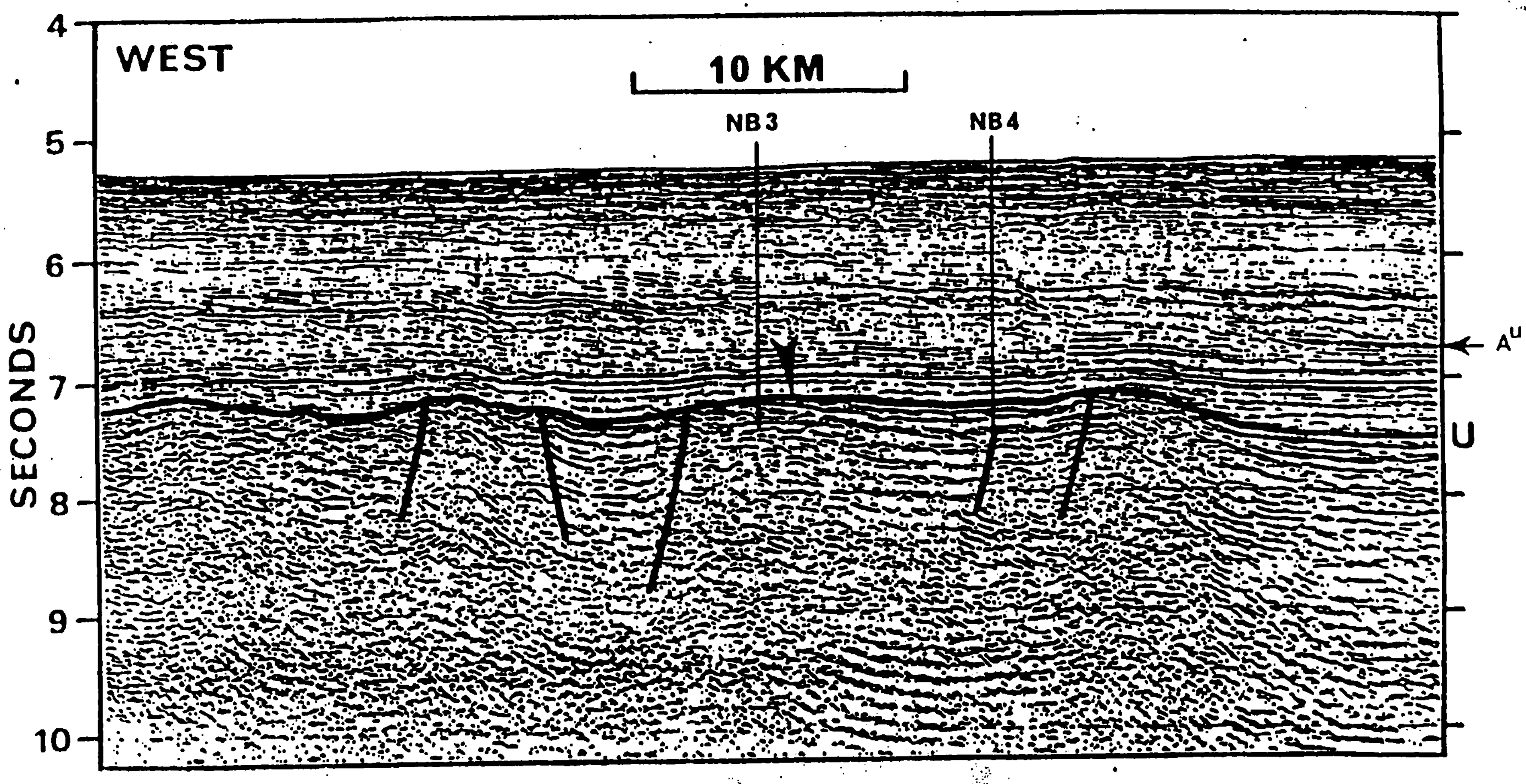


Figure G1.6 Interpreted MCS profile across proposed drillsites NB3 and NB4. Arrow points to reflectors that are truncated by U along top of basement block.

000404

LITHP.

DEEP DRILLING IN OCEAN CRUST

Drilling depth:	6 km
Water depth:	4-4.5 km
Sediment:	variable thickness - 0-300 m no hydrocarbons
Temperatures:	dependent on age

ıproximate Depths	Lithology	Structures	Permeability	Potential Drilling Problems
(?) km	Pillow basalts	Complex association of intercalated pillow lavas, pillow breccias, hyaloclastites, and thin flows. Sulfide stockworks possible at pillow-dike transition.	Approx. 10^{-14} m^2 in upper 200-300 m Approx. 10^{-16} m^2	Brittle, fractured, void-filled crust at shallow depths. Possible severe hole stability problems related to collapse of weak materials, except where substantial alteration infilling has cemented the materials. Older crust should allow higher recovery and better drilling conditions. Stress-induced failure not a problem, except towards the base of the zone. Large hole size variations at shallow depths may result in difficulties removing cuttings, and high permeabilities in isolated zones may result in substantial lost circulation.
Km	Sheeted dikes	Massive basalts and dikes with no flows. 10-15% fracture-controlled alteration to greenschist facies. Epidote-quartz alteration in lower section possible. High angle and low angle shear zones of differing properties.	5-20 x 10^{-18} m^2	Fewer voids, and less fracturing except in isolated zones, for example, where faults are encountered. Higher stresses may result in wellbore failure. HIgh angle structures (dike margins, etc.) could contribute to or cause sloughing of the wall into the wellbore. Repeated temperature cycling of the wall rock, due to cooling by drilling fluids and recovery when circulation stops may induce further instability. Epidote-quartz assemblages much harder and could be more difficult to drill.
km	Gabbros	Massive gabbros and meta-gabbros with varying degrees of plastic and britle deformation--some with well-developed foliations. Alteration as replacement textures and vein fillings	Low permeability? Highly variable.	Unknown, except higher stresses and worse temperature problems. Based on 735B, we may have relatively smooth drilling and high recovery, as the rock may be less brittle and have fewer fractures. The more altered the easier the drilling.
km	Dunite/ peridotite	Massive dunites and peridotites, some deforma-tion, and varying degrees of alteration?	Low permeability?	Still worse stress/temperature problems. Unknown conditions otherwise. Again, the more altered the easier the drilling.

000405

LITHP.

[redacted]

ODP proposal no. 061

SGPP.

ODP PROPOSAL

THE CONJUGATE PASSIVE RIFTED MARGINS

OF

MADAGASCAR AND EAST AFRICA,

AND

THE WESTERN SOMALI BASIN,

INDIAN OCEAN

Millard F. Coffin
Lamont-Doherty Geolcgical Observatory
Columbia University
Palisades, New York 10964

The passive margins bordering the Western Somali Basin of the Indian
'cean provide an unparalleled opportunity to investigate both conjugate sheared
ind conjugate rifted margins in a constrained geographical area and to solve
mportant problems of margin evolution. Both types found there are among the
ldest extant in situ margins on the surface of the Earth; subsequent to their
ormation the African margins have been affected by the recent phase of East
frican rifting while the Madagascan margins have been unscathed by any sig-
ificant tectonic activity. Furthermore the opening of the Western Somali
asin marked the initiation of the present-day Indian Ocean, and the deepest
ediments of the basin chronicle the evolution of a nascent Jurassic ocean and
rovide a window into the history of Tethys.

The margins of East Africa, and the oceanic crust created by the se-
aration of Madagascar and Africa have recently been the focus of comprehensive
arine geophysical research (Coffin and Rabinowitz, 1982, 1983; Rabinowitz,
offin and Falvey, 1982, 1983; several works by the same authors in preparation).
alient scientific results from these studies include: the dating of oceanic
rust in the Western Somali Basin from marine magnetic anomalies as between
65 and 120 Ma; the discovery of diapir provinces on the rifted margins of
ast Africa and Madagascar; the characterization of the crust of the basin as
eismically oceanic, yet thinner than normal; and the establishment of a seismic
tratigraphic sequence for the East African margin. Seismic stratigraphic
tudies indicate diapirism continuing into the Miocene and possible Pliocene,
massive sediment slide occurring in the Eocene and an abyssal channel net-
ork created in Mid-Miocene time.

Figure 1 defines the acoustic stratigraphy control for the basin,
xcluding industry data offshore Kenya and Madagascar. To date the only deep-
ater drillsite pertinent to studying the origin and evolution of the passive

SG99

rifted margins is DSDP 241, which penetrated 1174 m of an approximately 4200 m thick sedimentary section into lowermost Turonian sediments, and from which 136.7 m of sediment were recovered. The correlation of this drillsite with multichannel seismic data is given in Figure 2. The limitations of this hole are readily apparent: it penetrated only ¼ of the total sediment thickness and ½ of the time represented by the sedimentary section, and the recovery rate was a meager 12%. The proposed drilling program consists of sites a through e in Figure 3. DSDP holes and relevant industry holes (MAR1 and SIM1) are also shown. A summary of each proposed site is provided on the standard ODP form, and a seismic line accompanies each site.

Overall the drilling program proposes to attack problems of passive margin development. Through examining the Cenozoic sedimentary records from conjugate margins, the ambiguity in seismic stratigraphy resulting from mixed signals of sea level and tectonic subsidence may be resolved. The imprint of renewed tectonism on passive margins is certainly present in the offshore Cenozoic East African sedimentary sequence, and may elucidate the process of re-rifting of ancient margins, e.g. Iapetus. Deformation of sediments by gravity sliding and diapirism has been observed on many passive margins, yet the processes remain poorly-understood. The nature and dynamics of abyssal channel formation suffer from a similar lack of knowledge. Finally an adequate study of the seismic stratigraphy of these margins requires well control, which is now lacking. Outside the realm of passive margin evolution, the drilling program offers to date magnetic anomaly M12, obtain a Mesozoic section recording the evolution of a nascent ocean basin and of southern Tethys, and provide information on Cenozoic paleoceanography.

Two sites MD-a and MD-b, coupled with MAR1 (Figure 3) comprise a ransect of the rifted margin of northern Madagascar. Site MD-a (2700 m ater depth) should establish a low latitude, mid-rise Cenozoic sedimentary sequence useful in subsidence, sea level and deformation studies. Site D-b (1875 m water depth), upslope and across a deformation front from D-a, would penetrate a deformed zone of presumably the same sedimentary ection as MD-a. The object of the hole is to decipher the nature of the eformation, i.e. its resulting from gravity, diapirism, or some other factor. uch deformation commonly occurs on mature passive margins and is poorly nderstood. A packer and borehole televiewer would be required.

Site WSB-c (4885 m water depth) would penetrate the igneous crust t anomaly M12. In addition to providing a sorely-needed date for the Mesozoic agnetic sequence and providing an age for the Western Somali Basin, the stra- igraphy of the hole would provide the first information on much of the Mesozoic volution of the embryonic Indian Ocean, a probable branch of Tethys. The am- iguous "red" reflector of Figure 2 would be sampled, as would the correlative onformities of the "purple" and "green" reflectors. Similarly Site SM-d (4370 water depth) would tie into multichannel seismic data collected in 1980, and ould penetrate through the "green" and "purple" (décollement surface, age ncertain) reflectors, thus providing late Cretaceous and Tertiary stratigraphy. mid-Miocene event resulting in the formation of abyssal channels would also e a focus of scrutiny in the two sites. Site SM-d is situated in the axis of modern-day abyssal channel, and may offer insight into downslope sediment ynamics from its upper sedimentary section.

Site SM-e (2440 m water depth) is located on top of a diapir ex- ibiting many characteristics of halokinesis. A packer would be necessary for ollecting fluid samples above the diapir. The confirmation or denial of the presence of salt on the conjugate rift margins of East Africa and Madagascar has important bearing on the paleoenvironment of the early Indian Ocean. Much of the Cenozoic section should be present above the piercement structure, and the mid-Miocene event and "green" reflector should be present. Since this site is in roughly the same water depth as MD-a, comparisons of margin subsidence and/or uplift, sea level, and paleoenvironment for the conjugate rifted margins (one at the edge of recent tectonism and subjected to major sediment influxes, the other relatively stable since its origin) could allow deconvolution of the sea level and subsidence factors and shed light on seismic stratigraphy and margin evolution.

All five of the proposed sites have potential paleoceanographic significance. The low latitude Indian Ocean is rather poorly understood; bottom water flows energetically through the Amirante Passage into the Western Somali Basin and/or the Comoros Basin, but the history of this circulation and its path beyond the passage are mysteries. Ignorance concerning the development and history of the vigorous monsoonal currents and countercurrents in the upper water column along the margins of East Africa and Madagascar is also profound.

In summary the proposed drilling program offers potential resolution of a number of tectonic and sedimentary enigmas, including margin evolution, subsidence, sea level changes, the effects of renewed tectonism on passive rifted margins, the nature of deformation on passive margins, the paleoenvironment and development of a nascent ocean basin, an *in situ* sedimentary history of Tethys, the dating of magnetic anomaly M12, and consequently the age of some of the oldest Indian Ocean crust. When combined with a shorter drilling program entitled, "The Davie Fracture Zone: A Transect across the Conjugate Passive Transform Margins of Mozambique and Madagascar, Indian Ocean," valuable analyses of conjugate sheared and conjugate rifted margin origin and evolution may be undertaken.

investigations.

000411 SG??

:: Western Somali Basin
°10'E, 3°28'S
te: according to site survey

Thematic Panel interest: TP, SOHP
Regional Panel interest: IOP

ectives: Obtain Mesozoic and Cenozoic stratigraphic section for the Western Somali Basin, a probable remnant of Tethys. Date Mesozoic magnetic anomaly M12, and thus Western Somali Basin. Sample "red" reflector, possibly correlative conformities of "purple" and "green" horizons. Investigate mid-Miocene event.

Information:

ata:

rofiles: VEMA 3619 seismic profile @ 1330, 29 December 1980

a:

Data - Conducted by: none at present

its:

Considerations

:: (m) 4880 Sed. Thickness: (m) 1500 Total penetration: (m) 1510

Double HPC ____ Rotary Drill X Single Bit X Reentry ____

diments/rock anticipated: calcareous pelagics, distal turbidites

ditions/window:

urisdiction:

ng probably required

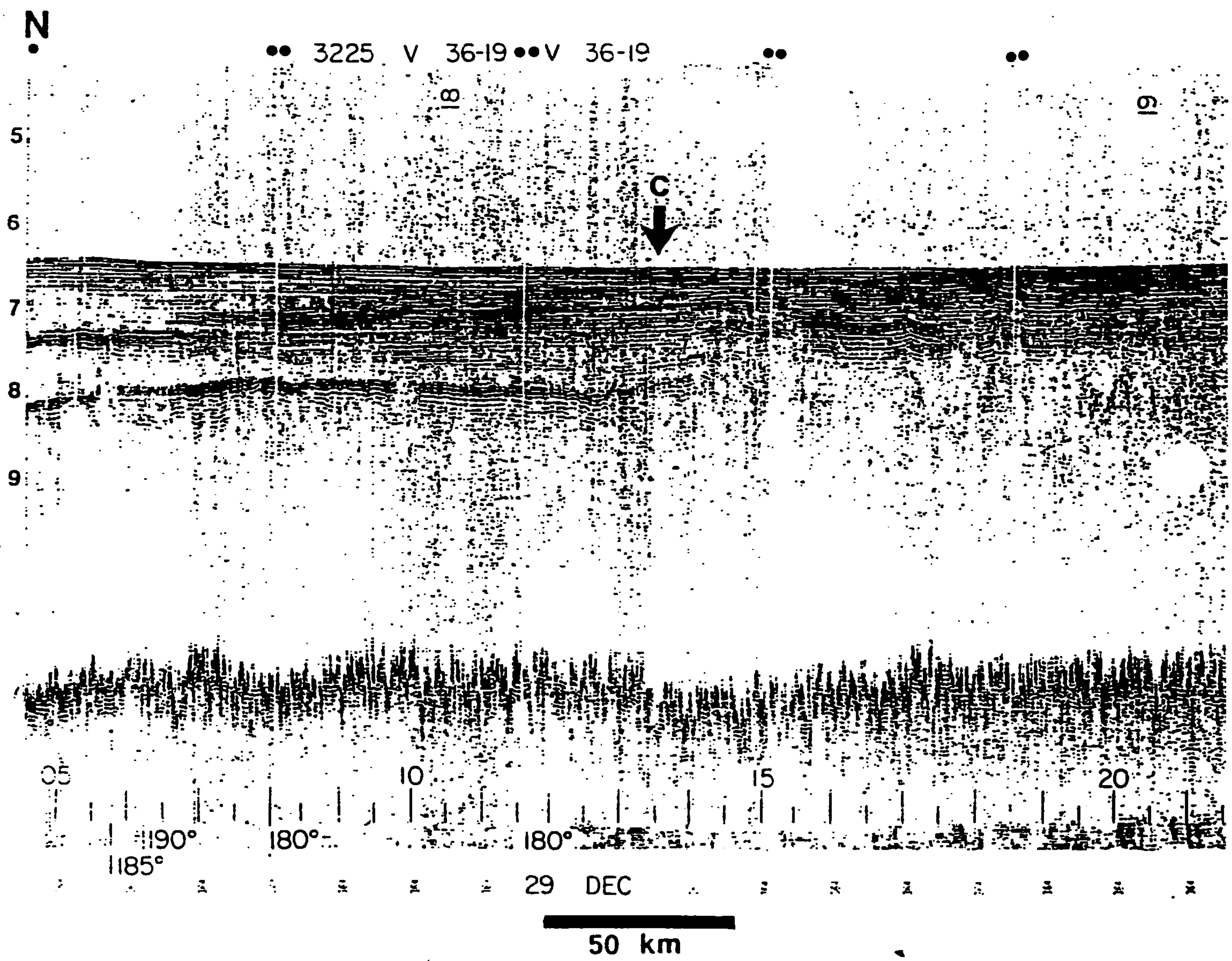
rements (Staffing, instrumentation, etc.)

M. F. Coffin
Lamont-Doherty

P. Matthias
Texas A & M

Date submitted to JOIDES Office:

SGPP


N
3225 V 36-19 V 36-19
18
19
5
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9
C
05
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20
1190°
180°
180°
1185°
29 DEC
50 km

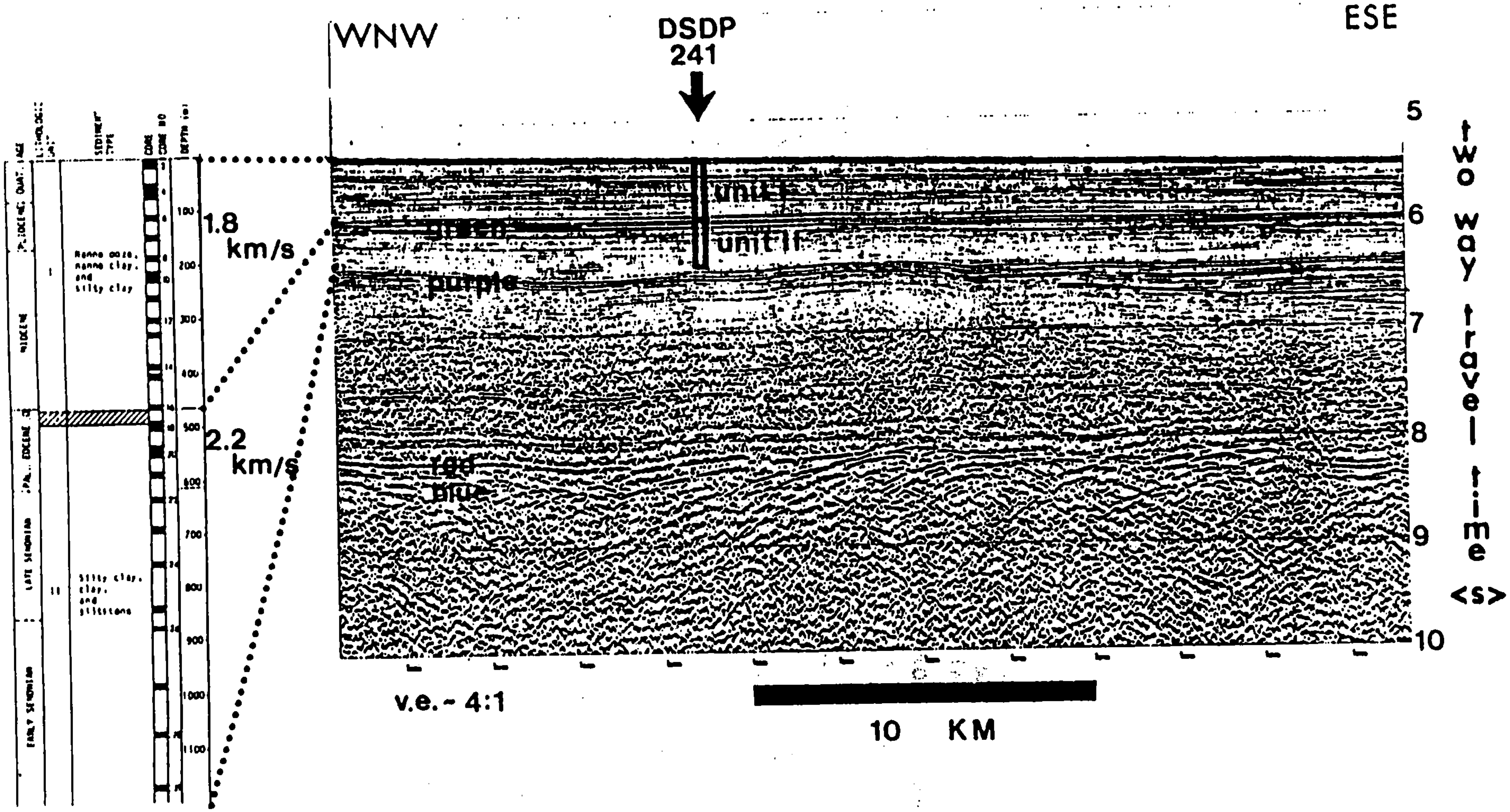


Fig. 2 Correlation of 12-fold stacked seismic reflection profile with results of DSDP site 241. The middle Eocene-Late Oligocene hiatus between lithologic Units 1 and II coincide well with the "green" reflector. Drilling in Unit II did not penetrate the "purple" reflector to which we have assigned a mid-Cretaceous age

000413

000414

SG??

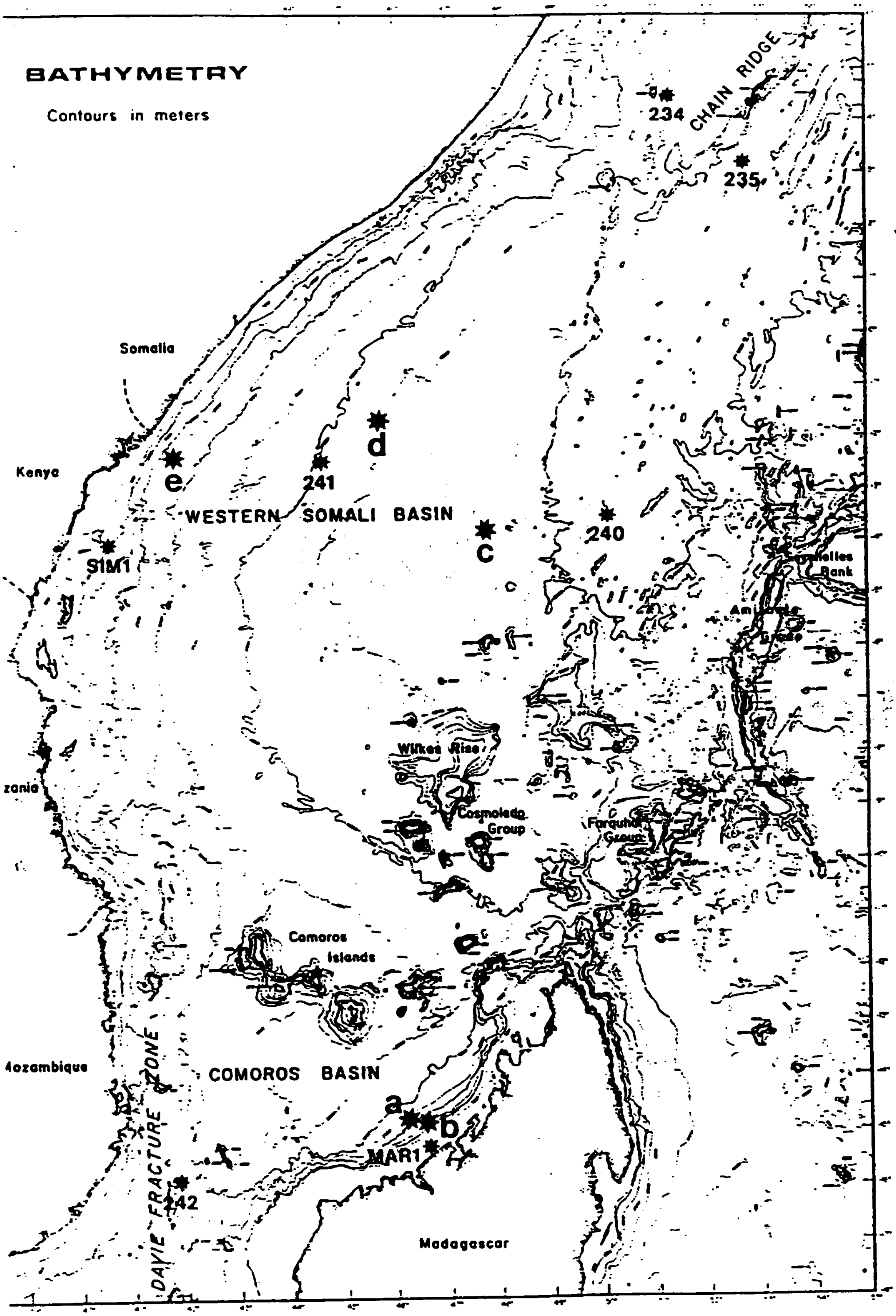


Figure 3. Proposed drillsites, DSDP sites, and industry wells.

Site data. SGPP.

000415

Deep hole in Western Somali Basin through sediment and into basement

Water depth: approx. 5000m

Sediment thickness: 1500-2000 m

Sediment type: calcareous pelagics and distal turbidites

Total drillstring length: 6500-7000m

000416

APPENDIX E

TAMU DEEPDRILLING STUDY

000418

OCEAN DRILLING PROGRAM
DEEP DRILLING TASK FORCE
REPORT ON CURRENT CAPABILITIES

Aug 3, '91

INTRODUCTION:

The Ocean Drilling Program (using the Sedco/BP 471 and ODP's current drill string and coring equipment) can drill and core to 8230 m (27,000') total depth (water and penetration) in fair weather and operating conditions provided hole temperatures do not exceed 250°C (482°F). Present equipment or off-the-shelf equipment adapted from deep-hot oil field, geothermal and mining technology can be used to extend the temperature limit to 300°C (570°F). Time, budgetary considerations, technology and the experience gained in ODP's initial deep drilling attempts will determine the range of conditions (locations) accessable through further engineering development of drilling and coring equipment (designed for special conditions such as young highly stressed rock and geothermal temperatures of 400°C (752°F)).

Deep drilling is inherently slower because of reduced rate of penetration (Attachment 1, Hole 540B progress), longer trip times (Attachment 2, trip time graph), shorter bit life and increasing problems with long open hole sections and tool failure. The time and money investment in a deep hole requires a change in operating philosophy and a commitment to accept slow progress with hole problems and fishing jobs, and a greater chance of failure. Contingency should be built into the hole plan, which requires the drilling of large diameter holes for expensive long, large diameter casing strings.

The purpose of this report is:

a) To evaluate factors involved in a 2000-3000 m penetration of the ocean crust in 2000-3500 m water depths at locations similar to Hole 504B, Cascadia, and the East Pacific Rise,
b) To propose how such a deep penetration might be accomplished soon (tentatively scheduled for 1993) using existing equipment and technology, and
c) To identify potential equipment and operating problems that should be investigated to improve success in coring deeper holes.

RECOMMENDATIONS:

1) A 2000-3000 m penetration of the ocean crust could be accomplished in 2000-3500 m water depth using current drilling and coring equipment and technology if the site selected is scheduled in the most favorable weather window in an area of mild weather, has stable current less than one knot, has less than 500 m of stable sediment overlying competent or well cemented basalt, and has reasonable access to shore support facilities.

2) An APC/XCB hole (Hole A) would be cored through the sediment cover. An RCB hole (Hole B) would be cored 200 m into the basalt (through the unstable basalt) to allow geological evaluation and coring, sampling and logging requirements to be met. Attachment 3 is a schematic of Hole 504B, and proposed deep Holes A, B and C (with triple and double casing hanger options). NOTE: These generic proposals were based on Hole 504B conditions for illustrative purposes in lieu of a specific proposed site.

3) After confirming that the site was acceptable geologically and stable operationally, a larger diameter "Deep Hole" (Hole C) would be drilled, cased and cored as follows:

a) A Triple Casing Hanger / Re-Entry Cone System would be used to wash 20" casing down to about 80 mbsf (into firm sediments).
b) An 18-1/2" hole would be drilled about 200 m into basement (through the unstable extrusive basalts to 475 to 700 mbsf).
c) A 16" casing would be set and cemented.
d) A 9-7/8" RCB hole would be cored as deep as possible (or to about 1500 mbsf), logs would be run, and the hole would be opened to 14-3/4".
e) A 13-3/8" casing string would be set to secure the hole.
f) Coring would continue with the 9-7/8" RCB system as long as possible.
g) If required by unstable hole conditions, a contingency casing liner could be hung (11-3/4" liner in 13-3/8" casing), and the hole could be continued with a conventional 9-7/8" RCB system.
h) If required again by hole conditions, another contingency liner could be hung in the first liner (8-7/8" liner in 11-3/4" liner), and the hole continued with a 6-1/4" downhole motor or modified Diamond Coring System (DCS).

POTENTIAL PROBLEMS:

ODP's limited knowledge of the potential problems related to deep oceanic crustal coring has come primarily from Hole 504B experience (1.6 km penetration). The environmental and operational problems related to deep marine coring are somewhat unique to ODP's operations (no mud, riser or returns to the surface); however, Hole 504B experience can be augmented by continental deep drilling knowledge gained at sites such as Cajon Pass, Ca.(3.5 km), the Russian Kola Peninsula hole (12.0 km), the German KTB project (projected 10 to 12 km), the Swedish Siljan Ring project (6.3 km) and deep gas producing wells in the USA, such as the Bertha Rogers, Ok. (9.7 km). For the initial deep oceanic crustal penetration, careful site selection may eliminate the most extreme geological problems, but some common deep drilling problems must be dealt with to insure the success of the project and meet scientific requirements.

1) Hole Instability :

A) Pelagic sediment sections usually begin to become firm below 80 mbsf; therefore, the first casing string would be washed to about 80 to 100 mbsf (to anchor the ReEntry Cone and case off the soft, unstable upper sediments). To improve the chances for setting the second casing string through the upper (+/-200 m) section of unstable basalt section, total sediment thickness should be less than 500 m.

B) Unstable upper sections of young rapidly cooled extrusive basalt (mostly round pillow lava boulders with brittle, fractured, glassy rinds) tend to be mechanically unstable, and the boulders fall into the hole (which traps the drill string), leaves hard ledges on which tool joint shoulders hang-up, or leaves soft ledges in which the drill string wears grooves "keyseats" and hangs-up. Periodic rereaming (about every 24 hours during a short trip in Hole 504B) has helped to dislodge unstable sections and break-off ledges before they cause problems.

C) Associated volcanic sands, gravels, breccias, and other unconsolidated material continue to flow or slough into the hole until they reach an angle of repose. Periodic hole cleaning sweeps with 50 bbls of viscous mud are required (every 4 to 12 hours during Leg 135) to keep the hole clean. The second casing string (16") would be set through these unstable zones about 200 m into the basalt.

D) Hole instability in hard oceanic crust is primarily a function of the age, type of basalt, tectonic stress, and fracture cementation at each location. Hole instability and poor coring recovery are nearly synonymous; therefore, good recovery with the RCB system depends almost entirely on site selection.

The extrusive basalts in Hole 504B were fractured during the cooling process and were further fractured by compaction and tectonic activity. Fractured basalts less than 2 my old usually have not been stabilized (by cementation with calcite, chlorite and other alteration products). The 9-7/8" RCB hole would be cored as deep as possible until another casing string or liner was required by hole conditions (or was set as insurance to protect the time investment and assure deeper penetration).

RECOMMENDATIONS:

1) The sediment and upper unstable basalt should be cored first to verify geological interest, to obtain samples and logs, and to determine rock stability and operationational suitability before drilling the larger "deep" hole and running casing.
2) Hole cleaning would be optimized using frequent viscous mud sweeps (20-30 bbls every core) and high circulation rates (50-60 gpm/inch of bit diameter) to clean-out the sloughing material while coring or

drilling. Supplemental mud shipments may be required during the leg.

3) The hole should be circulated clean using 50 bbl viscous mud sweeps at periodic intervals as required (about every 12 hours).
4) The hole gage should be rereamed on connections and rereamed while short tripping through the new hole section (after about 24 hours of rotation).
5) A casing packer could be set to "squeeze cement" into unstable zones if required.
6) Extremely unstable zones may be dealt with by setting nesting casing strings through them as deep as possible.
7) "Drill-In-Casing" may be used to case-off extremely unstable upper zones and provide an anchor for the reentry cone.
8) Jars should be run in the BHA to provide a means to "jar" (hammer) the drill string free.
9) Hole openers and roller reamers for hard formations should be built to start (center punch) the 9-7/8" core holes in larger casing and to "open" (enlarge) the 9-7/8" core holes to run larger casing strings.

E) The torquing action of the core bits and the core condition at Hole 504B indicate the formation is naturally fractured (before coring) into boulders and broken rubble with some cementation. Recovery and ROP usually improve as cementation improves; however, recovery has decreased linearly with depth at Hole 504B from 35% at 488 m to 15% at 1562 m (Attachment 3). In coring tests onshore in competent hard rock, RCB recovery was 36%.

Deeper sections of young intrusive basalts appear to slough rock splinters into the hole when first cored (probably to relieve tectonic stress). Hole 504B on Leg 137 only had 3 m of fill after 4.5 years; therefore, the hole appears to have reached equilibrium now (although minor amounts of rock splinters continued to be recovered in junk subs).

RECOMMENDATIONS:

a) Proper hole cleaning and frequent rereaming are the most practical solutions at present

F) The hole also becomes undergage (probably from tectonic stress relief into the borehole). In Hole 504B on Leg 137, the bottom 17.5 m of hole was cored with occasional high torque, took weight to ream out and had to be reamed-out four additional times. Some calcite chips were recovered on Leg 137, which may indicate that mineral deposition was partially responsible for the undergage hole. Hole infill and sloughing problems were neglibible during Leg 137; however, minor amounts of stressed rock splinters were recovered in junk sub runs. Some whole core sections were fractured horizontally into biscuit sized discs.

Roller reamers (run just above the bit to maintain gage), stabilizers (run in the drill collars) and string reamers (run above the drill collars) may be required to provide repeated rereaming; however, they do add additional risk for stuck pipe and complicate any fishing attempts.

RECOMMENDATIONS:

a) The hole may have to be reamed and rereamed repeatedly until tectonic stresses have been relieved, and the wellbore has reached equilibrium. A minimum of 10 min. per connection and 1 hour per trip is lost in rereaming.

b) Stabilizers, roller reamers and string reamers should be available if required to maintain gage control after the initial hole is opened.

G) Thermal Shock: Aside from depositional and tectonically induced stresses in basalt, hole instability will occur from thermal shock when starting circulation. During Leg 137, circulation was broken at 1000 m (and every 200 m) while running-in to bottom after trips, and circulation rates were gradually increased from 100 to 400 gpm over one hour to reduce "thermal shock" on bottom.

RECOMMENDATIONS:

a) The effectiveness of gradually increasing circulation to reduce thermal shock is unknown; however, it is considered cheap insurance (about 1 hour per trip is lost) and it should be used.

2) Hard Rock/Slow ROP: The basalt in Hole 504B is very dense (3.0 gm/cc and 0.5% porosity) and highly fractured, but has low abrasivity. Although diamond impregnated core bits had a faster rate of penetration (ROP) than insert bits on Leg 137, they wore-out in only 2 hours. The conventional 9-7/8" RCB roller cone bits have been the only bits that satisfactorily advanced the hole.

A) Coring: The ROP with 9-7/8" RBI C-7 (API Class 7-3-7) RCB core bits in Hole 504B averaged 2.23 m/hr (34 m in 15.25 hrs) and 1.39 m/hr (20.2 m in 14.5 hrs). Both bits had all the driver row of tungsten carbide inserts broken off.

RECOMMENDATIONS:

a) A harder formation API Class 8-3-7 bit will be tested on Leg 140. The Class 8 bits should last longer and provide additional data to further improve RCB survivability and performance. In Hole 504B at 1600 mbsf, rotating times of 40 hours should ultimately be possible (50 m penetration per bit run every 60 hours). Harder API Class 9 cutting structures (bits) are available also if required.

B) Drilling: In Hole 504B at 1600 mbsf, a 9-7/8" Smith F-7 (API Class 7-3-7) tri-cone bit drilled at 1.7 m/hr and was not damaged. Class 7 bits were used to ream tight hole with no damage.

RECOMMENDATIONS:

a) It should be possible to enlarge (open) holes or drill ahead at 1.7 m/hr (averaging 68 m per bit every 60 hours) using API Class 7-3-7 and 8-3-7 bits and hole openers.

b) Opening long sections of hole for larger casing sizes will require piloted API Class 7 or 8 hole openers to "center punch" the 9-7/8" initial core hole and to avoid "sidetracking" (starting a new hole).

C) Spot Coring: Two 7-7/8" diamond impregnated core bits cored 2.0 m and 1.1 m before wearing-out in about 2 rotating hours. The bits were constructed with the hardest matrix material available. Recovery was excellent (79.0%).

RECOMMENDATIONS:

a) The diamond impregnated bits that have been tested to date would only be useful for spot coring short intervals because of their limited life (about 2 hours).

b) Efforts should be expanded to find harder formation diamond impregnated or diamond set bits, possibly using KTB or mining industry diamond impregnated bit technology.

c) Hybrid bits using diamond core trimmers and roller cone or PDC cutting structures should be investigated, because if contingency casing strings are set, the hole can only be continued using smaller diameter coring tools. Also, non-roller bearing bits can operate under temperatures approaching 600°C.

D) Bits under development: An experimental Amoco designed 9-7/8" "Anti-Whirl" Polycrystalline Diamond Compact (PDC) core bit was tested on Leg 136 (Hawaiian Arch) at 318 mbsf. The PDC cored 24.2 m in 4.4 rotating hours (5.5 m/hr) and had 20.3% recovery; however, the PDC cutters were severely damaged. The bit was modified slightly and rebuilt (using a different manufacturing technique) and retested in hard Arbuckle limestones and shales (30,000 psi compressive strength). The PDC bit cored 25.5 ft in 0.75 rotating hours (34.0 ft/hr ROP) and recovered 94.9%. The PDC bit will be tested again in Hole 504B at the end of Leg 140 if time permits.

A roller cone RCB bit cored 13.4' in 0.94 hrs (14.3 ft/hr ROP) with 33.6% recovery. The RCB roller cone bit had considerable vertical motion and rotational vibration. The core was split, broken and crushed, and the core catcher had jammed at least two times. The RCB roller cone bit is undergoing additional testing to determine the source of the vibration.

RECOMMENDATIONS:

a) PDC core bit design should be pursued because they have shown excellent ROP and good recovery and are the most feasible current alternative to roller cone core bits.

b) Efforts should continue to determine if anti-whirl technology is applicable and beneficial to roller cone bit core recovery.

3) Poor Core Recovery: Core recovery appears to be mainly a function of the depth (Attachment 4, Hole 504B recovery) and consolidation of the cored material. Pillow lavas with brittle, fractured, glassy rinds tend to be mechanically unstable and shatter or wedge in the core catcher. Unconsolidated breccias, sands and gravels usually either do not enter the RCB core barrel or flow back out. Fractured basalts less than 2 my old usually have not been stabilized by cementation with calcite, chlorite and other alteration products. Jamming of the core catcher by wedge-shaped fractured basalt is a common coring problem.

In Hole 504B, RCB core recovery using 4-cone tungsten carbide bits has decreased almost linearly from about 35% at 488 mbsf (Leg 69) to about 15% at 1622 mbsf (Leg 137). The poor recovery is attributed mainly to the fractured nature of the basalt.

Two 7-7/8" diamond impregnated bits run with the RCB system cored 3.1 m and recovered 2.45 m of core (79.0% recovery) on Leg 137; however, the short 2 hour rotating life makes those diamond impregnated bits impractical except for occasional spot coring.

RECOMMENDATIONS:

a) To improve recovery, an area should be selected that has few fractures and extensive cementation of the rock fractures to improve recovery.

b) Efforts should be expanded to find harder formation diamond impregnated or diamond set bits, possibly using KTB or mining industry diamond bit technology. Efforts to harden the diamond impregnated or diamond set bits to increase rotating life should be continued.

c) Continue efforts to harden PDC bits for use in hard formations. The Anti-Whirl PDC bit tests demonstrated the practicality of using PDC bits to core hard formation with excellent recovery (at least onshore, ie, without heave).

d) Consider hybrid core bits with PDC or tungsten carbide teeth and diamond core trimmers.

4) High Temperatures: The operating temperature limits of elastomer seals on coring tools is a primary technical impediment to deeper penetration in hot holes. Although much of the upper cased section of a deep penetration may be part of the relatively cool hydrologic recharge zone, temperatures of 400° C (758° F) or more are possible in order to reach the primary target which is the deep hydrothermal heat and chemical exchange zone.

A) Most elastomer seals lose their elasticity after reaching about 160° C (320° F) and cooling down. EPDM is good to about 550° F and PEEK is good to 600° F, but they are firm materials, elasticity is poor and they take a set when cooled down. The bottom hole static temperature in Hole 504B (Attachment 5) was 161 degrees C (322° F) at 1561.5 mbsf (a gradient of 9.7° C/100 m or 5.3° F/100 ft) (Attachment 4). The predicted bottom hole static temperature of a 2000 m hole would be 194° C (381° F) at Hole 504B.

In Hole 504B, the internal temperature of the tools only reached 71° C (160° F) when circulation was broken while tripping-in; therefore, the thermal operating depth limit can be extended by using the cooling effect of circulation, but current coring tools, bits and jars would have limited life.

RECOMMENDATIONS:
a) Seals would require replacement each trip to maintain elasticity.
b) Composite elastomers, fibre and flexible metal seals should be investigated to extend temperature tolerance.
c) Taking the time to break circulation in stages while tripping-in can protect some elastomers at elevated static temperatures.
d) The initial site selected should have a relatively cool 5.5° C/100 m temperature gradient or less.

5) Stuck Pipe/Fishing/Tool Failure: Hole instability is the primary cause of stuck pipe when coring oceanic crust. Unlike oil field and land coring operations, ODP does not use mud weight or mud products to invade (damage) and mechanically stabilize the hole; therefore, cleaning the hole with sea water at high circulating rates and viscous mud sweeps are the only defense (other than setting casing strings through them). Jars must be run in deep unstable hole to provide the energy necessary to hammer the drill string out of tight holes.

The danger of tool failure due to cycle stressing is greatest when tools are penetrating slowly. A 6-3/4" Christensen core barrel parted in Hole 504B on Leg 137 probably due to cycle stressing against a ledge during slow coring.

RECOMMENDATIONS:
a) Frequent BHA inspections will be required (about every other trip or every 200 hrs).

b) Additional time should be added to the program to accommodate additional precautionary trips (when slow ROP is encountered) and to cover fishing time lost while clearing downhole tool failures.

c) Fishing tools inventory will need to be updated because the operating philosophy will change to one of fishing lost tools due to the time investment in a deep hole.

d) A Whipstock should be ready on the rig in case a sidetrack around a fish is required.

6) Deviation: The angle in Hole 504B was 2-1/2° at 1620 mbsf; however, deviation in excess of 3° has severely increased rotational torque and keyseating in almost all deep holes. Hole angle should be controlled by using large, heavy 9-1/2" drill collars on the bottom of the BHA to create a "plum-bob" or "pendulum" effect. In the event that the hole angle exceeded 5°, the hole would be sidetracked to maintain a straight hole.

RECOMMENDATIONS:

a) Hole angle surveys will be taken every 70 m through the first casing into the basalt (about 500 mbsf) and every 150 m thereafter if the hole angle is less than 2°.

b) Deviation at the bottom of the first casing into the basalt must be held to 1 degree maximum.

c) Pendulum type bottom hole assemblies (large 9-1/2" OD bottom drill collars-possibly below a stabilizer) will be required to hold angle to less than 3° maximum.

d) Mud motors and directional drilling techniques may be required to correct hole angle if it exceeds 5°.

e) Formations at the selected site should have minimal dip angle to facilitate drilling a straight vertical hole.

7) Hydrocarbons/Safety: ODP's present pollution prevention procedure is to use a strenuous pre-site review process (PPSP) to avoid potential hydrocarbon accumulations or hazardous gases (H2S, CO2 and radon) and to terminate penetration if migrated or anomalous hydrocarbons or hazardous gases are encountered. The probability of encountering hydrocarbons in basalt penetrations is negligible, but hazardous gases or radon are a potential hazard.

RECOMMENDATIONS:

a) Maintain routine gas sampling to check for H2S or hazardous gases and terminate operations if they are encountered.

B) The future addition of a DCS Riser system for slimhole coring would add an additional risk to the crew and ship. An "oil field style diverter" (large diameter air operated gate valve and flowline) would be added to the riser at the surface. The diverter would permit safely venting any gas, steam or hot liquids that flowed (or rose by gravity displacement) up the riser out the sides of the ship away from the crew and ship.

RECOMMENDATIONS:

a) A diverter is required with any riser system because even though the casing might not be set deep enough to contain the pressure, some gas might rise up into the riser before it could be disconnected. The riser would funnel the expanding gas to the rig floor unless it is diverted at the surface. Opening the riser at the sea floor would not pervent it from acting as a conduit for rising gas.

C) If reasonable potential existed for abnormal pore pressures or the possibility of encountering hydrocarbons (ie, continental shelf sites) or hazardous gas, an "oil field" style pressure control casing string and subsea well control equipment would be required. This equipment has been removed from the ship.

RECOMMENDATIONS:

a) Fracture gradients in deep water marine sediments are characteristically low; therefore, protection casing would be cemented in competent basalt to provide a casing shoe pressure seal and subsea well control equipment would be required.

7) Weather & Current: Currents in excess of 2.0 kts have caused problems with casing deflection and drill string vibration on several occassions. The longer and larger diameter casing strings necessary for deep penetrations will exacerbate this problem.

RECOMMENDATIONS:

a) Current at all depths should be less than 1.0 knot during the projected operating time slot and stable in direction. This is required to avoid casing vibration and horizontal offset techniques while running long casing strings (greatly increasing handling difficulties, running time, reentry problems, and mechanical risk).

EQUIPMENT LIMITATIONS:

Drillship and drilling equipment limitations that might affect deep drilling capability are as follows.

1) SEDCO/BP 471 Drill Ship:

The equipment aboard the SEDCO/BP 471 is listed in Appendix A of the UDI/ODP contract (Attachment 6).

a) Max. Water Depth for Dynamic Positioning: 8230 m (27,000 ft).

b) No recirculating system. The shale shakers and associated surface mud handling equipment have been removed.

Unstable formations (such as sediments, fractured pillow lava, tectonically or thermally stressed splintering basalt, unconsolidated flowing sand and gravel, tectonically induced hole closure and swelling in pressured formations) can sometimes be controlled with weighted fluid; however, using weighted fluids is not economically feasible without a riser because the fluid cannot be recirculated (down hole and back to the ship). The cost to "pump away" (ie, without returns to the surface) 10.0 ppg gel mud at 400 gpm would be about $2,000/hr (weighted salts with polymer would be more expensive). Limited bulk storage on the ship (8860 sx gel max.) could be alleviated by rental of an auxiliary mud barge or rental P-tanks on deck, but nearby onshore mud resupply capability would be very helpful in the event of problems.

Without a riser system, weighted fluid to control unstable formations can only be spotted when circulation is stopped (ie, while tripping or logging). Weighted spotting fluids in hot holes must be treated with lignite thinners and fluid loss chemicals to insure that they do not solidify. In deep water marine sediments, the low fracture gradients and shallow hole depths (short hydrostatic height for weighted fluid) limit the effectiveness of weighted fluid in countering hole instability. Mud materials also contaminate the formation obscuring geochemical analysis and reducing log quality; therefore, the preferred hole cleaning method is to circulate sea water at high rates (50-60 gpm/in hole dia.) and use 20-30 bbl. viscous gel sweeps (70-120 sec.) about every other core. There is no evidence (at 1600 mbsf penetration) to indicate that hole cleaning cannot be maintained using gel sweeps and circulating sea water.

c) No riser/well control system: Without a riser system, there are no returns to the surface of sloughed formation to determine that pore pressures are underbalanced; therefore, anticipating or controlling flows essentially depends on visual core indications and expedient interpretation of core gas data. After coring, temperature logs have shown flow into and out of several holes (504B has a long flow history). A "well kick" (or "flow") can only be controlled by blindly spotting weighted (densified) fluid in the hole using dynamic kill techniques (high circulating rate/annular pressure drop to help control flow). The PPSP review procedure now precludes coring in known hydrocarbon areas such as the continental shelf.

A sea-floor Blowout Preventer (BOP) would be required to properly control "well kicks" or "flows". A deep water BOP would require a sonar signaling system to activate charged accumulator bottles on the sea-floor. In 2000 m water depth, a long riser filled with 10.0 ppg weighted fluid would impose an additional hydrostatic pressure (over sea water) of 512 psi at the sea-floor. The 512 psi represents an additional hydrostatic load on the formation; therefore, the weak fracture gradients of deep water oceanic sediments will not support even modest increases in circulating fluid density (the same limits apply to viscosified fluids used to carry cuttings from the hole).

An additional point to consider is that a 2000 m riser standing full without drill pipe would hold 1220 bbls of 10.0 weighted fluid, which would increase riser tension (weight) by 75,600 lbs if closed-in at the sea-floor.

Note: The Diamond Coring System (DCS) Phase III will employ a 5" X 5-1/2" DP tensioned riser system. The conceptual studies are scheduled to be ready in September 1991. A platform mounted system will be tested in early 1992 on Leg 142 (E. Pacific Rise). If funding, developmental engineering and ship scheduling permit, the DCS riser system could be tested in mid-1993 (about Leg 150).

The very small annular area (with 3-1/2" DP in a 4.125" ID DP) would limit the use of weighted fluids to polymerized heavy salt "muds" because the centifuging effects of a high speed rotation in a narrow annulus would seperate gel mud solids (and cuttings) and form ring plugs. A thinned gel or polymeric viscosifier would probably be added to the circulated sea water to improve carrying capacity.

d) Limited casing storage aboard. Long casing strings would have to be taken out to the ship on auxiliary vessels.
e) 22' diameter moonpool. Large guidebases would have to be keelhauled over the side.
f) Fuel, water & stores for 70 days + emergency reserves for 35 days. A hole requiring more than 70 days would require resupply by auxiliary vessels. A crew change would be required after 55-60 days, so the ship would go into port or consummables and casing would be brought out at that point.
g) Operating air temp -18° C to 43° C.
h) Sea temp -2° C to 27° C.
i) Under normal operating conditions dynamic positioning system can maintain surface location within 1% of water depth. At 3% excursion coring is stopped and at 5% excursion hole is abandoned. For deep drilling a water depth of 2000 to 3500 m is preferred to provide additional overpull in the drill string. Shallower water depths would increase the angle and effects of any excursions due to current and weather.

2) Derrick: a) Capacity: 1200 KIP. b) Casing Load Limits at 5000 m WD: 20" - 1000 m, 16" - 1250 m, 11-3/4" - 2000 m.

3) Top Drive: a) Maximum allowable static load with Roll: +/- 7°(10 sec. period), Pitch: 3° (10 sec. period), Heave: 5 ft (10 sec. period), Wind: 50 kts. b) Traveling eqpt wt 175,000 lbs, Overpull 100,000 lbs, Hanging load 700,000 lbs

4) Drawworks: Has 3000 hp with dual electric braking system and band brakes.

5) Bulk Storage: Eight (8) pressure tanks hold 13,628 cu.ft. of bulk storage. Normal storage is 4580 sks barite, 2215 sks gel and 3202 sks cement.

ODP TOOLS:

6) Drill Pipe: a) Max. Design length: 9140 m (30,000 ft) b) 5" 19.50 lb/ft nom. S-140 5-1/2" FH (22.10 lb/ft w/TJ, 19.22 lb/ft in SW), Tensile Strength: 738,443 lbs. c) 5-1/2" 26.70 lb/ft nom. S-140 (31.9 lb/ft w/TJ, 27.75 lb/ft in SW), Tensile Strength: 1,099,557 lbs.

TYPICAL STRESS IN 8232 M (27,000 FT) DRILLING ASSEMBLY:

Description	Length x Weight in SW (Ft) x (Lb/Ft in SW)	Wt in SW (Lbs)	Tens. Top Jt. (Lbs)
Dynamic (Heave)		60,000	60,000
8-1/4" BHA	500'x 118.0 lb/ft SW	59,000	119,000
5-1/2" DP Trans.	300'x 27.75 lb/ft SW	8,325	127,325
5" DP	17,200'x 19.22 lb/ft SW	330,584	457,909
5-1/2" DP	9,000'x 27.75 lb/ft SW	249,750	707,659
Top Drive		45,000	752,659
Overpull		47,341	800,000
	27,000'=8230 m		

Total Load on Hook (UDI limit 800,000) =800,000

Blocks/Heave Comp (UDI limit 1,000,000)=145,000
Deadline/Fastline (12 lines) =157,500

Total Load on Derrick(UDI lim 1.2 mil)=1,102,500

Therefore, under these extreme conditions the top joint of 5" DP would be exposed to 62% of it's rated strength, and the top joint of 5-1/2" DP (at the rig floor) would be exposed to 64% of it's rated tensile strength. Dynamic loading depends on sea state, and more 5-1/2" DP can be run to adjust for extreme sea states; however, these numbers are for illustrative purposes. The ODP allowable tensile loading is 80% on DP (API limit is 87.5% for condition 1 pipe).

7) Casing Hanger: Hang-off limit, A Tripple String Hanger would be used to set 80 m of 20" casing in 26" hole, 700 m of 16" casing in 18-1/2" hole and up to 1500 m of 11-3/4" casing in 14-1/2" hole. An 8-7/8" liner would be hung as required by hole conditions (and possibly tied back to the casing hanger to protect the 11-3/4" cased section.

8) Retrievable Wear Bushing: would be required to protect the casing hanger and upper casing from rotational wear.

9) Guide base and mud plate: Now fits dual casing hanger for 16" x 11-3/4" csaing. It would have to be modified to fit the triple

casing hanger. Mud plate support may also have to be increased to accommodate higher hang off loads.

10) Directional Survey Instruments: Totco is good for angle, but multishot cammera film is at the temperature limit now in Hole 504B at 160°C. Higher temperature directional survey equipment is needed.

11) Coring Wireline: The drum unit is a National Drawworks. The coring wireline is rated for 30,000 lbs tensile, and the working load limit is 18,000 lbs. The line weight is 0.5 lbs/ft; therefore, the coring WL is good for 27,000 ft and could be enhanced with a tail-end addition of smaller line.

LDGO TOOLS:

11) LDGO Logging Cable: Standard logging cables are not reliable above 177°C, and are normally replaced with teflon cables at higher temperatures. About 2000 m of cable rated at 260° C (for 1 hour) will be added for Leg 139. A 1000 m section of French metal oxide 400 ° cable may also be available for Leg 139. In Hole 504B on Leg 137, the bottom portion of cable was damaged and the bottom torpedo had a burned smell and was discarded.

12) Schlumberger/LDGO Logging Tools: A recent survey of logging tool temperature ratings (Attachment 7) revealed that most Schlumberger logging tools are rated to 177°C, with many rated to 260°C. A good supply of backup tools is critical because each tool has limited life before it fails. Logging often involves several tool runs to get a useable log. Some experimental research tools (Sandia) have higher temperature limits and may have application, expecially in slim holes.

SITE SELECTION:

1) The ideal specifications for the initial geological site should be as follows (to improve chances for success):

- A) Hole Depth (Penetration): 2000 to 3000 m with 200 to 500 m.
- B) Water Depth: 2000 to 3500 m.
- C) Formation: a) Sediment: Fairly consolidated clay or nanno-ooze without loose sand and gravel. No BSR or hydrocarbons--standard PPSP approval.
  b) Basalt: Coarse grained basalt (or well cemented if fractured). Basalt should be a minimum of 2 MY old, perferably horizontal, in an area of low techtonic stress and have a low temperature gradient (5.5 deg C/100 m or less).
- D) Topography: Relatively flat and featureless with a firm sea floor.
- E) Weather & Seas: The operation should be scheduled for the best weather window (minimal danger of severe

storms), and located in an area with prevailing calm wind (0-25 kts), mild swells (0-8 ft), small waves (0-4 ft), and minimal current (less than 1 kt).

F) Transportation: Area should be within range of small work/crew boats (500 miles) and helicopters (300 miles) to accommodate crew changes, drilling equipment and consumables resupply, emergency medical evacuation, etc. so ship can stay on location for the duration of the project. Work/crew boat, helicopter, international airport, and port and customs facilities should be available in the area.

WELL PLAN:

1) An optimum location should be selected that avoids extreme conditions and meets as many of the ideal criteria as possible.

2) Hole A: Core an 11-7/16" APC/XCB hole to the top of the basalt (about 275-500 mbsf). NOTE: Hole 504B conditions were used because of general familiarity with that hole and in lieu of a specific proposed site. The estimated time required is 1.9 days (Attachment 8).

3) Hole B: Wash down to the top of basalt. Core a 9-7/8" RCB pilot hole to 200 m into the basalt-est 475 mbsf-and log to verify that geological (hole) conditions are favorable at the site for a deep penetration. The estimated time required is 8.0 days (Attachment 7).

4) Triple and double casing hanger systems (Attachment 9 and 10) now are available. The triple casing system provides an additional contingency casing string and would probably be used in deep drilling. The reentry cone system would be modified to accept the triple handger system, and the triple hanger system would be modified to accept 13-3/8" flush joint casing instead of 11-3/4". The double casing hanger system is the standard system now in use.

A) Hole C, Triple Hanger Option: Run a reentry guidebase and tripple string (20"/16"/11-3/4") casing hanger with 80 m oasing. Wash-in 20" casing to 80 mbsf and set guidebase. Drill an 18-1/2" hole to 200 m into the basalt (about 475 mbsf). Run 16" casing and cement. RCB core with 9-7/8" four-cone insert bits as deep as practical (est. 1500 m) and log. Open hole to 14-3/4", run 13-3/8" casing and cement. RCB core as deep as practical (est. to 2000 mbsf) and log. Open hole to 12-1/4", run 11-3/4" liner and cement. RCB core as deep as practical (est. to 2500 mbsf) and log. If coring will be continued, open hole to 10-1/2", run 9-5/8" liner and cement. Continue coring with 8-1/2" tools below this point. The estimated time (without any contingency time) required to 2000 m is 101.4 days without a liner or 106.5 days with a liner.

B) Hole C (Dual Hanger Option): Run a reentry guidebase and double string casing hanger with 80 m of 16" casing. Drill a 14-3/4" hole to 200 m into the basalt (about 475 mbsf). Run 11-3/4" casing and cement. RCB core with 9-7/8" four-cone insert bits as deep as practical without setting a liner (est. 1500 m). Install a 9-5/8" liner if required by hole conditions. Continue coring with 8-1/2" tools below this point.

000434

ATTACHMENT 8

TIME ESTIMATES

HOLE A: (based on 3000 m WD, 275 m sediment):	
RIH w/ 11-7/16" APC/XCB coring assembly	8
Jet-in test to 100 mbsf	2
APC/XCB core 0-275 m:	
(275 m/ 9.5 m) 0.9 hr WL/core	27
POOH w/ DP & LD APC/XCB	8

Total Hole A: 46 hrs=1.9 days	

<u>HOLE B:</u> (based on 3000 m WD, 275 m sediment and 200 m basalt pen.)	
PU RCB coring assembly, RIH, Run VIT & R/E	10
RCB core 275-475 mbsf:	
(200 m/ 9.5 m)x (2.5 hr rot + 1.5 hr WL/core)	84
Cond Hole	4
Drop bit and pull up to log	3
Log, Take Samples, Packer Tests	36
POOH w/ O/E DP	8

Total Hole B: 191 hrs=8.0 days	

<u>HOLE C, Triple Hanger Option:</u>	
MU R/E Cone & Tripple Hanger + 80 m 20" Casing	8
RIH to sea floor	10
Wash-in 20" casing	6
Release running tools, POOH	10
PU 18-1/2" Bit & RIH to R/E Cone, Reenter	10
RIH to 80 m	1
Drill 18-1/2" Hole 80 to 475 mbsf:	
Sediment: 80-275 m=(195 m/20 m/hr)	10
Basalt: 275-475 m=(200 m/3.8 m/hr)	53
Trip: ((63 rot hrs)/40 hrs/bit)-1)x 18 hrs	18
Cond Hole	4
POOH w/ 18-1/2" bit	10
MU Hanger + 37 Jts 16" Casing	10
RIH to R/E Cone, Reenter	10
Run 16" Casing & Cement	8
POOH w/ DP & LD Running Tools	12
RIH w/14-3/4" x 9-7/8" Hole Opener, Drill shoe & Cmt, center punch new hole, POOH	25
PU 9-7/8" RCB BHA, RIH to R/E Cone, Reenter	10
RIH to 475 m	2
RCB core 475 m to 1500 m:	
Rot:475-1500 m=(1025 m/ 9.5 m/core)x (4.5 hrs)	486
WL: 1025 m / 9.5 m/core)x 1.9 hrs	205
Trips: ((486 hrs/35 hrs/bit)-1) x 18+2 hrs/trip	260
Cond Hole for logs	8

POOH w/RCB bit	8
RIH w/ logging bit & reenter	8
RIH to 485 m	1
Log, Take Samples, Packer Tests	72
POOH w/ logging bit	6
RIH w/ 14-3/4" Hole Opener to R/E Cone, Reenter	10
Open 9-7/8" hole to 14-3/4":	
Rot: 475-1500 m=(1025 m/ 15.0 m/hr)	68
Trip for HO:((68 hrs rot/25 hrs/HO)-1)x 18+2 hrs/trip	40
Cond hole for casing	6
POOH w/ Hole Opener	8
MU Hanger + 84 Jts 13-3/8" Casing	18
RIH to R/E Cone, Reenter	10
Run 13-3/8" Casing & Cement	10
POOH w/ DP & LD Running Tools	10
RIH w/12-1/4" x 9-7/8" Hole Opener, Drill shoe & Cmt, center punch new hole, POOH	25
PU 9-7/8" RCB BHA, RIH to R/E Cone, Reenter	10
RIH to 1500 m	6
RCB core 1500 m to 2000 m:	
Rot:1500-2000 m=(500 m/ 9.5 m/core)x (8.0 hrs)	424
WL: 500 m / 9.5 m/core)x 2.2 hrs	117
Trips: ((424 hrs/30 hrs/bit)-1) x 20+2 hrs/trip	286
Cond Hole for logs	8
POOH w/ RCB	8
RIH w/ logging bit & reenter	8
RIH to 485 m	1
Log, Take Samples, Packer Tests	72
POOH w/ logging bit	6

Total Hole C to 2000 m: 2434 hrs= 101.4 days

RIH w/ 12-1/4" Hole Opener to R/E Cone, Reenter	10
Open 9-7/8" hole to 12-1/4":	
Rot: 1500-2000 m=(500 m/ 12.0 m/hr)	42
Trip for HO:((42 hrs rot/25 hrs/HO)-1)x 20+2 hrs/trip	22
Cond hole for casing	6
POOH w/ Hole Opener	10
MU Liner Hanger + 41 Jts 11-3/4" Liner	12
RIH to R/E Cone, Reenter	10
Run 11-3/4" Liner, Hang & Cement	12
POOH w/ DP & LD Running Tools	10

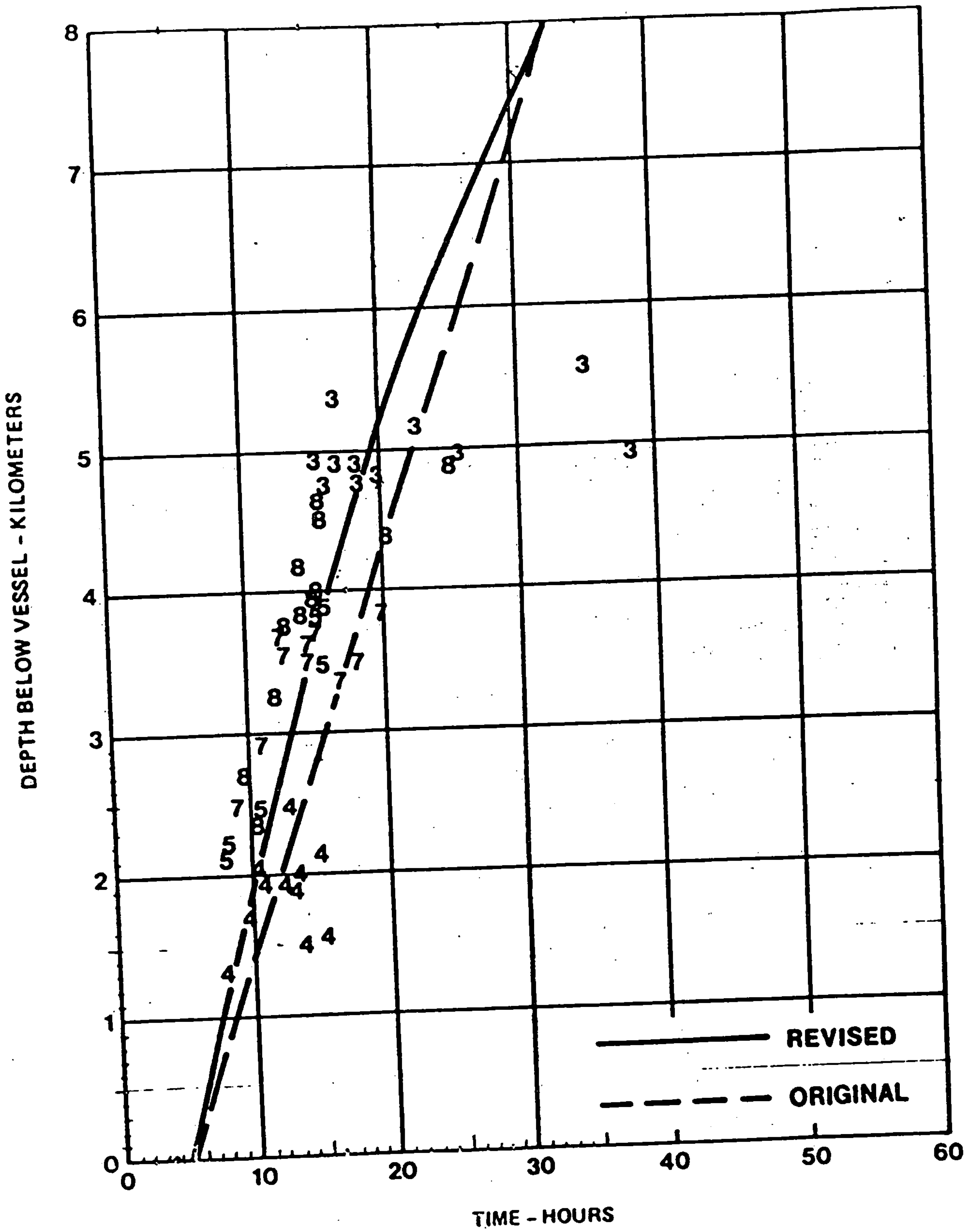
NOTE: At this point, the hole can be cored ahead with 9-7/8" standard RCB equipment as deep as possible. A 9-5/8" liner could be hung in the 11-3/4" liner and the hole could be continued with slim hole coring tools.

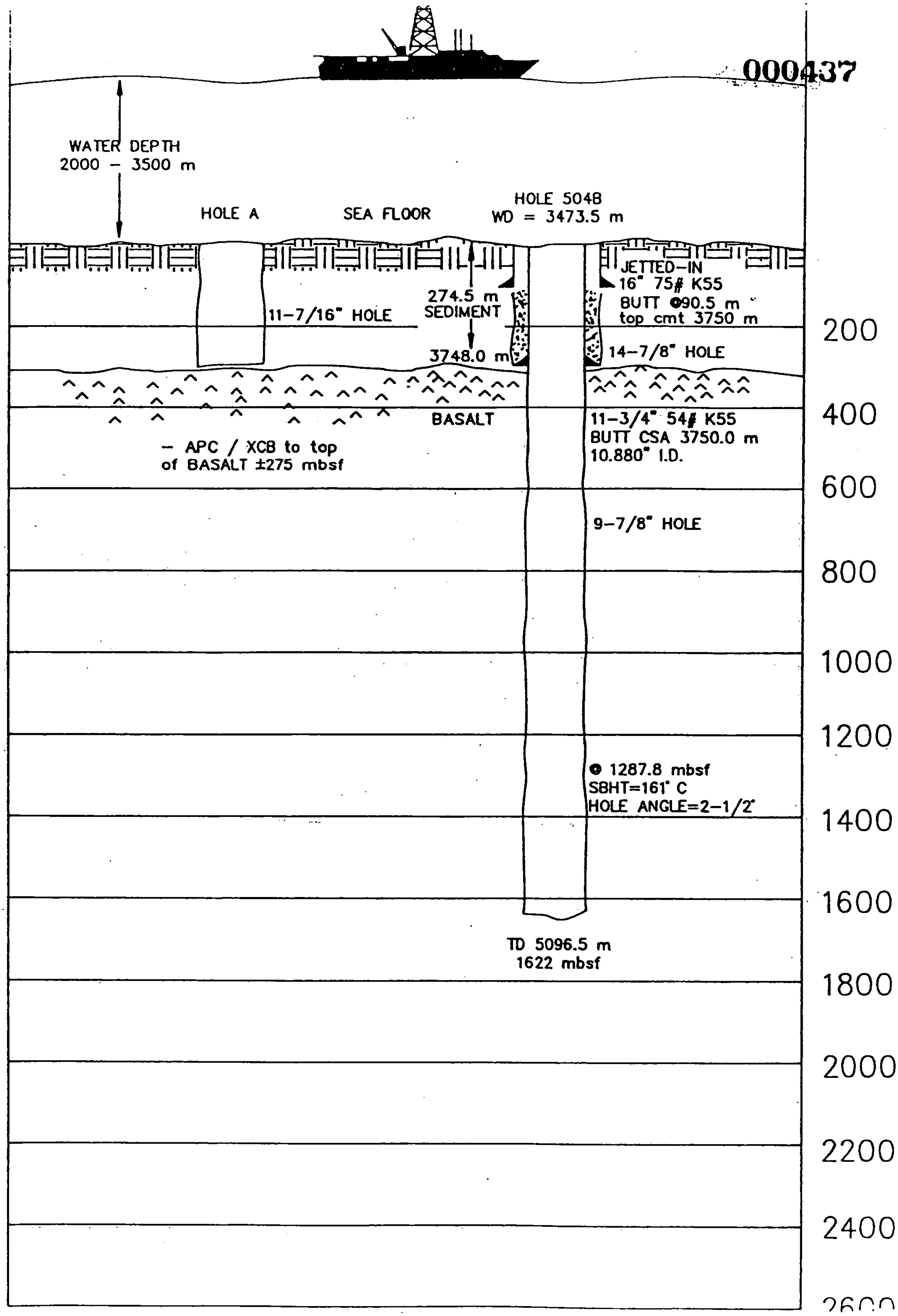
Total Hole C w/ liner to 2000 m: 2556 hrs=106.5 days

FIGURE 1

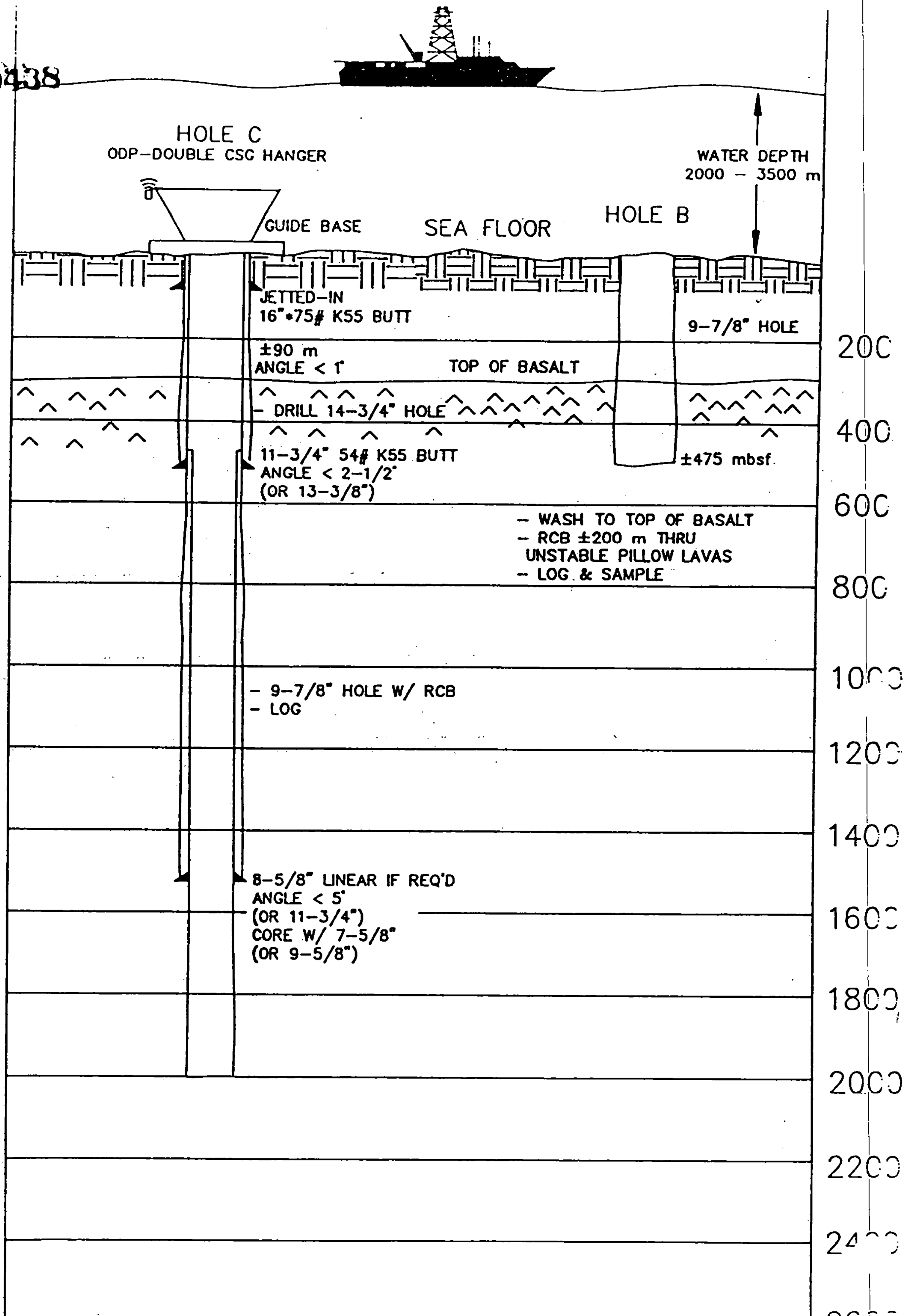
000436

DRILL STRING ROUND TRIP



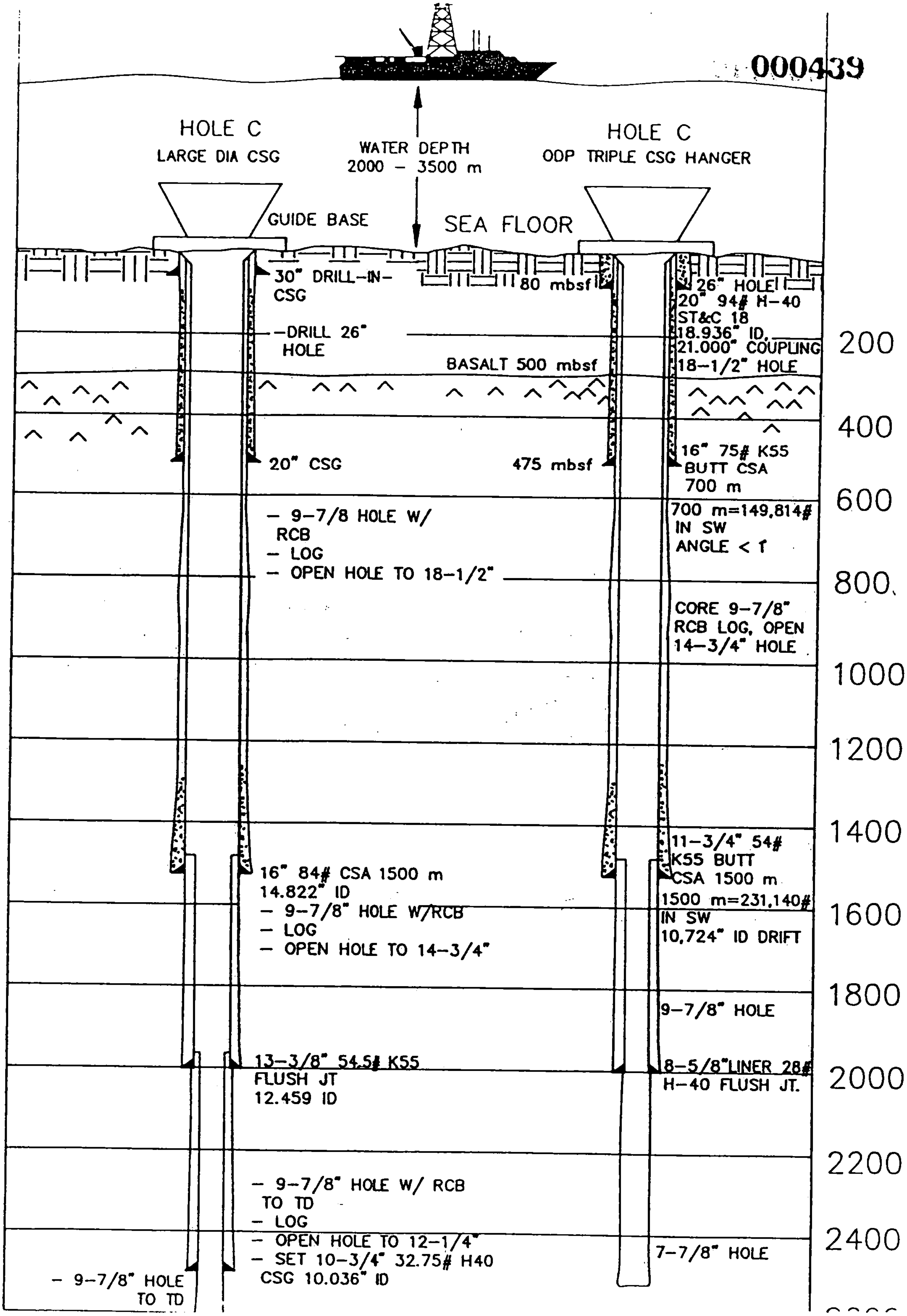

WATER DEPTH
2000 – 3500 m
HOLE A
SEA FLOOR
HOLE 504B
WD = 3473.5 m
JETTED–IN
16" 75# K55
BUTT @90.5 m
top cmt 3750 m
11–7/16" HOLE
274.5 m
SEDIMENT
3748.0 m
14–7/8" HOLE
BASALT
11–3/4" 54# K55
BUTT CSA 3750.0 m
10.880" I.D.
– APC / XCB to top
of BASALT ±275 mbsf
9–7/8" HOLE
@ 1287.8 mbsf
SBHT=161° C
HOLE ANGLE=2–1/2°
TD 5096.5 m
1622 mbsf
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400
2600

000438



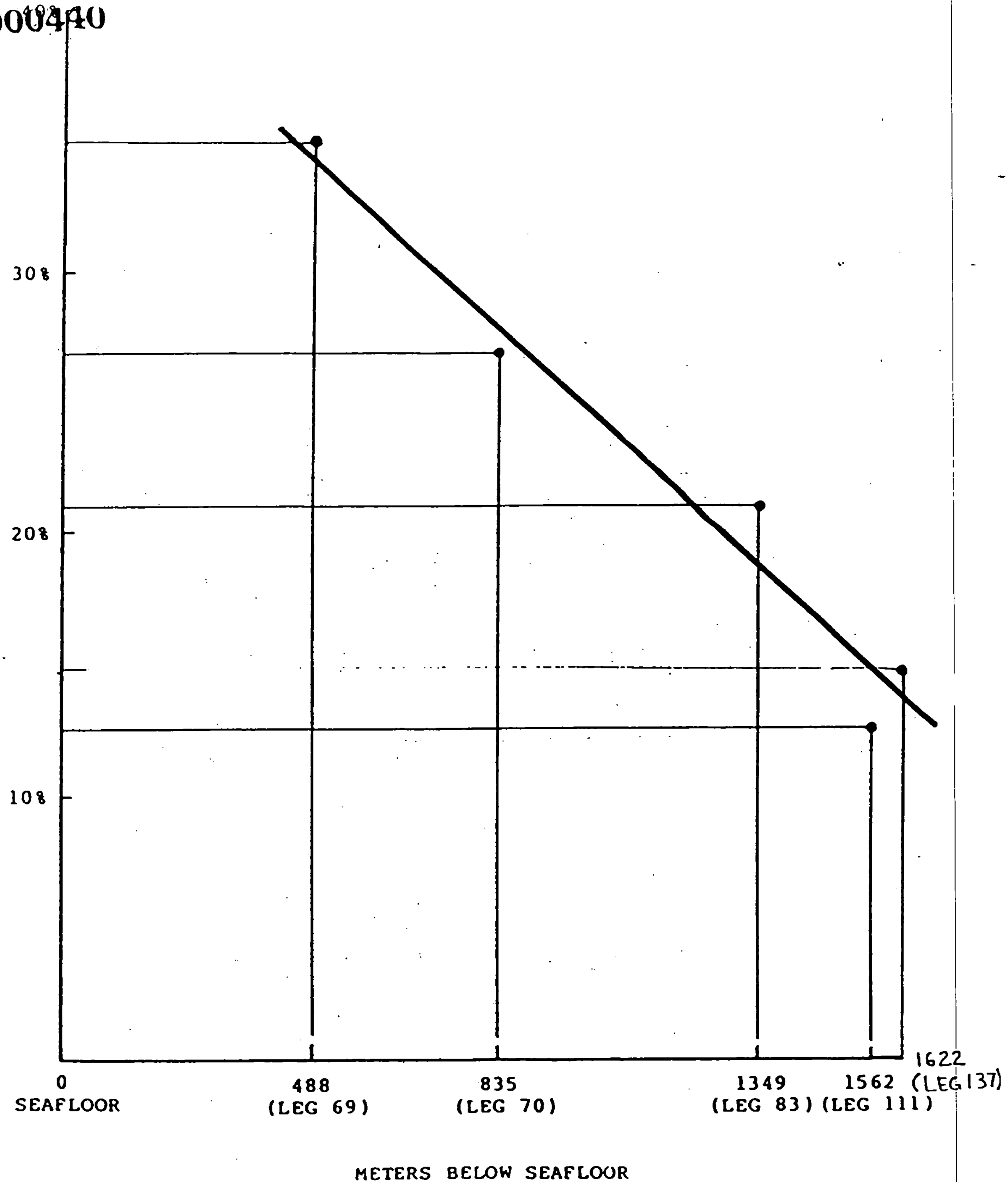
HOLE C
ODP-DOUBLE CSG HANGER
WATER DEPTH
2000 – 3500 m
GUIDE BASE
SEA FLOOR
HOLE B
JETTED-IN
16"*75# K55 BUTT
9-7/8" HOLE
±90 m
ANGLE < 1°
TOP OF BASALT
– DRILL 14-3/4" HOLE
11-3/4" 54# K55 BUTT
ANGLE < 2-1/2°
(OR 13-3/8")
±475 mbsf.
– WASH TO TOP OF BASALT
– RCB ±200 m THRU
UNSTABLE PILLOW LAVAS
– LOG & SAMPLE
– 9-7/8" HOLE W/ RCB
– LOG
8-5/8" LINEAR IF REQ'D
ANGLE < 5°
(OR 11-3/4")
CORE W/ 7-5/8"
(OR 9-5/8")
200
400
600
800
1000
1200
1400
1600
1800
2000
2200

000439


HOLE C
LARGE DIA CSG
WATER DEPTH
2000 – 3500 m
HOLE C
ODP TRIPLE CSG HANGER
GUIDE BASE
SEA FLOOR
30" DRILL-IN-CSG
80 mbsf
26" HOLE
20" 94# H-40
ST&C 18
18.936" ID,
21.000" COUPLING
18-1/2" HOLE
–DRILL 26" HOLE
BASALT 500 mbsf
20" CSG
475 mbsf
16" 75# K55
BUTT CSA
700 m
700 m=149,814#
IN SW
ANGLE < 1°
– 9-7/8 HOLE W/ RCB
– LOG
– OPEN HOLE TO 18-1/2"
CORE 9-7/8"
RCB LOG, OPEN
14-3/4" HOLE
11-3/4" 54#
K55 BUTT
CSA 1500 m
1500 m=231,140#
IN SW
10,724" ID DRIFT
16" 84# CSA 1500 m
14.822" ID
– 9-7/8" HOLE W/RCB
– LOG
– OPEN HOLE TO 14-3/4"
9-7/8" HOLE
13-3/8" 54.5# K55
FLUSH JT
12.459 ID
8-5/8"LINER 28#
H-40 FLUSH JT.
– 9-7/8" HOLE W/ RCB
TO TD
– LOG
– OPEN HOLE TO 12-1/4"
– SET 10-3/4" 32.75# H40
CSG 10.036" ID
7-7/8" HOLE
– 9-7/8" HOLE
TO TD
200
400
600
800
1000
1200
1400
1600
1800
2000
2200
2400

HOLE 504B
PERCENT CORE RECOVERY AS A FUNCTION OF DEPTH

000440



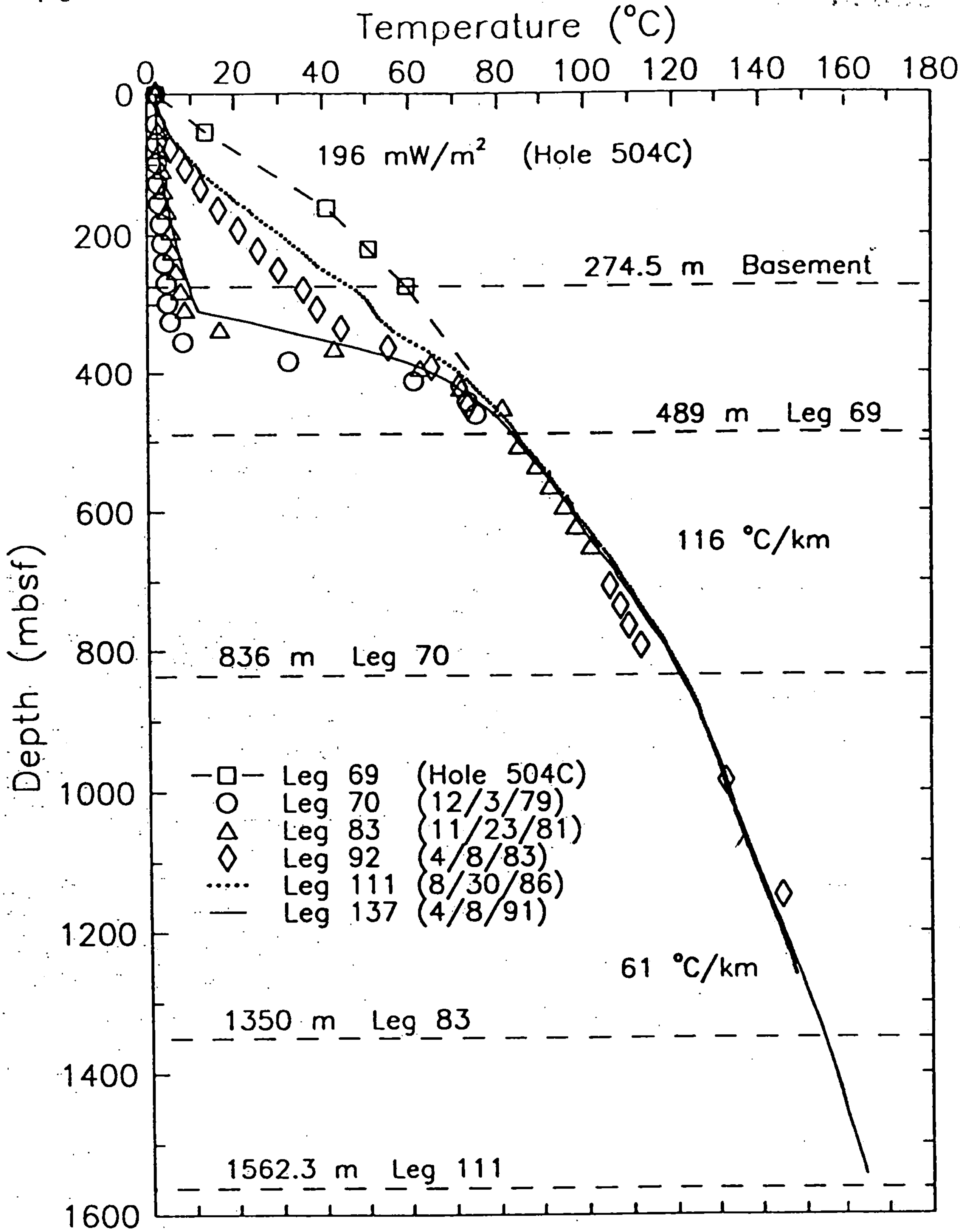
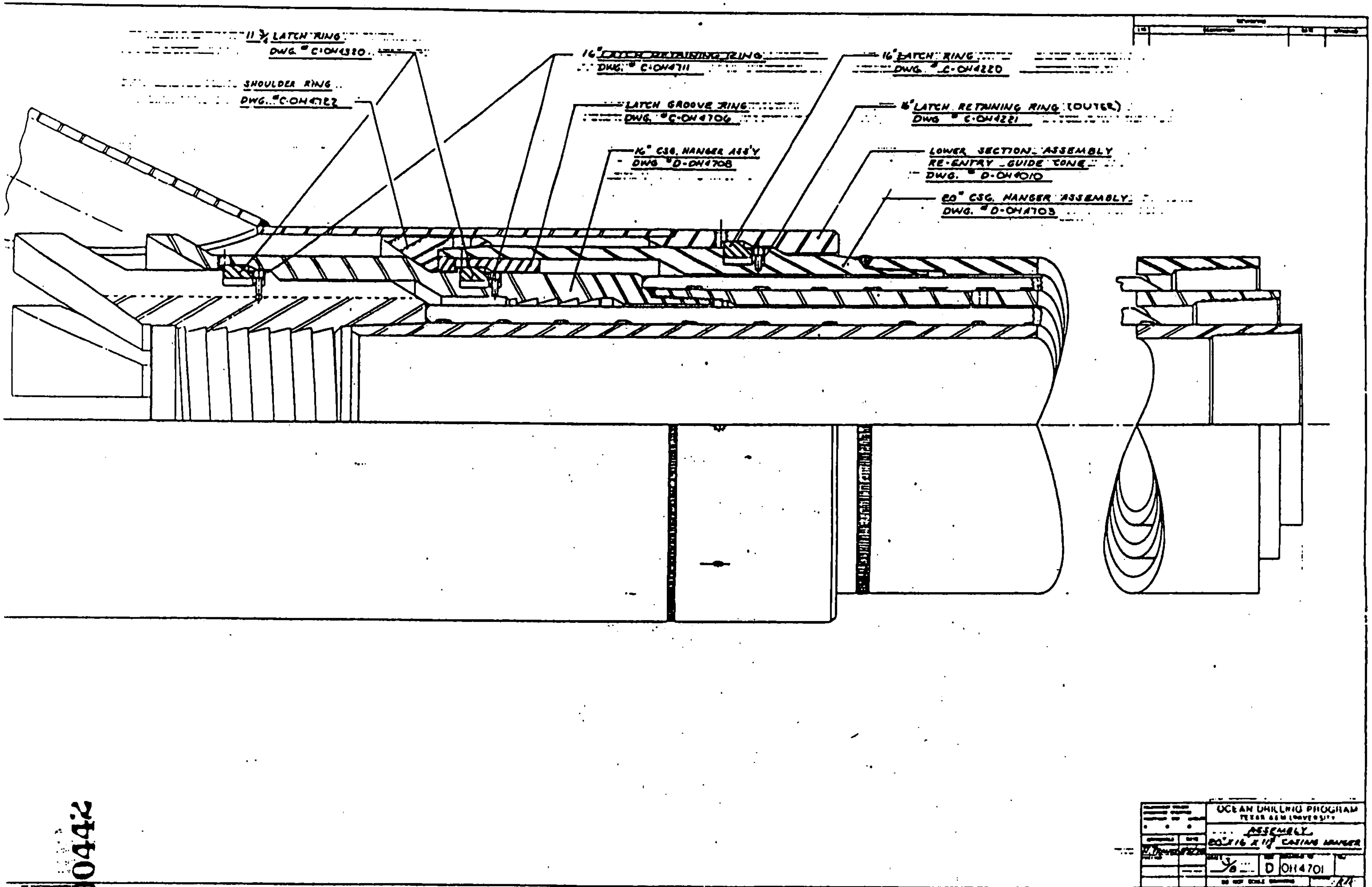
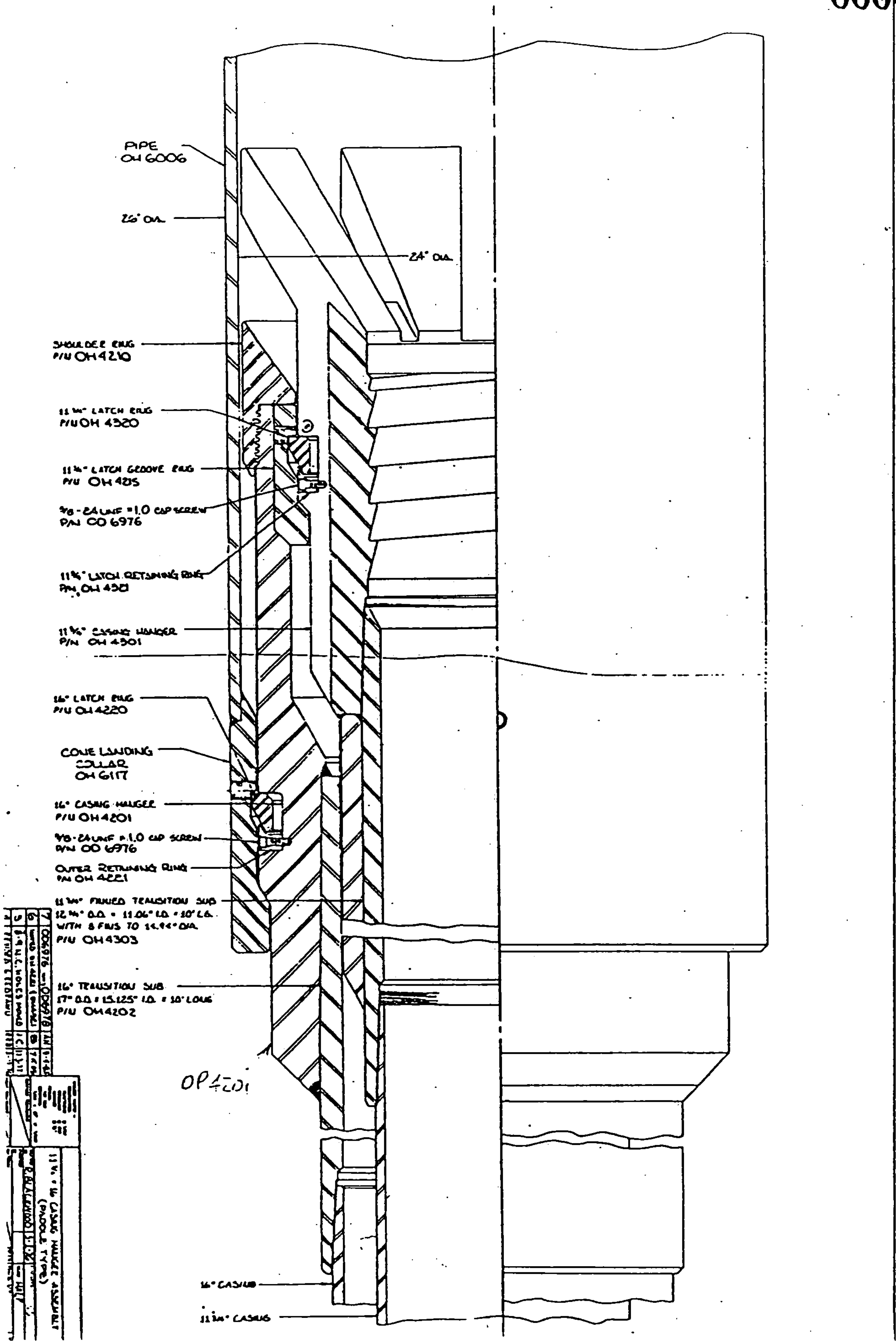


Figure 3. Composite of temperature logs obtained in Hole 504B during Legs 69, 70, 83, 92, 111, and 137.


11 3/4 LATCH RING
DWG. # C-OH4320
SHOULDER RING
DWG. # C-OH4727
16" LATCH RETAINING RING
DWG. # C-OH4711
LATCH GROOVE RING
DWG. # C-OH4706
16" CSG. HANGER ASS'Y
DWG. # D-OH4708
16" LATCH RING
DWG. # C-OH4220
16" LATCH RETAINING RING (OUTER)
DWG. # C-OH4221
LOWER SECTION ASSEMBLY
RE-ENTRY GUIDE CONE
DWG. # D-OH4010
20" CSG. HANGER ASSEMBLY
DWG. # D-OH4703
OCEAN DRILLING PROGRAM
TEXAS A&M UNIVERSITY
ASSEMBLY
20" X 16 X 11 3/4 CASING HANGER
D
OH4701

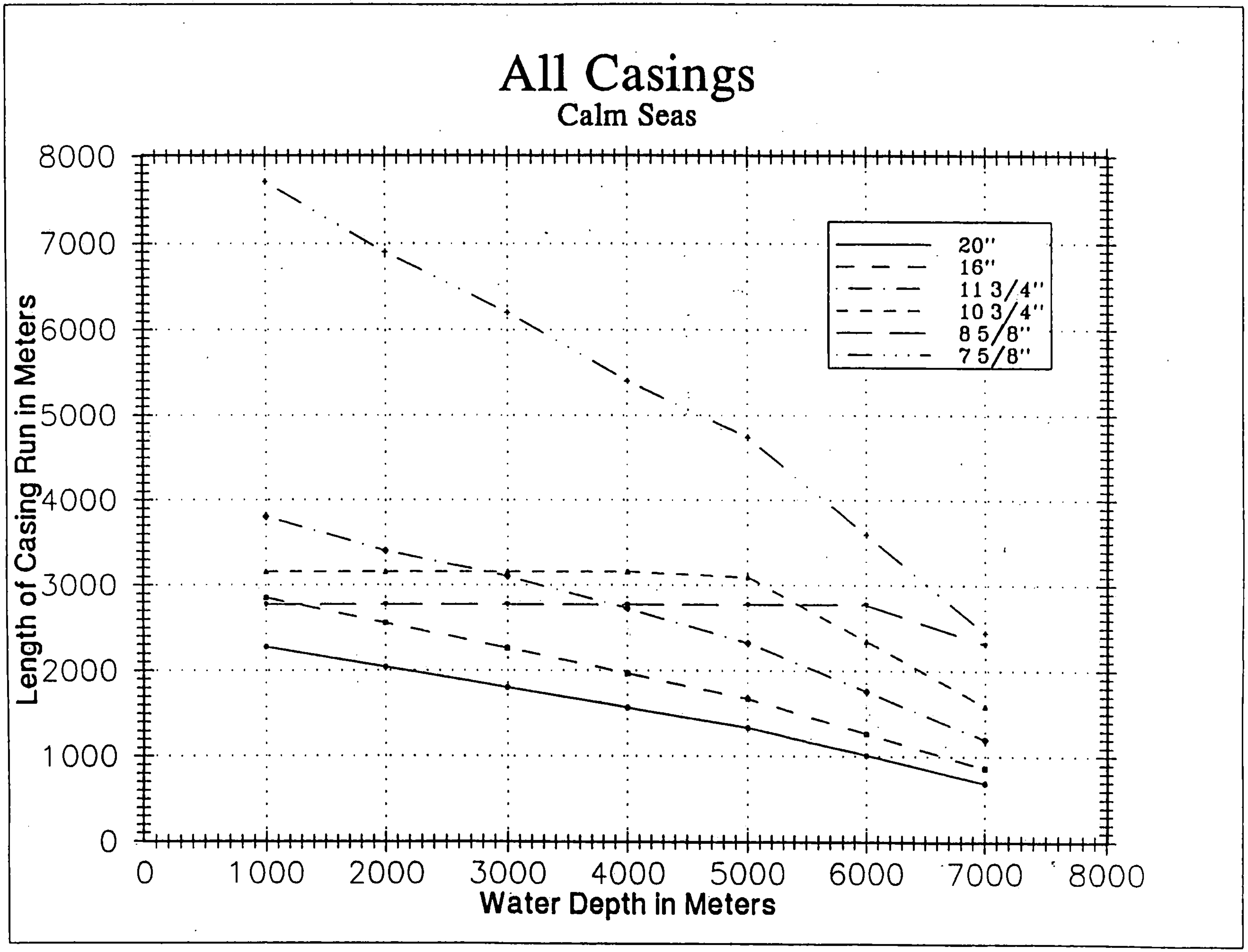
0000442


PIPE
OH 6006
26" DIA
24" DIA
SHOULDER RING
P/N OH 4210
11 3/4" LATCH RING
P/N OH 4320
11 3/4" LATCH GROOVE RING
P/N OH 4215
3/8 - 24 UNF x 1.0 CAP SCREW
P/N CO 6976
11 3/4" LATCH RETAINING RING
P/N OH 4501
11 3/4" CASING HANGER
P/N OH 4301
16" LATCH RING
P/N OH 4220
CONE LANDING
COLLAR
OH 6117
16" CASING HANGER
P/N OH 4201
3/8 - 24 UNF x 1.0 CAP SCREW
P/N CO 6976
OUTER RETAINING RING
P/N OH 4221
11 3/4" FINNED TRANSITION SUB
12 3/4" O.D. x 11.06" I.D. x 10' LG.
WITH 8 FINS TO 14.94" DIA.
P/N OH 4303
16" TRANSITION SUB
17" O.D. x 15.125" I.D. x 10' LONG
P/N OH 4202
OP4201
16" CASING
11 3/4" CASING

000444

APPENDIX F

TAMU. CASING LIMITS


All Casings
Calm Seas
Length of Casing Run in Meters
Water Depth in Meters
20"
16"
11 3/4"
10 3/4"
8 5/8"
7 5/8"
0
1000
2000
3000
4000
5000
6000
7000
8000

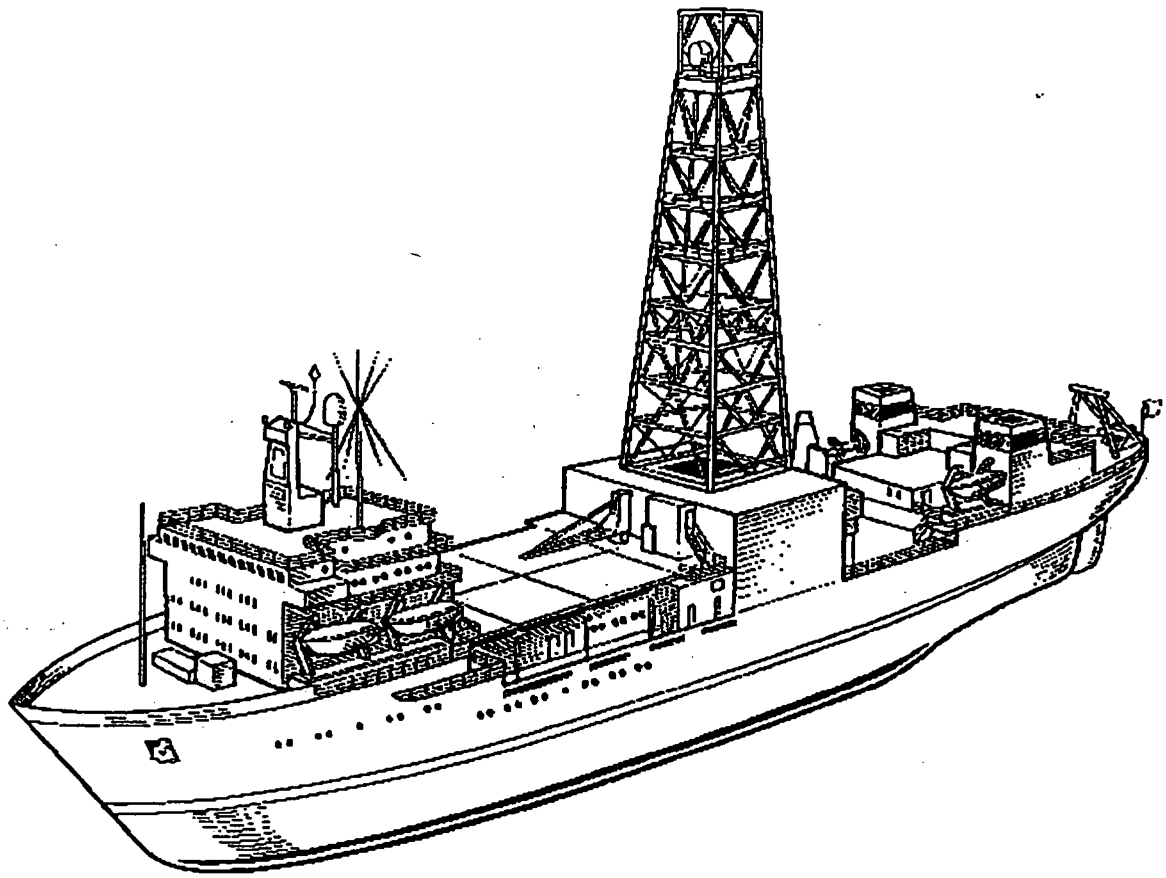
000446

APPENDIX G

DETAILS OF SOVIET AND JAPANESE FUTURE DRILLSHIPS

000448

USSR
ACADEMY OF SCIENCE
P. P. SHIRSHOV INSTITUTE OF OCEANOLOGY



DEEP-SEA CORE DRILLING RESEARCH VESSEL

Purpose: Deep-sea core drilling, holes up to 1500 m, water depth up to 6000 m. The research vessel is to be put into operation in 1994.

Main particulars:

Displacement, t	20500
Deadweight, t	8000
Technological reserves, t	2200
USSR Register Class notation	KM ⊛ YΛ $\boxed{1}$ A2
Length, o.a., m	159
Breadth o.a., m	25,3
Height, m	11,7
Draught o.a., m	7,7
Fuel endurance	150
Accomodates	126
(incl. scientific staff)	35
Main diessel generators, kwt	6 x 2360
Output, kwt	2 x 2500
Trusters, kwt	5 x 1400
Speed at design drought, kn	12

The R/V is being stabilized over the drilling site by dynamic positioning system. The DP system provides retention with accuracy 3 per cent from the sea depth under the following environment conditions: wind speed up to 23 m/sec, wave height up to 7 m, current up to 1 m/sec.

The R/V is equiped with one 25 t and four 3 t cranes.

Technological complex

A special core drilling technology for sampling in rocks forming ocean floor even without sediments has been developed for the vessel. The core diameter is up to 100 mm. The technological process is ensured by the retrievable down-hole motors, core barrels and other tools which have undergone fullscale tests in hard formations of Krivoi Rog Super-Deep well. To form a drill string there were designed special pipes (aluminium, steel D.P.'s and D.C.) of 146 mm ID. The drilling process is provided by "Uralmash-7000 BIS" drilling complex of 500 T capacity. The power swivel is a main drive for a drill string rotation. Three pipe stands are stored on mechanized racks. The complex is equipment by a mud system, material storage and feeding systems, cementing complex, compressor plant.

Scientific complex

The vessel is capable of providing the following research task:

— full-scale investigation (petrophysical, geochemical, etc.) of core samples;

— geophysical and bathymetry measurements on route between sites and area survey thereof;

— dispatching point ensuring the control of the well drilling;

— geophysical investigation in holes by various methods of logging;

— data collection, aquisition and exchange during a specific exploration or a full-scale research;

— data base management.

Scientific-research laboratories and a computer centre housed vertically at six levels in the middle of the vessel beneath the drilling decks are connected by elevator to carry core samples within the lab zone. The total area of this part of the complex is about 740 sq.m, accomodating 21 compartments including 3 refrigerating storage chambers.

The logging and technological lab complex is housed beneath the drilling deck and is shifted to the stern from the drilling rig. The complex accomodates 6 compartments totalling 173 sq.m.

The lab designed for on route and the area geophysical surveys is located aft with entrance to the open deck of the poop equipped with winches. The area of this part of the complex is 167 sq.m.

The scientific-research complex of the vessel as a whole accomodates 38 compartments totalling 1,226.5 sq.m.

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JAMSTEC

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On the report of "Committee of Deep Sea Drilling"

June 1991

Ocean Development Div., STA

INTRODUCTION

Recently, earth and ocean sciences and related technologies has become increasingly important for understanding global problems and environmental change. One research area that is important for Japan and the international community is the study of the ocean crust structure and plate dynamics by sampling the earth crust materials under the ocean floor. Analysis of this kind of information leads to better understanding of the global enviromental history and evolution, volcanic earthquake and activity in the ocean, and the prediction of earthquake and volcanic events. However, there is currently only one Ocean Drilling Programme, ODP, and it is an American programme with a strong international component. The area for the drilling is restricted because of the limited ability of the drilling vessel. Consequently, there is a head for a more advanced and capable system.

In the report by "Council of Ocean Development" and "the basic programme of research and development on the earth science and technology," which was authorized by Prime Minister in August 1990, the importance of developing a Deep Sea Drilling System was detailed as follows;

1. Present Condition of Deep Sea Drilling Research

(1) Present circumstances

The first deep experimental drilling was condcuted in U.S.A. in the Mohole Programme 1961. International deep sea drilling researches (DSDP and IPOD) were first carried out from 1968 untill 1984 using the drilling vessel "Glomer Challanger". Since 1985, the Ocean Drilling Programme has been operated with the second drilling vessel "JOIDES Resolution" supported by NSF, and this programme will be continued untill 1993. Since, Japan has participated in these international programmes.

(2) Deep Drilling Programmes on Land

U.S.S.R. is drilling up to about 15,000m at Kol'skill Peninsla, and Germany (Ministry of Technology) is promoting a deep drilling programme (KTB) to drill up to 10,000m as a big project from 1990.

(3) World-wide construction of Deep Sea Drilling Vesseles

The U.S.S.R. is constructing a deep sea drilling vessel of 20,000 tonnages in displacement. France is planning to construct a sediment drilling vessel and is calling on some countries of EC to join this project.

2. Significance of Deep Sea Drilling Research and Develoment of Deep Sea Drilling Systems

(1) Progress of Ocean Research

Deep Sea Drilling Research is an important element of ocean research, such as ocean observation and deep sea research.

It is only possible to study certain phenomena under the sea floor by sampling sediment and crust under the ocean floor and other measuments using a drilled hole.

(2) Progress in Earth Science and Technology

The deep sea drilling research will contribute significantly to the progress of basic science such as geology, geochemistry and geophiscs, and the collaboration between each field of science.

Basic reserach is also important for the study of commercial resources used by human beings.

(3) Research on Plate Dynamics and Global Enviromental Exchange

Drilling is the best method for collecting data to study the plate dynamics of the ocean floor and the evolution of the earth and the analysis of mechanism and prediction of earthquakes.

The drilling research will also contribute to the study of gloval enviromental change by sampling submarine sediment of the ocean floor during the last 200 million years.

(4) International Contribution for the Progress of Basic Scientific Research

It is important to promote ocean research as a member of technologically advanced nations.

It will be considered a "center of excellence' in the field of the ocean science and technology.

(5) Development of High Technology for Drilling Vessel

System

As the progressive and universal tehcnology which can be established by a lots of informatins of technology and science, the fruits by the development of the deep sea drilling vessel system will be the incentive to make the technology wide, and the effect by this development can be expected.

3. The Conception of Research using the Deep Sea Drilling Vessel System

(1)Research on the Oceanic Crust

Study the vertical structure of oceanic crust by direct sampling.

Analyzes the tectonic structure of oceanic crust and the flux from the earth (mantle diapir)..

(2) Analysis of Plate Dynamics

Research on the formation of oceanic plates at mid-ocean ridges.

Research on the formation process of slip surfaces and faults at subduction zones, and studies on the phenomena of earthquake and earthquake prediction.

Analysis of geological history of the island arc of Japan by drilling in the Japan sea.

(3) Analysis of Global Enviromental Change

Analysis of the global enviromental change and the mechanism of change by core sampling of ocean floor sediment over a couple of 100 million years .

(4) Basic Research on the Resources under the Ocean Floor

Basic Research on the mechanism of the formation and the distribution of submarine resources.

(5) Network of Ocean Observations

Utilizing drilled holes for continuous and wide network of ocean observation for the measurement of earthquakes and crustal strain .

4. Construction of the Deep Sea Drilling Vessel System

(1) Basic Conception

The system should be able to drill up to the Mohorovicic's discontinuity, and should be developed during the next ten years.

We should take the first step to start this program as soon as possible, considering the demands of researchers, the pressing international seientific need, and the situation of the basic science in Japan.

(2) The Process of developing the Deep Sea Drilling Vessel System

The first step should be to define the capability of the deep sea drilling system. The system will be able to work in any sea area around Japan and the world. (The depth of drilling under the ocean floor will be 4,000m with mud circulation, and 7000m with bare drilling widthout the riser pipe.)

The vessel will also be installed with experimental facilities and as such will be "the floating universal research center."

5. Necessary Functions for Deep Sea Drilling Vessel System and Technical Development

(1) Necessary Functions for Deep Sea Drilling Vessel System

Deep sea drilling vessel system with mud circulation system and deep sea marine riser system is necessary in order to protect hole from collapse at brittle layers and to prevent blow-out of crude oil or natural gas. (Joides Resolution has no marine riser.)

Drilling capability and down hole measuring capability at high temperatures up to 350 C to 400 C is necessary.

(2) Technical Development Items

Deep Sea Marine Riser and Mud Circulation System :

Development of higher strength-to-weight-ratio material and stronger bouyancy material for the deep sea marine riser than the present practical one is necessary. (Several hundred meters length for actual use and up to 2,300 meters length for experimental ones.) Countermeasure against contamination in core sample by drilling mud should be developed.

Blow Out Preventer (BOP) :

Highly reliable BOP for the deep sea should be developed

Drilling under the high temperature condition :

Drilling bit, downhole measurement and drilling mud for the high temperature up to 350 C to 400 C should be developed. Present drilling and downhole measuring are only tolerable up to about 200 C and less than 200 C respectively.

Core Sampler :

Improvement of recovery rate for the undisturbed core sample is necessary.

Others :

Steady drilling at the bear rock area, automation and highly efficient operation of drilling, and built-up of safety operation should be realized.

(3) Procedure of the Development for the Important Elementary Technologies :

Technology developments in other fields must first be assesed, in order to determine necessary technologies for the development of the deep sea drilling vessel.

Especialy for the development of the deep sea marine riser, prompt execution of numerical analysis of the riser motion and model experiment and verification at sea should be conducted during the development period. Their results should be fed back to the later half of the development.

6. Themes for future Disscussion

It is necessary to disscuss the structure for the research organization and international collaboration.

(1) The Method for Research

We need to discuss methods to advance the research of deep sea drilling, to define the basic direction for international collaboration, to make an effective plan for the research, to develop and improve the technology of the most advanced drilling system, and to take care of the core samples.

(2) Effective Operation of the System

We need to secure the organization and staff to operate the vessel and the drilling system, some facilities to supply the materials, and the administration the study on board.

(3) International Collaboration

We need to make research plan and decide how to handle international collaboration.

PRINCIPAL PARTICULARS

ITEM		DEEP SEA DRILL VESSEL	JOIDES RESOLUTION
Length	(M)	165	143.39
Breadth	(M)	27	21.34
Depth	(M)	11	9.75
Gross ton	(T)	15,000	9,715
Variable load	(MT)	10,000	8,647
Speed	(kt)	13	13
Derrick hight (from Sea level)	(M)	77	62
Drill pipe length	(M)	10,000	8,647
Riser length	(M)	4,000	Non
Crew & Scientist	(person)	130	122

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JOIDES LITHOSPHERE PANEL

MINUTES OF 9-11 OCTOBER 1991 MEETING
NICOSIA, CYPRUS

EXECUTIVE SUMMARY

1.0 LIAISON REPORTS

1.2 Ocean History Panel

In response to OHP's request, LITHP reviewed the Santa Barbara supplemental science proposal for APC coring in the upper 200 m of sediments. Although the proponents' main interest is to obtain a high resolution marine record to investigate climate change and the carbon cycle--an objective not within LITHP's mandate--there is some interest in drilling this area, based on the potential implications for ore deposit formation. Sediment-hosted ore deposits often form by venting into a stratified anoxic water column. Near the Channel Islands there has been enough faulting and fluid flow to generate hydrothermal barite deposits. Although this aspect of the coring is not developed, it could prove interesting. LITHP also suggests that the proponents include individuals interested in the tectonics of the S. California borderland in the planning. LITHP could be interested in drilling in this area, but would like to see it treated as an "add-on" proposal rather than subtracting from Leg 146.

1.5 Downhole Measurements Panel

In response to this report, LITHP made the following recommendation:

LITHP supports the acquisition of a memory tool for temperature measurements during upcoming legs. Even though drilling disturbs the formation temperatures, it is still a critical measurement. Acquisition of the tool should be accompanied by an effort to determine how to calculate formation temperatures from these measurements.

1.7 OPCOM

LITHP is delighted that development of the DCS system is the top priority, and that PCOM recognizes the urgent need for this system in order to accomplish many of the LITHP objectives. LITHP also views the current formation fluid sampling and hydrologic property measurement situation as serious, and has made a strong joint recommendation with TECP concerning development of these capabilities (see joint LITHP-TECP Meeting Minutes).

LITHP's other major concern is deep drilling, which is a critical aspect of its Long Range Plan. ODP presented their studies to TEDCOM in September, and expect to report to PCOM in December on the status of their studies.

LITHP endorses a feasibility study for deep drilling. It is disappointed with the lack of response by TEDCOM to the deep drill site submitted to them for consideration. For future planning, LITHP needs to determine whether its goal of a continuous section through the oceanic crust is realistic in terms of time, technology and cost.

LITHP therefore recommends that a feasibility study be commissioned as soon as possible to evaluate the time, technology, and cost of drilling:

(i) a 4 km hole
(ii) a 6 km hole
in oceanic crust.

LITHP wants this assessment to culminate in a report as soon as possible, and will make one panel member--Dan Moos--available to work with a consultant whenever necessary. LITHP requests that other panels interested in deep drilling do the same, and would like a progress report at its March 1992 meeting.

2.0 SUPPLEMENTAL SCIENCE PROPOSALS

2.1 Proposal S-2: Downhole Measurements in Jurassic Oceanic Crust of Hole 801C

LITHP supports logging of Hole 801C and its incorporation into Leg 144, and is willing to give up 3.5 days of basement drilling to accomplish the logging programs. However, LITHP is not willing to give up planned basement drilling at MIT-1.

In terms of the logging, LITHP feels that the packer is of highest priority and the geochemical tool of lowest priority. Other logging should be done according to operational logistics.

2.2 Proposal S-3: Proposal for a Cased Hole with Re-entry Cone for Deployment of OSN Observatory

LITHP considers it unacceptable to devastate Leg 145 by removing 10 days from its schedule and feels this is a subversion of the planning process.

LITHP is willing to give up the lithospheric objectives of Leg 145 in order to drill OSN-2. In so doing LITHP notes the following:

- there is not enough drilling of LITHP interest in Leg 145 to provide the necessary time to complete OSN-2
- the willingness of LITHP to accommodate drilling OSN-2 is due to Leg 145 not addressing high priority LITHP objectives

- **LITHP strongly encourages development of a relation with the interested Japanese parties, and instrumentation of the Hole as soon as possible.**

4.0 RANKING OF PROPOSALS IN THE NORTH ATLANTIC PROSPECTUS

Nine Legs of the proposed programs from the North Atlantic prospectus were included in the rankings with the following results:

Rank	Proposal	Total # Votes	# Members Voting/ Total Votes Possible	Percent
1	TAG	85	11/99	85.9
2	Volcanic Rifted Margins - Leg I	107	14/126	84.9
3	North Atlantic Offset Drilling - Leg I	104	13/117	82.5
4	Non-volcanic Rifted Margins - Leg I	95	14/126	75.4
5	VICAP	60	13/117	51.3
6	Alboran Basin	55	14/126	43.7
7	Equatorial Atlantic Transform	51	14/126	40.5
8	Mediterranean Ridge	37	14/126	29.4
9	NAAG - Leg I	30	14/126	23.8

Two PCOM action items arose from this procedure:

A. **LITHP recommends that a TAG-DPG be set up immediately (whether or not drilling is scheduled in FY'93) to:**

i) **examine all available data to determine the locations of appropriate drilling sites and their priorities**

ii) **consider the structural controls on the hydrothermal systems and determine how to address those through drilling.**

Nominations for Chairperson (in priority order):

1. John Hamilton (Canada)
2. Ross Large (Australia)
3. Rob Zierenberg (U.S.)

Nominations for members of a TAG-DPG:

G. Thompson (WHOI)
L. Zonenschain (USSR)
L. Kong (Japan) - or other seismologist who has worked at TAG
J. Franklin (Canada)
J. Karson (Duke) - or other structural geologist
P. Rona (NOAA)
Maurice Tivey (WHOI)
ODP Engineer

B. **LITHP recommends that the next meeting of the Offset Drilling Working Group be specifically charged with developing an initial drilling strategy for the Atlantic and laying out a provisional schedule for Atlantic drilling. This may require both an extra day of meetings, plus involvement of those proponents with interests specifically in the Atlantic. If offset drilling is scheduled for FY'93, this may better be handled by a North Atlantic Offset Drilling Detailed Planning Group. LITHP expects a progress report at its March meeting.**

5.0 OTHER BUSINESS

5.1 Panel Replacements

Jason Phipps-Morgan and Guy Smith are due to rotate off the Panel. Guy will serve for one more meeting. Jason has provided a great deal of help and a unique perspective; LITHP thanks him for his dedicated service.

LITHP recognizes the need for an individual with expertise in modeling, which Jason has brought to the Panel. Consequently, the Panel suggests:

1. Marc Parmentier
2. Roger Buck
3. Doug Wilson

(None have been contacted.)

5.2 Next Meeting

The next LITHP meeting is scheduled for 18-20 March 1992, and will be held in Davis, CA. Jim McClain has kindly agreed to host the meeting.

JOIDES LITHOSPHERE PANEL

MINUTES OF 9-11 OCTOBER 1991 MEETING
NICOSIA, CYPRUS

Attending: J. Bender, S. Bloomer, M. Cannat, S. Cloetingh, J. Franklin, P. Herzig (alternate for J. Erzinger), S. Humphris, P. Kempton, J. McClain, D. Moos, J. Phipps-Morgan, G. Smith, Y. Tatsumi, R. Zierenberg, L. Dmitriev (alternate for A. Tsvetkov; attended part of the meeting)

Liaisons & Guests: J. Allan (TAMU), J. Karson (TECP) (present to give TECP report), J. Mutter (PCOM), M. Storms (TAMU), F. Vine, (Offset Drilling Working Group).

Regrets: T. Brocher, J. Erzinger (on Leg 140)

WELCOMING REMARK
S. Humphris welcomed S. Bloomer as a new U.S. member of LITHP, P. Kempton from the U.K., who was unable to attend the March meeting as a new member because of being at sea, P. Herzig as the German representative in place of J. Erzinger who is at sea on Leg 140, and L. Dmitriev as the USSR representative in place of A. Tsvetkov.

1.0 LIAISON REPORTS

1.2 Ocean History Panel (G. Smith)
The OHP meeting was hosted by Hisataka Okada of Yamagata University and was held in Yamagata last week. The meeting was the usual agenda of reports, proposal evaluation, and ranking. OHP was unhappy with the cancellation of the S proposal option, feeling it was not really given a chance, and has asked PCOM to reconsider. Of the S proposals currently on the table, OSN-2 was met with considerable disfavor as it would involve removing a substantial chunk of an already tightly planned leg. They reluctantly offered the lower sections of either DS-1 (top of Detroit seamount) or DS-3 (on the nearby abyssal plain). If DS-1 were chosen, this would eliminate any possibility of basement drilling on Detroit seamount. Patton-Muray would be preserved but is still only slated for 50 m. OHP was more favorable to the notion of logging Hole 801C and agreed that they would be willing to give up the reefal

section of PEL-3 but recommended that the final decision be left to the Chief Scientists. An S proposal was also received for 32 hours of APC coring in the Santa Barbara Basin. This would presumably take place during the transit from Cascadia to San Diego. OHP considers this the type example of an S proposal and would like to see it drilled. OHP requested feedback from other Panels on this proposal.

Will Sager presented an argument for deep basement drilling on Detroit Seamount (DS-1). It basically revolves around the need to better constrain Pacific Plate motion, coupled with the need for more than a few meters of basalt to get a reliable paleopole. OHP agreed that better controls on Pacific Plate motion were desirable. They raised two objections to Sager's proposal. One was that relatively little time is currently scheduled for basement drilling on Patton-Murray, and transferring it to Detroit would still not provide sufficient penetration. The other is that it is unclear whether basement will in fact be reached at the currently planned depth of 500 m. Examination of the seismic sections suggests that the hard reflector at this depth may actually be sedimentary and there may be as much as 500 additional meters of sediment below it, rendering any basement drilling out of the question. At present, OHP prefers to leave the leg as planned, with no significant basement penetration other than Patton Murray (50 m).

The final matter of interest to LITHP was the global rankings of the North Atlantic Prospectus. They were as follows:

[1] North Atlantic Gateways
[2] New Jersey Sea Level
[3] Ceara Rise
[4] East Greenland Transect (NARM-volcanic)
[5] Equatorial Atlantic
[6] Iberian Abyssal Plain (NARM-nonvolcanic)
[7] Alboran Basin

Also mentioned as interesting but not ranked due to immaturity were the K-T boundary and Nicaraguan Rise proposals, and the Bermuda Rise as a single site-of-opportunity.

In response to OHP's request, LITHP reviewed the Santa Barbara supplemental science proposal for APC coring in the upper 200 m of sediments. Although the proponents' main interest is to obtain a high resolution marine record to investigate climate change and the carbon cycle--an objective not within LITHP's mandate--there is some interest in drilling this area, based on the potential implications for ore deposit formation. Sediment-hosted ore deposits often form by venting into a stratified anoxic water column. Near the Channel Islands there has been enough faulting and fluid flow to generate hydrothermal barite deposits. Although this aspect of the coring is not developed, it could prove interesting. LITHP also suggests that the proponents include individuals interested in the tectonics of the S. California borderland in the planning. LITHP could be interested in drilling in this area, but would like to see it treated as an "add-on" proposal rather than subtracting from Leg 146.

1.3 Tectonics Panel (J. Karson)

TECP's spring meeting was held in March in Davis, CA. It endorsed LITHP's concern that an Offset Drilling Work Group had not yet been formed, and emphasized the need to address the two-fold nature of tectonic questions surrounding any sites, namely:

1) the tectonics of the formation of the crust and mantle at the spreading center
2) the tectonic significance of the dismemberment and exposure in the proposed offset sites.

TECP also stressed the need to make offset drilling part of a comprehensive regional geological and geophysical study.

TECP also evaluated the status of each of eight themes of tectonic interest:

1) Rifted margins
2) Sheared (translational) margins
3) Convergent margins
4) Divergent oceanic plate margins
5) Plateaus, microcontinents, aseismic ridges, anomalous basins
6) Driving forces, including stress, intraplate deformation
7) Collisional margins
8) Plate history, sea level changes and origin of magnetic anomalies.

Watchdogs have been appointed for each theme with the responsibilities of keeping track of research on the topic, and monitoring the progress of proposals to ensure they address high priority TECP objectives. TECP has also produced a checklist of features of tectonic significance for proposals and site surveys to assist proponents in attracting TECP interest.

The results of the global rankings carried out by TECP were as follows (only the top six are listed):

1) North Atlantic Rifted Margins
2) Mediterranean collision zone
3) Chile Triple Junction - Leg II
4) Equatorial Atlantic Margin
5) Hess Deep - Leg II (a tectonic leg--no submitted proposal)
6) Caribbean crust.

1.4 Sedimentary and Geochemical Processes Panel (R. Zierenberg)

The three day SGPP meeting held in June at Lamont-Doherty Geological Observatory included a one day joint session with DMP to discuss the application of logging to solving SGPP problems and specific logging requirements for planned or highly ranked drill legs. Many of the SGPP concerns are also of interest to LITHP, particularly geochemical logging and fluid sampling. Mg was identified as a key element for improved detection and accuracy for addressing important geochemical and hydrologic problems. One possible solution is the use of an enhanced resolution tool (ERT) similar to one used at the KTB site. This is a cryogenic dewared tool that incorporates a germanium detector with much higher spectral resolution than the sodium iodide crystal detector used in the geochemical logging tool (GLT). One of the trade-offs for enhanced spectral resolution is lower counting efficiency requiring increased time for stationary measurements, which presents problems for both tool sticking and total run time in hot holes. An added benefit of the ERT would be attainment of good trace element data for elements such as Sb, As, Br, Cu, Eu, In, Ni, and Sc. The accuracy will be as good for trace elements as it is for Al; the precision is a function of element concentration.

The problems of sampling fluid from material not amenable to pore-fluid squeezing were discussed. Many of the tools available, especially for hot holes, are designed to sample bore hole fluid. Obtaining formation fluid is a difficult problem in low permeability formations. Packers are not available for hot holes and large volumes of fluid must be pumped to obtain relatively uncontaminated formation fluid. One suggestion that may warrant an engineering feasibility study is use of a "gas lift" system to under-pressure a large interval of formation allowing a time-composition extrapolation to formation fluid composition and estimation of formation permeability. SGPP also expressed interest and support for development of sealed and instrumented bore holes.

SGPP supports the revival of Red Sea drilling and requested PCOM to investigate the possibilities. Deep drilling objectives were discussed. Somali Basin sites were put forward as typical of the type of target that SGPP might support for moderately deep drilling (1-2 km), although it would not necessarily be of high priority. Deep drilling in subduction zones (4-8 km) was of interest, but considered to be unsupportable due to time and resource constraints. Budget priorities forwarded to OPCOM were:

Priority 1: Develop capability for fluid sampling and measurement of *in situ* fluid properties:
- (a) for free-flowing water in hot rock (testing system).
- (b) for pore water sampling/measurement (pressure core sampler-phase II).

Priority 2: Develop capability for recovering unconsolidated sand/rubble without extensive loss or damage to cores.

Priority 3: Use of alternative platforms for sea level/sediment architecture objectives (eg. New Jersey transect, coral islands, global change, etc.)

Priority 4: Deep-drilling for SGPP objectives (eg. Somali Basin).

Priority 5: Diamond coring system.

Priority 6: High-latitude support.
Priority 7: ODP staffing costs.

The proposed ship track and duration of stay in the Atlantic prompted SGPP to rank all SGPP-relevant proposals for Atlantic drilling as follows:

1	348	New Jersey margin	13.36
2	391	Mediterranean sapropels	12.86
3	378	Barbados accretion	12.29
4	330	Mediterranean Ridge	11.60
5	380	VICAP	11.53
6	361	TAG hydrothermalism	10.60
7	354/339	Benguela current	10.47
8	388	Ceara Rise	10.47
9	59	Madeira abyssal plain	9.53
10	323	Atlantic/Mediterranean gateway	8.71
11	372	N. Atlantic water masses	7.53
12	345	W. Florida margin	7.47
13	332	Florida escarpment	7.33
14	379	Mediterranean drilling	6.80
15	313	Equatorial Atlantic pathway	4.27
16	327	Argentine rise	3.87
17	341	Global climatic change	2.93

1.5 <u>Downhole Measurements Panel</u> (J. McClain)

The Downhole Measurements Panel met at the Lamont-Doherty Geological Observatory in June, and the agenda included a joint meeting with SGPP. In addition, DMP members were given demonstrations of the post-cruise processing and facilities at the Borehole Research Group (BRG). A number of issues of interest to LITHP were discussed. These include:

1) As of June 6 there was doubt that high-temperature logging would be available for leg 139 (Sedimented Ridges I). This uncertainty came about because:

   a) a new logging cable (rated to 350°C) and new logging tool (rated to 500°C) could not be delivered.

   b) the Japex tool (temp., pressure, and flow) rated to 260°C (for leg 139) had not been shipped although the cruise was only 1 month away.

   This was of extreme concern to DMP and the Co-chief Scientists for the leg because of concerns for scientific return and safety (PPSP set a temperature limit of 350°C for drilling, a temperature that could not be measured!) DMP urgently recommended that the logging contractor obtain a memory tool for leg 139. [This was done and high temperature logging was successfully undertaken during the leg.]

In response to this report, LITHP made the following recommendation:

LITHP supports the acquisition of a memory tool for temperature measurements during upcoming legs. Even though drilling disturbs the formation temperatures, it is still a critical measurement. Acquisition of the tool should be accompanied by an effort to determine how to calculate formation temperatures from these measurements.

2) Fluid sampling at low and high temperatures remains a problem given the failure of the wireline packer. PCOM accepted a proposal from DMP (and endorsed by LITHP) for a workshop on fluid sampling. It was scheduled for August 23. This meeting was proposed to examine technical alternatives for sampling.

3) The Camborne School of Mines of the U.K. submitted a proposal to build a high temperature resistivity logging tool (rated to 350°C for 3-4 hours). Given the importance of such capability for upcoming EPR legs, DMP rated this proposal highest for the upcoming OPCOM meeting.

4) OPCOM priorities for technological development were determined as follows:
   a. High temperature resistivity tool with fluid resistivity and temperature capability
   b. Fluid sampling capability
   c. MAXIS 500 data acquisition analysis system (accelerated introduction to ODP)
   d. Sediment magnetic susceptibility tool
   e. High-resolution geochemical tool.

5) NSF is funding additional tests of Geoprops. DMP recommended that a full test (at sea) be made at least 2 legs before Geoprops is to be used on Cascadia (Leg 146). They recommended Chile Triple Junction (Leg 141) as the only logical chance.

6) A substantial presentation was made on geochemical tools. Particularly impressive was the discussion of the Enhanced Resolution Tool tested in the KTB hole in Germany. The potential of its capabilities are astounding, allowing detection of many more elements than the 8 (+ U, Th, K) now available. The tool is cryogenic and has less precision than present tools.

7) DMP has recommended that all re-entry holes include casing to basement to facilitate future wireline re-entry of the holes. Furthermore DMP encourages add-on proposals to restore and case holes 333A, 417A and 418A in the Atlantic [mostly for sedimentary studies].

1.6 Technology and Engineering Development Committee (D. Moos)

Operations summaries of Legs 134 through 139 were presented. Of primary interest to LITHP are: The **Motor Driven Core Barrel** recovered less than 10% of the weak carbonates cored on Leg 134; this and further Leg 135 testing resulted in a redesign (now completed) which will be tested on Leg 141. With the old design bit weight increased when the motor stalled, opposite to what you want. A low-friction hard-rock bit tested on Leg 136 cored rapidly but with poor recovery. Core trimmers have been redesigned and await testing (on Leg 140?). Hole 504B was cleared on Leg 137, but left some junk in the hole. The potential exists for high recovery with the **Diamond Core Barrel**, as 3.1 m cored recovered 80%, compared to 49 m cored at 15%. The **DCB** needs better weight on bit control, so it was suggested that the existing (passive) heave compensator be made active. The **CORK** system was deployed twice on Leg 139, and is in place at two sites with a thermistor string and a teflon fluid sampling tube in the hole. The **drill-in BHA** worked on the sulfide site. The **Pressure Core System** recovered two cores, one at pressure. Temperatures at one site reached 270°C, but tabs on the core-barrel recorded only 43°C, suggesting that circulation efficiently cools downhole equipment.

The DCS Phase II system is on track for delivery to Valparaiso (Leg 142) at the end of October. Safety tests were satisfactory. Bit life problems on Leg 132 have been mitigated by (1) thickening the diamond matrix (2) the now more experienced drillers.

The Leg 142 Prospectus calls for 36 on-site days, which are planned as follows: Locate hole (3 days); Drill-in cone and BHA 3-4 m (2 days); Set up DCS system (1 day); DCS core 4" hole, Slim-hole temp/caliper, Ream to 7.25", Optional logging, 2nd Stage drill-in BHA, Continue deepening w/ DCS. The Committee strongly recommended maximizing time with the DCS, rather than other proposed options such as the DCB.

An RFP sent to 6-7 companies and industrial affiliates for the DCS Phase III system resulted in two responses. One proposed a shipboard system, and one a seafloor system. The former is much more complicated and expensive, primarily because of the presence of the guide horn. The latter is safer and simpler, but harder to field service and the DCS compensator has to do all the compensation. Some concerns were raised about the compensator stroke (too short to compensate for vessel offset). Final proposals should now have been submitted, and it will be 18 to 24 months before installation. TEDCOM recommended having the guide horn removed, and asking for revised proposals, as this would make the shipboard system much cheaper, simpler, and possibly more rapidly implemented. A decision concerning removing the horn could be made by the end of March.

Two interesting developments in Russian Drilling Technology were presented: First is a (non-coring) tricone bit replaceable through drillpipe, thus good for bad hole situations or for drill-in casing. The second is a downhole motor with diamond bit and retractable reamers, used on the Russian ocean drilling tests and wireline retrievable with the core, reamers and bit. Again, bits could be changed without pulling pipe.

Deep Drillsite candidates were received from TECP (NB-3), SGPP (Proposal 061 Site C), LITHP, the Offset Working Group, and NARM DPG (its prospectus). The NARM prospectus was advertised as within the capabilities of the ship, but beyond anything yet done. J. Austin likened this exercise to a "ping-pong" game, as it has now been bounced around for more than a year with no substantive input from TEDCOM. It was suggested that a consultant be hired to design holes based on the existing descriptions.

G. Pollard presented a plan from TAMU Deep Drilling Studies for a 2-km hole to be accomplished with 100 days of drilling, into basalts under sediments, with multiple casing strings. The site had 200-500 m of nanno ooze (no loose sands), an average age of more than 2 Ma, good weather, low currents, and a firm, flat seafloor.

P. Worthington presented 5 ideas for an *in situ* pore fluid sampler: (1) use the existing tool without its packers, which are a concern because they seemingly don't deflate enough to get back into the pipe, (2) use drillstem straddle packers with a wireline sampler, (3) use a self-boring sampler, (4) use a fullbore straddle packer and gas lift, and (5) use (modified?) industry formation testers within a straddle packer.

Other issues included consideration of making the heave compensator active, so that the RCB can be used as an alternative to the DCS in some situations. Feedback is urgently needed from someone regarding feasibility and designs for the deep holes--especially what <u>cannot</u> be done. TEDCOM needs to be more pro-active, rather than re-active. One member felt that the current status (a few meetings a year without intervening work) was a waste of time.

1.7 <u>OPCOM</u> (S. Humphris)

The JOIDES Opportunity Committee (OPCOM) was set up at the April PCOM Meeting to discuss ways of using \$2.1M of additional funds that are to be made available in FY'92. This increase was viewed as a step function, rather than an anomalous spike, and hence is expected to continue in FY'93. These funds had arisen for three reasons. First, the original target budget for ODP for FY'92 had been \$41.4M, assuming six international partners and additional fuel costs. Since January 1991, when this budget had been determined, fuel costs had decreased, the USSR joined ODP, and an increase of 16-17% in NSF's budget was projected. Hence, NSF was willing to consider a \$2.1M incremental increase to bring ODP's budget to the figure of \$43.5M targeted in the Long Range Plan.

Panel Chairs and others presented ideas on how those additional funds should be used. OPCOM then produced the following recommendations for the next two years in prioritized order:

1) Accelerate development and testing of DCS, including:
   - attention to components (bits, core catchers, etc.)
   - cultivation of the necessary expertise
   - testing on land and at sea.

   Total: $1.9M

2) Continue development of logging and fluid sampling
   - purchase of a logging resistivity tool
   - conduct design studies for *in situ* fluid sampling

   Total: $0.5M

3) Commission a feasibility study on alternate (additional) platforms

   Total: $0.1M

The remainder should be used to:

a) allocate resources for use of alternate platforms, eg. Atolls and Guyot Legs, New Jersey Sea Level (if scheduled)

b) provide additional funds for support vessels for high latitude North Atlantic drilling.

In addition, OPCOM stressed the need to consider the implications for staffing in addressing these priorities.

The August PCOM Meeting reviewed these recommendations, and made an addition in light of the slow progress in determining deep drilling capabilities:

4) Commission a feasibility study to develop means of drilling holes 4-6 km deep, based on targets prepared by Panels.

   Total: $0.2M

LITHP is delighted that development of the DCS system is the top priority, and that PCOM recognizes the urgent need for this system in order to accomplish many of the LITHP objectives. LITHP also views the current formation fluid sampling and hydrologic property measurement situation as serious, and has made a strong joint recommendation with TECP concerning development of these capabilities (see Joint LITHP-TECP Meeting Minutes).

LITHP's other major concern is deep drilling, which is a critical aspect of its Long Range Plan. ODP presented their studies to TEDCOM in September, and expect to report to PCOM in December on the status of their studies.

LITHP endorses a feasibility study for deep drilling. It is disappointed with the lack of response by TEDCOM to the deep drill site submitted to them for consideration. For future planning, LITHP needs to determine

whether its goal of a continuous section through the oceanic crust is realistic in terms of time, technology and cost.

LITHP therefore recommends that a feasibility study be commissioned as soon as possible to evaluate the time, technology, and cost of drilling:

(i) a 4 km hole
(ii) a 6 km hole
in oceanic crust.

LITHP wants this assessment to culminate in a report as soon as possible, and will make one panel member--Dan Moos--available to work with a consultant whenever necessary. LITHP requests that other panels interested in deep drilling do the same, and would like a progress report at its March 1992 meeting.

2.0 SUPPLEMENTAL SCIENCE PROPOSALS

2.1 Proposal S-2: Downhole Measurements in Jurassic Oceanic Crust of Hole 801C

The primary attraction of the proposed logging in Hole 801C stems from the Jurassic age of the oceanic crust and the fact that the crust was accreted at a relatively fast spreading center. Logging Hole 801C, which penetrated 131 m of basement addresses several high priority LITHP objectives, including determination of the permeability of old oceanic crust, evaluation of the effect of alteration on porosity, measurement of *in situ* stress to help constrain tectonic models, etc. Hence, LITHP would like to see Hole 801C logged.

The objectives for drilling basement on Leg 144 are:

a) to define the ages of edifices
b) to define paleolatitudes
c) to define the geochemical composition in relation to the regional geochemical anomalies (DUPAL, SOPITA).

In order to accomplish the latter two, it is important to get enough inclination data to average out secular variations in paleolatitude determinations. In addition, recovery of a number of flows would be helpful in determining magmatic evolution. At present, the only basement drilling to any depth is scheduled on MIT Guyot, so LITHP does not wish to eliminate that site. LITHP also questions whether the geochemical objectives can be met with the logs as the fairly large uncertainties in the measurements are within the range of variation of basalts. Consequently, deployment of the geochemical tool is viewed as the lowest priority; the packer experiment being the highest.

LITHP supports logging of Hole 801C and its incorporation into Leg 144, and

is willing to give up 3.5 days of basement drilling to accomplish the logging programs. However, LITHP is not willing to give up planned basement drilling at MIT-1.

In terms of the logging, LITHP feels that the packer is of highest priority and the geochemical tool of lowest priority. Other logging should be done according to operational logistics.

2.2 Proposal S-3: Proposal for a Cased Hole with Re-entry Cone for Deployment of OSN Observatory

This proposal addresses high priority objectives as LITHP has supported the development of the Oceanic Seismic Network. The proposed location is good and falls within one of 20 high priority regions for OSN deployment because there are no land stations in this region.

When this proposal was first reviewed by LITHP, the time needed was estimated to be four days. Under that assumption, LITHP strongly supported drilling OSN-2. The revised time estimate of ten days means that a major component of drilling time would be taken from a program that has gone through detailed planning and review: LITHP finds this unacceptable.

LITHP considers it unacceptable to devastate Leg 145 by removing 10 days from its schedule, and feels this is a subversion of the planning process.

LITHP is willing to give up the lithospheric objectives of Leg 145 in order to drill OSN-2. In so doing LITHP notes the following:

- **there in not enough drilling of LITHP interest in Leg 145 to provide the necessary time to complete OSN-2**
- **the willingness of LITHP to accommodate drilling OSN-2 is due to Leg 145 not addressing high priority LITHP objectives**
- **LITHP strongly encourages development of a relation with the interested Japanese parties, and instrumentation of the Hole as soon as possible.**

3.0 PROPOSAL REVIEWS

3.1 The following proposals were determined to not fall within the mandate of LITHP:

348-Add	08/30	Upper Paleogene to Neogene Depositional Sequences on the U.S. Middle Atlantic Margin: The Mid-Atlantic Transect	K.G. Miller, G.S. Mountain, N. Christie-Blick
388-Add	09/06	Addendum to: A Proposal to Advance Piston Core the Ceara Rise, West Equatorial Atlantic: Neogene History of Deep Water Circulation and Chemistry (JOIDES Proposal 388)	W.B. Curry

391-Add	09/12	Depositional History and Environmental Development during the Formation of Sapropels in the Eastern Mediterranean	R. Zahn, E.A. Boyle, S.E. Calvert, G.J. de Lange, A. Mangini, A. Murat, F.G. Prahl, R.C. Thunell
398	02/22	Proposal for ODP Investigation of Quaternary Paleoceanography Near the Interface of the Gulf Stream and Labrador Current	D.J.W. Piper, P.J. Mudie, A.E. Aksu
404	09/11	Late Neogene Paleoceanography from Western North Atlantic Sediment Drifts	L.D. Keigwin, E.A. Boyle
405	09/12	Amazon Deep-Sea Fan Growth Pattern: Relationship to Equatorial Climate Change, Continental Denudation and Sea-Level Fluctuations	R.D. Flood, C. Pirmez, W. Showers, J.E. Damuth, P.L. Manley, R. O. Kowsmann, D. Peteet
406	09/11	North Atlantic Climatic Variability: Sub-Orbital, Orbital, and Super-Orbital Time Scales	W. Broecker, G. Bond, D. Oppo, S. Lehman, M. Raymo, T. van Weering
408	09/16	Northern Nicaragua Rise Drilling Proposal: Testing Two New Interpretations:	A. W. Droxler, A.C. Hine, P. Hallock, R Buffler, E. Rosencrantz,

3.2 Proposal 253-Rev

Paleoceanographic Controls on the Deposition of Organic Carbon-Rich Strata in the Ancestral Pacific (W.V. Sliter, M.A. Arthur, G.R. Brown, R. Larson, G.W. Brass)

This proposal does not address high priority objectives of LITHP. Its major emphasis is on understanding the origin of the middle Cretaceous sediments that are rich in organic carbon--a topic not within the mandate of LITHP. However, determination of the basement age of Shatsky Rise (50 m of basement penetration at three sites) and recovery of basement at one site on the Magellan Rise is proposed. The objectives of these sites are to evaluate the contribution of volcanism to the onset of organic carbon-rich deposition, and to test the triple-junction plume origin of Shatsky Rise.

The weakest part of this proposal from the LITHP viewpoint is the geophysical objective of estimating lower mantle viscosity through drilling at SHAT-2 and MAG-1. However, the Shatsky Rise transect may be more important than many other "touch basement" sites that have been proposed on other plateaus. The proponents need to strengthen the volcanic aspects of this proposal for it to be supported by LITHP.

3.3 Proposal 330-Add 2

Mediterranean Ridge: An Accretionary Prism in a Collisional Context (M.B. Cita and A. Camerlenghi)

This addendum points out the continued active program of site surveys in preparation for drilling on the Mediterranean Ridge. LITHP generally supports studies of the dynamics of accretionary prisms, and the Mediterranean Ridge is an interesting site. However, these goals are of secondary interest as presented in this proposal addendum.

3.3 Proposal 346-Rev 2 and Proposal 346-Add
Transform (Translational) Margin: The Ivory Coast - Ghana Transform Margin (Eastern Equatorial Atlantic) (J. Mascle, C. Basile, M. Moullade and F. Sage)
and
Complementary Information on Data Status (J. Mascle)

Most of the objectives are tectonic and sedimentological, and are not within the mandate of this panel. Some of the proposed drill sites are of secondary interest to LITHP and could be more fully developed by the proponents, particularly those located on oceanic basement or near the Romanche Fracture Zone. Of potential interest is IG2 with drilling through to oceanic basement. There is the potential for reaching basement at a number of sites and if this were included, this proposal may be of some interest to LITHP. However high priority objectives of LITHP are not addressed in this current proposal.

3.4 Proposal 356-Rev
Oceanographic and Climatic Changes Caused by Subsidence of Large Crustal Areas in the Denmark Straits, Jan Mayen Ridge and Iceland Faeroe Ridge area (P.P. Smolka and F. Strauch)

This proposal is to test models of the link between mixing of water masses and the subsidence of the lithosphere, and as such is the only of secondary interest to LITHP. This proposal would benefit greatly from coordination with the NARM drilling program, as it could provide an offshore continuation of a rifted margin transect.

3.5 Proposal 365-Add
Geothermal Measurements Along the Newfoundland and Iberia Conjugate Passive Margin Transects (K.E. Louden, J.C. Mareschal and J.P. Foucher)

This addendum proposes to elucidate the modes of continental rifting, and augment identification of the types of lithosphere underlying the passive margins by measuring temperature profiles within margin sediments.

The Panel is concerned that too many uncertainties exist in the modeling and that, even with calibration at these deep sites, the heat flow data may be too scattered to use as the sole basis for inversion. Furthermore, a new hole at Site NB-1 is not justified clearly enough to warrant the additional time required. The Panel also notes that the Sites identified in this addendum are not all included in the drilling plans presented by the NARM-DPG.

However, LITHP believes that the temperature data are very important, particularly in light of the modest amount of additional time required to obtain them. The potential of using heat flow to constrain the models, even if it cannot in itself answer the questions posed, is very high. Therefore, LITHP supports the collection of the heat flow data.

We encourage the proponents to contact members of the NARM-DPG to coordinate their proposal with that group by considering the Sites chosen by the DPG.

3.6 Proposal 369-Rev and Proposal 369-Add

Generation of Oceanic Lithosphere at Slow Spreading Centers: Drilling in the Western Wall of the MARK Area (C. Mevel, M. Cannat, J.F. Casey, J.A. Karson)
and
MK2: A Deep Hole in the Oceanic Upper Mantle at Slow-Spreading Ridge (C. Mevel)

The idea of drilling offset partial sections of tectonically exposed oceanic crust and mantle is a high priority objective of both LITHP and ODP (e.g. JOI/USSAC Workshop Report on "Drilling the Oceanic Lower Crust and Mantle and the formation of an Offset Drilling Working Group"). LITHP's current global rankings indicate not only our support for the offset drilling initiative, but also the potential suitability of the MARK area to address many of the offset drilling objectives. While LITHP is still very enthusiastic about the MARK area, we believe that this "revised/add" proposal still lacks sufficient enough maturity to receive our highest endorsement. This version, like the first submission, needs further development, especially in terms of relating the surface geology, both on and off-axis, to the proposed drill holes. The proponents need to put more effort into summarizing and evaluating the existing site survey data. This information should then be used to propose a set of specific petrologic and tectonic hypotheses which will be tested by drilling. In addition, care must be taken to demonstrate that any drilling results, no matter how unusual, can be successfully interpreted.

It is also important that survey data be interpreted to clearly understand the link between this anomalous outcrop and the surrounding oceanic crust. Near-bottom seismics and gravity data, and deep tow magnetics would be particularly helpful to determine whether this outcrop may, in fact, be a serpentine diapir.

LITHP encourages the proponents to submit another revised version. The panel firmly believes that the MARK region is still a site which offers an excellent opportunity to increase our overall understanding of how normal oceanic crust is generated and tectonically modified in a near-transform environment.

3.7 Proposal 376-Rev

Drilling at the VEMA F.Z. (M.A.R.): Layer 2/3 Boundary and Vertical Tectonics (J.M. Auzende, D.Bideau, E. Bonatti, M.Cannat, J. Honnorez, T. Juteau, V. Mamaloukas-Frangoulis, C. Mevel and H.D. Needham)

This proposal addresses two important objectives of LITHP. However, both the proposed sites still appear to have some deficiencies.

Site VE-1 is located to penetrate the 2-3 boundary. As before, the panel views the objectives regarding hydrothermal circulation as unlikely to be obtained. This would not appear to be the best place to pursue such a study. The greatest concern for the objectives regarding both the magmatic and hydrothermal character of the boundary, is the nature of the dike-gabbro contact. The boundary was not observed, and the cross section showing a simple "layer-cake" stratigraphy was not documented. If site survey data are sufficient to constrain those boundaries, those data should be discussed. If it is not, additional work is needed to identify the dip and orientation of that boundary. The possibility that the boundary is a fault or detachment surface cannot be dismissed. Some seismic data closer to the proposed site, which ties the site into regional crustal structure, is highly desirable.

Site VE-2 is viewed as extremely important. There is concern about the percent recovery in the limestones and the consequent loss of resolution in determining the paleodepth histories. LITHP recommends that someone with expertise in paleoceanography/bathymetry be formally involved in the proposal (the specific depth indicators to be expected should be discussed).

There is some question that the limestone section by itself would not be sufficient to identify the uplift history of the ridge, particularly the early part of that history. A set of short holes in different parts of the sedimentary section would produce a more complete picture of vertical motions. In that regard, there is no figure showing the distribution of sediments on the ridge, despite the fact that the site summary form indicates that some seismic data are available. The panel cannot evaluate the possible success of VE-2 without a better knowledge of the sedimentary cover.

In summary, site VE-2 addresses an important crustal problem, but requires more detailed development. Site VE-1 addresses a high priority target, but a better case needs to be developed for the nature of the dike-gabbro boundary, and the objectives rethought in light of the different possibilities for the structure of that boundary.

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3.8 Proposal 380-Rev 2

Drilling into the Clastsic Apron of Gran Canaria: Evolution of a Coupled System Volcanic Ocean Island - Sedimentary Basin (H.U. Schmincke, U. Bednarz, S. Cloetingh, A. Freundt, P.v.d. Bogaard, P Weaver, W. Weigel, G. Wissmann, J.J. Danobeitia, S. Radomski and K. Hoernle)

LITHP recognizes that the concept explored in this proposal, i.e. determining ocean island evolution by studying reverse stratigraphy in clastic aprons, is very powerful and an interesting idea of considerable interest to the Panel. However, as for previous versions of this proposal, it is not clear that this is the best location for this study. Although the Canary Islands are unusual in the duration of volcanism exposed on land for study, the contemporaneous volcanism on all the islands will not allow resolution of the volcanism associated with each island.

Of particular concern to LITHP are the following problems:

1) biostratigraphy may be difficult, as the biogenic component of the sediments will be diluted.
2) the seismic data suggest there are some large slumps which should be avoided. However, GLORIA will identify only surface slumps.
3) it may not be possible to distinguish between material originating on different islands due to subaerial input.
4) there may be a sampling bias towards the more explosive rock types, which are the less voluminous.

It is clear that drilling would result in information that is otherwise unobtainable, but the questions are very ambitious, and it is not clear that they can be answered.

3.9 Proposal 397

Mantle Plume Interaction With Melting During Lithospheric Extension - Multiple Rifting in the Tertiary North Atlantic Region (J. Skogseid, S.T. Gudlaugsson, T. Prestvik and K. Gunnarsson)

This proposal focuses on drilling a transect across the West Jan Mayen Margin in order to test models of volcanic margin development. Of particular interest to LITHP are Sites 3 and 4 which would allow determination of the geochemical characteristics of the volcanism during and after breakup. More emphasis should be placed on constraining the timing and possible role of the Jan Mayen mantle geochemical anomaly in the Miocene rifting event that the proponents wish to investigate.

This project is valuable in the context of the proposed rifted margin drilling, and could prove to be the next step in the Atlantic Rifted Margin program.

3.10 Proposal 399

Tectonic Evolution of the Alboran Sea (A.B. Watts, J.P. Platt and B.C. Schreiber)

This proposal addresses fundamentally important questions, some of which are of key interest to the LITHP. However, the proposal is weak in the linkage to the extensive data base in the Betics. The proposal also fails to adequately address the existing offshore industry data extensively documented and discussed by the proposal 323 on the Alboran Basin by Comas *et al.* In 1990 the proponents of 323 organized an international workshop which reflected a large body of work to be published shortly in a special volume of Geomarine Letters.

Although the present proposal builds on a valuable seismic reflection survey carried out in 1988, it is immature and incomplete by its failure to link the general questions to the specifics of the drilling area.

The proponents are urged to consider joining the 323 proposal group thereby avoiding unnecessary and undesirable duplication of a well advanced drilling initiative.

3.11 Proposal 400

Proposal for the Ocean Drilling Program for Determination of Mass Balance and Deformation Mechanisms of the Middle America Trench and Accretionary Complex off Costa Rica (E.A. Silver, T.H. Shipley and K.D. McIntosh)

LITHP is interested in this proposal, particularly in the component of the complex that is eventually subducted. This is particularly useful for geochemical fluxes, and this example is better constrained than many other possible locations. We suggest moving Site CR2 to drill through the decollement surface.

The proposed fluid studies need more detailed explanation as it is not clear what hypotheses are to be tested, and how will they be done. Furthermore, some expansion of the methods used to determine the age of the accreted vs. subducted materials would be helpful.

The composition of the underplated and downgoing slab portions of the accretionary zone are of major interest to LITHP, and inclusion of these studies in a revised proposal is important.

3.12 Proposal 401

Evolution of a Jurassic Seaway, Southeastern Gulf of Mexico (R.T. Buffler and G. Marton)

Although continental rifting processes are of interest to LITHP, only site SE-2 will possibly reach basement. The Jurassic paleoceanography objectives are not within the mandate of LITHP.

3.13 Proposal 402

The Geochemical Anomaly in MAR Basalts between 12°-18°N (A.V. Sobolev, L.V. Dmitriev and H. Bougault)

The proposal addresses an important problem concerning temporal and spatial heterogeneity of lavas that is of considerable interest to LITHP. However, the Panel feels that the first order problems of the age of onset of the anomaly and its spatial distribution can be best addressed by an off-axis sampling program. There is no evidence presented that suggests that the vertical geochemical heterogeneity that may be encountered in a drill core will not be equivalent to the horizontal heterogeneity suggested by dredging. Drilling may be premature until a dredging/submersible/rock drill sampling program is completed.

LITHP encourages the proponents to develop this further, with a possible connection to proposal 407 (Dick *et al.*)

3.14 Proposal 403

Proposal to Drill the KT Boundary in the Gulf of Mexico (W. Alvarez, J. Smit, E.M. Shoemaker, A. Montanari and R.T. Buffler)

Although not within the mandate of LITHP, the Panel reviewed this proposal because it has objectives that could result in exciting (and high visibility science). The stated goals are to drill at 6 Sites in the area of the Chicxulub structure to recover proximal deposits of the impact.

LITHP believes that the scientific questions to be addressed in this proposal are extremely interesting, and the proponents have put forward some good arguments for using drilling to learn about the impact. However, there are some technical questions that still remain:

1) could this horizon be drilled on land?
2) will the biostratigraphy be able to clearly resolve the timing of the K-T extinction?
3) is the recovery using APC and XCB going to be sufficiently better at DSDP Sites 536 and 540 to answer the questions posed?
4) is the location of the transect optimally placed? Additional seismic work in the area might result in better Site locations.

LITHP encourages the proponents to involve scientists from Mexico in this project, and to develop this project further.

3.15 Proposal 407

Offset Drilling in the North Atlantic Shallow Mantle at a Geochemical Anomaly (H.J.B. Dick, L. Dmitriev, H. Bougault, G. Thompson, M. Tivey, P. Kelemen, J. Casey, S. Silantiev)

This proposal addresses high priority objectives of LITHP. Offset drilling of oceanic crust and mantle was highly ranked by LITHP and the site proposed is of interest, particularly because of the regional geochemical anomaly and the presence of dunite. The presence of dunite makes this site particularly useful for comparison to ophiolites. The "non transform" setting of this site is useful for comparison to "normal" oceanic crust, but is not unique to this site. It is not clear that there is sufficient information to locate the proposed drill holes for optimal results. Mapping by dredge hauls is a necessary first step, but is not sufficient for site survey requirements. Further mapping of the area is strongly encouraged. In particular, the structural and geophysical data necessary to relate the exposed rocks to adjacent oceanic crust and mantle are not presented, and probably have not been obtained. The Offset Drilling Working Group will consider both petrologic and structural data in recommending the areas most suited for scientific drilling of deep oceanic crust and mantle. The area near the 15° 20'N fracture zone will be given serious consideration by the working group, but additional details on the geological and structural setting of this site are needed to prioritize the various proposed sites.

4.0 RANKING OF PROPOSALS IN THE NORTH ATLANTIC PROSPECTUS

In response to the concern over the potential influence of proponents on panel rankings, LITHP reviewed their situation. Five (out of fourteen) members of the Panel were proponents on proposals and were identified:

M. Cannat	P. Herzig
S. Cloetingh	S. Humphris
J. Franklin	

This meant that a quorum of the international partners could not be maintained if all proponents were excluded from the voting procedures.

Other concerns included:

1) the strength of the Panel is its diversity; by removing five members, the balance of expertise would not be maintained

2) corporate memory concerning many of the proposals would be lost--especially as five of the remaining nine were attending only their first or second meeting.

3) the Panel has a commitment to promote the best Science--removal of those who are interested and most closely involved could jeopardize that commitment and introduce bias.

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LITHP strongly believes that the methods used in the past two years have been equitable; however, additional guidelines have now been added to ensure that there is no influence of proponents on the voting procedures.

The following guidelines were used during the procedure:

1) proponents were absent for the initial discussion of their proposals

2) proponents were not permitted to eliminate any proposal from the voting

3) during the general discussion preceding voting, proponents were not permitted to respond to comments or questions concerning their proposals. (At one point, a panel member felt the need for a prolonged discussion about a proposal, and the proponents were asked to leave.)

4) proponents could not vote for their own proposals, so the total number of votes were divided by the number of panel members permitted to vote

5) ranking was done by written vote, which was tallied by the ODP representative

6) all voting sheets were signed and have been kept as part of the record of the meeting.

During discussion prior to ranking, the following decisions were made:

1) no new proposals were added
2) the following proposals or Legs were eliminated as not within the interests of LITHP:

Proposal Number	Region/Objective
323-Rev and 399	Alboran Basin - Leg 2; Paleooceanography
348	New Jersey Sea Level
391	Mediterranean sapropels

3) the multi-leg proposals were reduced to one Leg each for FY'93. LITHP accepted the recommendations of the NARM-DPG as to the top priority for each of volcanic and non-volcanic rifted margins. TAG was reduced to one Leg, although LITHP believes the priorities need to be reviewed. Offset Drilling was reduced to one Leg; LITHP feels the WG needs to recommend the best location.

Once the Legs to be ranked had been identified, each panel member assigned their rankings for the nine Legs--proponents did not rank their own proposals: The data are listed below:

Rank	Proposal	Total # Votes	# Members Voting/ Total Votes Possible	Percent
1	TAG	85	11/99	85.9
2	Volcanic Rifted Margins - Leg I	107	14/126	84.9
3	North Atlantic Offset Drilling - Leg I	104	13/117	82.5
4	Non-volcanic Rifted Margins - Leg I	95	14/126	75.4
5	VICAP	60	13/117	51.3
6	Alboran Basin	55	14/126	43.7
7	Equatorial Atlantic Transform	51	14/126	40.5
8	Mediterranean Ridge	37	14/126	29.4
9	NAAG - Leg I	30	14/126	23.8

As a result of this procedure, and the need for continuation of the TAG and Offset Drilling planning processes, LITHP makes two recommendations to PCOM:

A. **LITHP recommends that a TAG-DPG be set up immediately (whether or not drilling is scheduled in FY'93) to:**

   i) **examine all available data to determine the locations of appropriate drilling sites and their priorities**

   ii) **consider the structural controls ont he hydrothermal systems and determine how to address those through drilling.**

Nominations for Chairperson (in priority order):

1. John Hamilton (Canada)
2. Ross Large (Australia)
3. Rob Zierenberg (U.S.)

Nominations for members of a TAG-DPG:

G. Thompson (WHOI)
L. Zonenschain (USSR)
L. Kong (Japan) - or other seismologist who has worked at TAG
J. Franklin (Canada)
J. Karson (Duke) - or other structural geologist
P. Rona (NOAA)
Maurice Tivey (WHOI)
ODP Engineer

B. **LITHP recommends that the next meeting of the Offset Drilling Working Group be specifically charged with developing an initial drilling strategy for the Atlantic and laying out a provisional schedule for Atlantic drilling. This may require both an extra day of meetings, plus involvement of those proponents with interests specifically in the Atlantic. If offset drilling is scheduled for FY'93, this may better be handled by a North Atlantic Offset Drilling Detailed Planning Group. LITHP expects a progress report at its March meeting.**

5.0 OTHER BUSINESS

5.1 Panel Replacements

Jason Phipps-Morgan and Guy Smith are due to rotate off the Panel. Guy will serve for one more meeting. Jason has provided a great deal of help and a unique perspective; LITHP thanks him for his dedicated service.

LITHP recognizes the need for an individual with expertise in modeling, which Jason has brought to the Panel. Consequently, the Panel suggests:

1. Marc Parmentier
2. Roger Buck
3. Doug Wilson

(None have yet been contacted.)

5.2 Next Meeting

The next LITHP meeting is scheduled for 18-20 March 1992, and will be held in Davis, CA Jim McClain has kindly agreed to host the meeting.

000485

LITHTECP MTG
NICOSIA, CYPRUS
OCT 9-11, 1991

ODP DEEP DRILLING STATUS

* GENERIC SCIENTIFIC DEEP DRILLING TARGET DATA RECIEVED
* ODP STUDIES PRESENTED TO TEDCOM IN SEPTEMBER 91
* TEDCOM TO PREPARE LIST OF QUALIFIED CONSULTANTS
* DRAFT REPORT ON ODP HARDWARE CAPABILITIES COMPLETED
* ODP TRIPLE CASING HANGER SYSTEM UNDER REVIEW
* COMPUTER MODELING OF CASING PAYLOADS IN PROGRESS
* RECOMMENDATION FORTHCOMING FOR FALL PCOM MEETING

000486

ODP TECTONICS PANEL MEETING

NICOSIA, CYPRUS

OCTOBER 9-11, 1991

RECEIVED
NOV 1 1 1991
Ans'd............

EXECUTIVE SUMMARY

1. OPCOM MONEY:

OPCOM has recommended feasibility studies for deep drilling, and TECP places very high priority on deep drilling on rifted continental margins. Therefore TECP requests that specific attention be directed toward drilling improvements that would increase the efficiency of drilling, enhance core recovery, and increase the ultimate likelihood of success at deep sites such as those proposed for North Atlantic rifted margins.

2. SUPPLEMENTAL DRILLING PROPOSALS

A. HOLE 801C: TECP places high priority on the logging of hole 801C. TECP's main interest in legs 143 and 144 is in questions of plate kinematics. These involve the preservation of a latitudinal spread of basement penetrations. TECP believes that the time alloted to Atolls and Guyots is generous. If something must be cut, however, TECP recommends that basement penetration be sacrificed in mid-latitude sites, preserving the maximum latitudinal spread of basement samples.

B. S-3--Drilling of hole OSN-2. Establishment of the global seismic net is extremely important for the long-term objectives of TECP, of ODP, and, indeed, of the global geoscience community. We strongly support the drilling of OSN-2.

Concerning what should be dropped from leg 145 to make time, we offer the following. Tectonic objectives are secondary on leg 145, but TECP does have interests in obtaining basement ages at the ocean floor sites and age and paleolatitude information at the seamount sites. If necessary, we would give up any time that might have been devoted to these objectives. However, we do feel that some of the potential tectonic objectives are more important than others, so TECP lists the following priorities, from lowest to highest:

Lowest: Information from seamount site PM1 and sea floor sites NW1A and NW4A are least likely to produce tectonically significant results.

Intermediate: Basement information from NW3A is likely to produce tectonically significant sesults for models of North Pacific plate evolution (Chinook plate hypothesis) so it is of medium priority.

Highest: On Detroit seamount (DS sites) significant basement penetration supplying paleolatitude and age information is very important for models of Pacific plate motions, as well as for global questions concerning true polar wander and fixity of hotspots. Thus these sites are of high priority to TECP.

3. PROPOSAL/ PROSPECTUS REVIEW.

TECP reviewed all 26 new proposals and re-reviewed appropriate proposals in the North Atlantic Prospectus. In keeping with PCOM's requirements, proponents were absent from the room during discussion and grading of proposals. Then TECP discussed the NARM DPG report from the tectonic point of view. Both Co-Chairs of the DPG were absent from this discussion.

4. TECP RANKING OF NORTH ATLANTIC PROSPECTUS LEGS

RANK	PROPOSAL	SCORE
1	NARM NON-VOLCANIC FIRST LEG (IAP 4, 2, and 3A, and GAL 1)	7.4
2	NARM VOLCANIC FIRST LEG (EG 63-1 and 63-2)	6.1
3	346 Rev 2 Transform Margin (Ivory Coast-Ghana Margin)	5.7
4.	323 Rev Alboran Sea (Comas et al)	4.8
5.	403 K/t boundary, in the Gulf of Mexico, Alvarez et al /	4.0
6.	376 Layer 2/3 boundary, Vema F.Z.	3.2
7	369 Rev MARK Area	2.5
8	399 Alboran Sea (Watts)	2.3

5. LETTERS OF INTENT.

TECP suggests that the present "Letter of Intent" process should be strengthened and somewahat formalized. We suggest that letters of intent should be encouraged (e.g. by advertisement in JOIDES Journal, or publications with broader readership, such as EOS, GSA Today, or Terra Nova), all thematic panels should receive the letters, and the authors should receive a written response. This latter could include suggestions for additional proponents, experts to be consulted, and/or details of data sources. Encouragement from thematic panels at the critical stage may also help with funding of related site surveys, etc.

6. OFFSET DRILLING

TECP recommends that either a Detailed Planning Group be formed or that the Working Group be charged with the task of coming up with a coherent, balanced proposal for Atlantic offset drilling. This proposal should include an integration of tectonic and lithospheric themes, and it should include all the site survey and geological setting information outlined in the Offset Drilling Working Group minutes.

7. WATCHDOGS

Stimulating exciting tectonics drilling objectives is one of the TECP's main concerns. To foster this, TECP's watchdogs on various thematic issues are starting to take a more active role in enhancing communication between the panel and proposal proponents.

JOIDES TECTONICS PANEL MEETING, OCTOBER 9-11, 1991
NICOSIA, CYPRUS

MINUTES

PRESENT:	Eldridge Moores, UCD Chairman Tanya Atwater, UCSB Steve Cande, Lamont-Dougherty Jeff Karson, Duke U Hans-Christian Larsen Alain Mauffret, France (substitute for J. Bourgois) Casey Moore, UCSC Yujiro Ogawa, Japan Mike Purdy, WHOI Tim Reston, GEOMAR (substitute for K. Hinz/J. Behrman) Alistair Robertson, UK Dale Sawyer, Rice U Phil Symonds, Australia Mark Zoback, Stanford U.
LIAISONS	Shirley Dreiss SGPP James Allen, ODP John Mutter, PCOM S. Cloetingh, LITHP Liaison (present during joint meeting)
VISITORS	Fred Vine, Chair Offset drilling W. G. Mike Storms, ODP
APOLOGIES:	K. Klitgord, USGS

LIAISON REPORTS

SGPP Shirley Dreiss discussed the recent SGPP meeting. Considerable frustration was expressed about the status of tool development, especially permeability and pore pressure measuring devices, as well as with the mechanics of choice of Co-Chief Scientists.

TEDCOM Moores reported on the TEDCOM meeting he attended in the stead of Dale Sawyer. He reported that TEDCOM was very interested in pore pressure information in sites such as the model deep-drilling sites presented by TECP (CAscadia, Barbados, and Newfoundland Basin). Casey Moore and Dale Sawyer will provide pore fluid pressure information to Moores on convergent and rifted continental margins, respectively, for forwarding to TEDCOM.

OPCOM Moores reported on the OPCOM meeting, emphasizing the list of proposed items to concentrate on. After considerable discussion, mainly concerning the desirability of Deep Drilling, TECP unanimously passed the following recommendation to forward to PCOM

> **OPCOM has recommended feasibility studies for deep drilling, and TECP places very high priority on deep drilling on rifted continental**

margins. Therefore TECP requests that specific attention be directed toward drilling improvements that would increase the efficiency of drilling, enhance core recovery, and increase the ultimate likelihood of success at deep sites such as those proposed for North Atlantic rifted margins.

LITHP Jeff Karson reported that there had been no meeting of the Lithosphere Panel since the Davis TECP meeting.

OTHER LIAISONS TECP discussed the desirability of liaisons with other panels.

OHP Alastair Robertson and Tanya Atwater agreed to serve as liaisons to European and North American meetings, respectively.

TEDCOM Dale Sawyer is TECP liaison.

DMP Casey Moore? Mark Zoback? agreed to serve as official liaison

SUPPLEMENTAL DRILLING SITES

S-2. Logging of Hole 801C

TECP unanimously passed the following motion:

TECP places high priority on the logging of hole 801C. TECP's main interest in legs 143 and 144 is in questions of plate kinematics. These involve the preservation of a latitudinal spread of basement penetrations. TECP believes that the time alloted to Atolls and Guyots is generous. If something must be cut, however, TECP recommends that basement penetration be sacrificed in mid-latitude sites, preserving the maximum latitudinal spread of basement samples.

S-3. Drilling of hole OSN-2.

After discussion of the issues, TECP unanimously passed the following motion:

Establishment of the global seismic net is extremely important for the long-term objectives of TECP, of ODP, and, indeed, of the global geoscience community. We strongly support the drilling of OSN-2.

Concerning what should be dropped from leg 145 to make time, we offer the following. Tectonic objectives are secondary on leg 145, but TECP does have interests in obtaining basement ages at the ocean floor sites and age and paleolatitude information at the seamount sites. If necessary, we would give up any time that might have been devoted to these objectives. However, we do feel that some of the potential tectonic objectives are more important than others, so TECP lists the following priorities, from lowest to highest:

Lowest: Information from seamount site PM1 and sea floor sites NW1A and NW4A are least likely to produce tectonically significant results.

Intermediate: Basement information from NW3A is likely to produce tectonically significant sesults for models of North Pacific plate evolution (Chinook plate hypothesis) so it is of medium priority.

Highest: On Detroit seamount (DS sites) significant basement penetration supplying paleolatitude and age information is very important for models of Pacific plate motions, as well as for global questions concerning true polar wander and fixity of hotspots. Thus these sites are of high priority to TECP.

REVIEW OF NEW PROPOSALS.

Proposal review began with a discussion of "conflict of interest" questions as outlined by John Mutter in the PCOM report. It was felt that members who were on the panel because of their expertise should not be "gagged". The idea of a quorum was questioned, as these panels are not a legalistic body. The opinion was expressed that it was the American contingent imposing its paranoia on the rest. Concern was expressed that these restrictions are turning thematic panels into an NSF-like proposal review agency, rather than an advisory body.

Despite these reservations about the process, TECP in its discussion and voting of new proposals scrupulously followed the instructions from PCOM. Specifically, proponents were not in the room during discussion or voting on their proposal. DPG chairs also were not in the room during discussion of the DPG report from the tectonic point of view.

253-Rev Paleoceanographic controls on the deposition of organic carbon-rich strata in the ancestral Pacific

This proposal primarily addreses paleoceanographic objectives in its emphasis on the origins of Pacific C_{org}–rich sediments. However, the postulated superplume, the origins of oceanic plateaus, and the Cretaceous magnetic quiet period are all of vital interest to TECP. The likelihood that the proposed drilling will establish the temporal relationships among these events and of them to other oceanographic and climatologic changes is extremely exciting. We note that the success of the proposed work is entirely dependent upon great improvements in coring and recovery in the cherty Cretaceous sediments and upon dependable penetration to and into basement volcanic rocks. It should not be attempted until these drill technological improvements are proven and routine. Hopefully they will be by the time that t;he drill ship returns to the Pacific. We look forward to continued updating of this proposal. If the proponents would like to discuss TECP's reactions further, we invite them to contact the appropriate "watchdogs", namely Steve Cande and Tanya Atwater.

Box checked: 4

330-Add2 Mediterranean Ridge: an accretionary prism in a collisional context

The Mediterranean ridge constitutes a lithologically unique accretionary prism in a collisional setting. A viable drilling program across the Mediterranean ridge needs to be supported by multichannel seismic data both to geologically constrain the sites and address safety issues. The present proposal mentions many topics of current interest in the study of accretionary prisms, including structural history and fluid evolution. For the Mediterranean ridge proposal to be competitive, the topical significance of these objectives must be developed and closely integrated from site to site. Essentially the proposed drilling program needs to be more coherent than it is currently.

We understand that the Mediterranean Ridge will be the subject of a multichannel seismic study led by Jean Mascle and Jean-Pierre Rehault. The proponents of this proposal should contact the French group to integrate more MCS data i;nto any forthcoming Mediterranean Ridge drilling proposal. For further information about TECP's reaction to this proposal, please contact Phil Symonds or Casey Moore, TECP's watchdogs in this topic.

Box checked: 4

346-Add Complementary inforamtion on data status on proposal for drilling in the Atlantic transform margin.

This addendum is also included in proposal 346-Rev. TECP considers; proposal 346-Rev to be mature and ready to be drilled. It addresses high priority TECP objectives. We suggest that drilling time estimates (using the ODP guidelines) be assembled and that the proposal divided into legs and prioritized. Continue the processing efforts that you describe in the proposal.

Box checked: 5

346 Rev 2 Transform (translational) margin: The Ivory Coast-Ghana transform margin.

In its review, TECP reaffirmed its strong interest in the tectonic objectives of this proposed leg and continues to believe that this area is the best location to carry out a study of transform margins. The panel noted with approval the international effort being made to obtain additional geophysical and submersible (site survey) data. Some concern was expressed at the delay in providing the improved processed seismic refraction data, and it is hoped that this could be speeded up. Major concern was expressed that the proposal includes deep drilling objectives amountint to 2-3 legs. We suggest that drilling time estimates (using the ODP guidelines) be assembled and that the proposal divided into legs and prioritized. Continue the processing efforts that you describe in the proposal.

Box checked: 5

348 Add Upper Paleogene to Neogene depositional sequences on the U.S. Middle Atlantic margin: the Mid-Atlantic transect.

This is an excellent proposal, with much new data. It should produce a definitive study of relative sea level changes on a passive margin. Unfortunately, as the proposal is formulated, there is no theme of interest to the tectonic panel.

Box checked: 1

356 Rev Oceanographic and climatic changes caused by subsidence of large crustal areas in the Denmark straits, Jan Mayen Ridge, and Iceland-Faeroe Ridge area.

This proposal is mainly targeted at OHP interest. There is, however, a mention of vertical crustal movements of the prominent aseismic ridges and highs in the northeastern Atlantic, structures that exert very important oceanographic (and paleoceanographic) control. The hypothesized rapid vertical crustal movements of these features and the possible connection to intra-plate stress changes is briefly addressed as a potential tectonic objective. TECP appreciates the potential of this hypothesis, but in doing so, does not see this theme developed or substantiated enough that we can classify the proposal as addressing (*sensu stricto*) a high-priority tectonic objective. Part of the proposed study area is very close to highly-ranked volcanic margin drilling, and TECP accordingly would like to be informed if sites of this proposal are scheduled for drilling. If so, TECP would consider the need for deepening of some of the sites to include volcanic basement, especially on the Iceland-Greenland Ridge.

Box checked: 2

361 Rev A proposal for drilling an active hydrothermal system on a slow-spreading ridge: MAR 26° N (TAG)

TECP continues to be very interested in the potential for drilling into fault rocks during the deeper penetrations planned for this site. The muting of magnetic anomalies is improtant to the panel for severl reasons elaborated in the proposal, but particularly because alteration is likely to be closely tied to faulting. TECP is disappointed, however, at the omission of any discussion of structural questions in this revised proposal, particularly as the Panels previous comments were essentially ignored. The mere mention of a relationship between the mineralization and structure does not constitute taking structural questions into account. No consideration of the structural environment was made in discussion of the objectives of the drilling. TECP notes that if this proposal is drilled without adequate structural expertise in the scientific party, a great opportunity will be lost. For further information about TECP's reaction to this proposal, please contact Jeff Karson, TECP's watchdog on this topic, or the panel Chair.

Box checked 3.

365 Add Geothermal measurements along the Newfoundland and Iberia conjugate passive margin transects.

TECP strongly endorses the importance of heat flow and heat production measurements in the NARM drill holes (should they be drilled). However, there are severe problems with this proposal. The panel was unconvinced by the data and modelling presented that the basic premise of the proposal was valid. High heat flow data points along the Goban Spur were somewhat arbitrarily discounted and for both profiles the crust was interpreted to be radiogenically deplited, which undermines the basic premise of the modelling. Perhaps more serious is the problem that simple shear models were never discussed and contrasted with pure-shear models, so that it was not clear if distinctions between these models could be determined from heat flow data.

The panel does suppor the proposal to deepen NB1-A to basement, nor does it explicitly support the recommendations for HPC or WSTP runs. Instead the panel hopes that careful oversight by DMP would assures that the goals of accurate heat flow and heat production measurements would be met..

For further information about TECP's reaction to this proposal, please contact Dale Sawyer or Hans-Christian Larsen, TECP's watchdogs on this topic,

Box checked: 4

369 Add MK2: a deep hole in the oceanic upper mantle at slow spreading ridge

This proposal is a further elaboration of 369Rev. The proposal for a long hole in peridotite is presumably in response to the Offset Drilling W. G. preliminary report. TECP questions what the hole will add, particularly in view of the fact that site 670, leg 109 drilled 100 m of peridotite only a few miles away, and the proposed hole has not been placed within a suitable site-survey framework. The theme of magnetic properties of peridotite is of considerable interest, however.

Box checked: 3

369 Rev Generation of oceanic crust at slow-spreading centers: drilling in the western wall of the MARK area

This proposal is of appreciable interest to TECP, but is very immature and highly deficient. The drilling of hole MK-1 and its relation to detachment faulting is an important tectonic goal. However, the location of the fault (or other faults) is not shown on the maps, and the overall structural relations to be tested are not presented at all. Considering the appreciable amount of information available for this area, the PI's have not yet taken the opportunity to develop the case for drilling. Errors, such as the fact that MK-1 is not located at the same place on the map and cross-section, indicate that the proposal was hurriedly prepared. We realize that such was the case, in order to meet the PCOM deadline after the Offset Drilling W. G. meeting. We recommend that the proposal be extensively revised and resubmitted, taking advantage of the additional geological and geophysical data available for this region. For further information about TECP's reaction to this proposal, please contact Jeff Karson, TECP's watchdog on this topic, or E. Moores, Panel Chair.

Box checked: 4

376 Rev Drilling and the VEMA F. Z. (MAR): layer 2/3 boundary and vertical tectonics.

TECP recognizes the addition of some tectonic considerations in this revision. The proponents should consult the panels guidelines (JOIDES Journal, V. XVII, No. 2, June 1991, p. 58), particularly with respect to the interpretation(s) of the proposed drill sites. The proponents should consider other permissible interpretative cross-sections and the implications for drilling targets. It is recognized that drilling may be the besto or only way to constrain this structure.

The panel is very interest in the origin of transverse ridges. We recognize these as fundamentally important components of the oceanic lithosphere that remain very poorly explained. While the proposal lists many current hypotheses, the proponents do not explain how the data acquired from sibsidence history or other data would test or eliminate any of these hypotheses.

This proposal has the potential to be one of the highest-ranked oceanic drilling projects for TECP. For further information about TECP's reaction to this proposal, please contact Jeff Karson, TECP's watchdog on this topic, or E. Moores, Panel Chair.

Box checked: 4

380 Rev 2 Drilling into the clastic apron of Gran Canaria; Evolution of a coupled system volcanic ocean island-sedimentary basin

As with the previous version of this proposal, TECP recognised this to be an excellent study of an oceanic mid-plate volcano. It addresses two issues of tectonic interest: the lithosphere subsidence, loading, re-heating question; and the early history/reconstruction of the central Atlantic Ocean. The drilling program has obviously been designed aimed primarily at unravelling the important story contained in the volcaniclastic apron around Gran Canaria, and in this it seems an excellent plan. Although the issues of lithosphere subsidence/loading/reheating are described in the proposal, no adequate explanation or description is provided, however, of specifically how the drilling results will be used to answer these problems. And no account is provided of how the very difficult separation between the effects of horizontal stresses and vertical loading will be made.

The one hole in the Madeira Abyssal plain has potential tectonic interest because of its potential to provide a basement date within the Cretaceous magnetic quiet zone and thus help in early reconstructions of the Atlantic. But it is located within a fracture zone trough, and the offset on that fracture zone is necessarily unknown (because there are no identifiable magnetic anomalies), so any dating will have some inherent uncertainity. The hole thus will be of limited utility.

Box checked: 3

388 Add Addendum to: A proposal to Advance Piston Core the Ceara Rise, western Equatorial Atlantic: Neogene history of deep circulation ahd chemistry.

This proposal is to address problems of Neogene circulation. As its proposed sites have been selected to be as tectonically stable as possible, there is no objective of tectonic interest addressed.

Box checked: 1.

391 Add Depositional history and environmental development during the formation of sapropels in the eastern Mediterranean.

The objectives of this proposal are mostly paleoceanographic. There is little of interest to TECP.

Box checked: 1

397 Mantle plume interaction with melting during lithosphere extension--multiple rifting in the Tertiary North Atlantic region

The tectonics panel considered this proposal of interested in defining the history of magmatism and rifting associated with plume evolution. Members noted the need to obtain geochemical data from this area. The panel believed that early history of rifting might be better defined elsewhere. Some expressed interest in the rifting of the Jan Mayen ridge as a process of microcontinent formation. Overall the proposal was ranked below other North Atlantic rifted margin programs. For further information about TECP's reaction to this proposal, please contact Hans-Christian Larsen, TECP's watchdog on this topic,

Box checked: 4

398 Proposal for ODP investigation of Quaternary Paleoceanography...Gulf Stream and Labrador Current off the Grand Banks of Newfoundland.

The objectives of this proposal are not within the TECP mandate. We suggest that the proponents of 398 provide evidence that the proponents of 363A and 359A agree to the movement of their site.

Box checked: 1

399. Tectonic evolution of the Alboran Sea.

This succinct and well-focused proposal to examine the development of intracontinental extensional basins in a collisional tectonic setting addresses the general TECP theme of understandint deformation processes at convergent plate boundaries. Although the global significance of this type of basin development is covered to some extent within the proposal, TECP considers that this question deserves further emphasis and clarification.

The case for drilling in the Alboran Sea and the general questions that can be answered by drilling are clearly argued in the proposal. TECP feels, however, that because the significance of the extensional process comes from their position within a collisional system, effort needs to be made to expand the regional geology component of the proposal to include information on the nature and age of structures within the surrounding thrust belts. <u>TECP believes that it is the link between collision and extension that needs to be emphasized, and not just the nature of extensional processes within the basins of the Alboran Sea</u>. We ask that the following specific suggestions be borne in mind during any further planning and/or revision of the proposal:

1. The proposal needs some review of other data in the region relevant to understanding the devleopment of the Alboran Sea, such as the near-shore exploration wells and the large network of seismic data. For example, the proposal would benefit from the addition of subsidence curves from these wells, particularly those in the Miocene grabens; these would give an indication of the extent to which drilling will be able to constrain the subsidence history of the grabens.

2. The proposal needs a clear structural element map of the Alboran Sea. Structure contour and isopach maps showing the distribution of "megasequences" between the proposed sites would also be helpful.

3. The proposal needs a simple "schematic" section illustrating the general setting and structural style of the Alboran Sea basins, and their relationship to the surrounding thrust belts. Presentation of larger segments of seismic data (compressed scale sections) across the whole Alboran province would also help better to locate the proposed sites within the regional setting.

4. Is there a better site for penetrating the <u>full</u> syn-rift section, thus constraining the initiation of extension?

5. Some re-think of the site seismic interpretations and their ambiguities is required. For example, will sites A_2, A_4, and A_5 really intersect basement? There appears to be significant reflectors below the proposed TD's at these sites, particularly cutting across the multiple at site A_2. Also, some of the seismic data, particularly at sites A_4 and A_5, requires migration to reduce interpretation ambiguity.

6. Can basement be dredged on the scarps in the vicinity of sites A_4 and A_5, perhaps negating the need for basement penetration?

It is clear that important collisional tectonic objectives can be addressed in the Alboran Sea. TECP believes that timely progression to a mature driling proposal for the region can most efficiently proceed by the proponents collaborating with those of the original Alboran Sea proposal (323 Rev, Comas and others), which has already been reviewed several times by TECP.

TECP is interested in your response to this review, and invites you to consult with our "watchdog" for collisional margins: Phil Symonds (Bureau of Mineral Resources, GPO Box 378, Canberra, A.C.T. 2601 Australia; Tel: 06-2499490; fax 06-2576041).

Box checked: 4

400 Proposal...for determination of mass balance and deformation mechanisms of the Middle America Trench and accretionary prism

TECP agrees that determination of the mass balance in accretionary prisms is of fundamental tectonic significance. The Costa Rican convergent margin is probably the best place to carry out this experiment because of the lack of a trench wedge (suggesting uniform input) and a continuous slope cover (preventing loss of prism by erosion.

The Panel raised several issues that could be addressed in a revision of the proposal:

1. What is known about the Cocos-Caribbean plate kinematics over the expected duration of accretion (0-20 Ma)?

2. Does the magmatic arc in Costa Rica show any evidence of sedimentary input to the magmas?

3. Does the localized uplift of the Nicoya peninsula reflect the subduction of some irregularity that could have been associated with a substantial variation of sediment input to the prism?

The seismic data is of high quality and constrains prism geometry and structure well. The proposed objectives of deformation mechanisms and the effects of fluids on prism deformation would be well-supported by measurements of surface heatflow to test for fluid flow around out-of-sequence thrusts, the frontal thrust, and the mud volcano. Examination of geochemical gradients in piston cores might also help constrain fluid movement. There is probably too much drilling proposed, and choices will have to be made.

If you have any questions regarding this review, please contact Casey Moore, the Tectonics panel watchdog in this area.

Box checked: 4.

401. Evolution of a Jurassic seaway, southeastern Gulf of Mexico

TECP members were impressed by the exemplary presentation and illustration of this interesting proposal. Members agreed that the study of transform rifted margins involves fundamental processes that are currently poorly understood and thus of considerable geneeral interest. The proposed area is already well-studied with readily available site survey data. TECP was concerned, however, about several aspects of the proposal:

1. The area is extremely complex and the transtensional setting of the proposed drill area could be model-dependent. How certain are we that transtensional tectonics were operating?

2. It is unclear that this area is necessarily the best suited for the study of fundamental processes of transtensional rifting. Putential results might, therefore, be significant mainly in the regional Caribbean context.

3. All six proposed sites reuqire more than 1,500 m of penetration and amount to four months' drilling time. This commitment may exceed the likely benefits of the leg's stated objectives.

If you have any questions regarding this review, please contact Alastair Robertson, the Tectonics panel watchdog in this area (translational margins)

Box checked: 3

402 The geochemical anomaly in MAR basalts between 12° and 18°N.

The tectonics panel recognizes a number of potentially interesting aspects of the proposal that are not strongly emphasized. These include: 1) plate boundary reorganizations aroung a ridge-ridge-ridge triple junction; 2) fracture zone processes: and 3) spreading center-related extensional tectonics. Should additional site survey or other data indicate that these topics can be investigated in detail as part of the proposed drilling program, TECP could be more enthusiastic. Especially if peridotites are to be drilled, TECP urges that the structural and tectonic guidelines of the panel (JOIDES Journal, V. XVII, No. 2, June 1991, p. 58) be given serious consideration for the planning and execution of the proposed holes.

403 Proposal to drill the KT boundary in the Gulf of Mexico

TECP viewed this very interesting proposal as perhaps not in its White Paper, but perhaps it should be. The question of plume-generated eruptions vs impact as a triggering mechanism of plate motion has been raised in the case of the Indian Ocean, and the question is possibly of even more general importance. Everyone, even TECP, is interested in the nature of major extinction events. The journalistic importance of this proposal is extremely high, and the proposal could be t;he most important site that ODP can drill. Several questions were raised about the amount and location of the drilling sites, with the opinion expressed that perhaps one or two sites would be adequate.

Box checked: 5.

404 Late Neogene Paleoceanography from western North Atlantic

The proposal is entirely focused on late Neogene deep sea sediment sections and ahas no tectonically relavent themes.

Box checked: 1

405 Amazon deep-sea fan growth pattern: relationship to equatorial climate change, continental denudation, and sea-level fluctuations

This proposal is for a test of the Vail Exxon model of sea-level fluctuations, relating Amazon fan deposition to uplift of the Andes. As written there is no theme of interest to the Tectonics Panel.

Box checked: 1

406 North Atlantic climatic variability: sub-orbital, orbital, and super-orbital time scales:

This proposal for drilling a number of very shallow holes in regions of fast sedimentation rate has no theme of interest to the Tectonics Panel.

Box checked: 1.

407 Offset drilling in the North Atlantic shallow mantal at a geochemical anomaly

TECP has two areas of concern regarding this proposal--one related to developing TECP interest and the other related to the effect; of tectonics on LITHP interests:

1. The tectonic interest in this proposal lies in the character of the detachement fault mentioned. We would like to see this subject developed. No cartoon or model was included to show possible orientations of this fault or its role in the exposure of the mantle rocks. TECP considers seismic data to be very important in placing drilling results into a regional context. We would also like to see a direct connection between the proposed penetration of the detachment and the solution of a significant tectonic problem, *i.e.*, just drilling througha fault doesn't mean that we will learn a great deal about tectonic processes. What would you observe or measure? We believe that TECP concerns can be addressed in this area, but they must be discussed in more detail to attract our interest.

2. Our second concern relates to the role of tectonic processes in exposing the mantle rocks. If the stratigraphic setting (in an offset ocean drilling sense) of the rocks to be drilled is not bettter established, we fear that the proposed sites will acquire little more than a bunch of rocks from somewhere in the mantle. The tectonics of the exposure should be better understood to provide this stratigraphic setting.

Qustions or comments our our discussion can be addressed to our "watchdog" on mid-ocean ridge processes--Jeff Karson.

Box checked: 3

408 Northern Nicaragua rise drilling proposal: testing two new interepretations

This proposal is focused on the development of carbonate platforms and circulation systems in the northern Nicaraguan Rise area. Although the proposal recognises significant tectonic and structural control on platform development, it does not attempt to address any high-priority TECP objectives. The tectonic development of the region is complex and still appears to be poorly constrained. Several TECP members were dubious about the relationship of the proposed extensional phase--suggested to have been responsible for segmentation of the platform in the middle Miocene--to a change in the configuration of the Caribbean-North American plate boundary.

Box checked: 2.

RE-REVIEW OF PROPOSALS IN NORTH ATLANTIC PROSPECTUS

In keeping with the instructions from PCOM, TECP re-reviewed the proposals within its mandate in the North Atlantic Prospectus that had not been incorporated into the fore-going reviews.

323 Rev. The Alboran Basin and the Atlantic-Mediterranean gateway...

This proposal addresses the relationship between compressional events on land and extensional "collapse" in the Alboran Basin. They present great onshore data, involving timing and shortening. There is a great deal more data being collected now, including MCS, heat flow, seabeam, Gloria, paleomagnetics. The proposal would benefit greatly with being combined with 399. In addition the proposal proponents need to address the suggestions made by TECP during the last review. For further information about TECP's reaction to this proposal, please contact Phil Symonds, TECP's watchdog on this topic,

Ranking: 4

330 Mediterranean RIdge: An accretionary prism in a collisional context.

This proposal addresses a very important issue, in that every accretionary complex on land went through a stage like this one. Thus it provides and actualistic window into a process of great importance in geologic history, not just in terms of modern oceanic processes, even though the physical properties vary from one wedge to another. The proposal still is immature, though we are aware that writing and data acquisiton goes on apace. We are aware of new Russian data around Cyprus and new French data on the ridge, itself. We recommend combining of the various groups and data sets to produce an outstanding proposal. Salt is a safety problem that needs to be addressed. For further information about TECP's reaction to this proposal, please contact Phil Symonds, TECP's watchdog on this topic.

Ranking: 4.

DISCUSSION OF NORTH ATLANTIC RIFTED MARGINS DPG

N.B. During this discussion both Co-Chairs of the NARM DPG were absent from the room.

TECP commenced its discussion of the North Atlantic Prospectus by a discussion of the tectonic aspects of the proposal of the North Atlantic Rifted Margins Detailed Planning Group. There was overall consensus that the proposed legs and priority order outlined by the DPG were acceptable for discussion and ranking purposes. The panel members generally felt that the volcanic rifted margins were more well-studied than non-volcanic rifted margins. The primary interest with volcanic rifted margins seems to be history and evolution of the plume and its interaction with crustal formation processes. The dating schemes proposed for the volcanic rocks seem questionable to some panel members. Regarding the non-volcanic rifted margins, the Iberian side seems especially well prepared and ready for drilling. There is some question about the readiness of legs 2 and 4 in the

Newfoundland basin. More data seems in the offing. There was a question why there was no palinspastic reconstruction, or no attempt to construct a balanced cross-section. It may not be possible, but one should at least try.

RANKING OF NORTH ATLANTIC PROSPECTUS PROGRAMS

Procedure: Proponents of proposals were permitted to be present during voting and to vote on all but their own proposals. Eight legs were selected by consensus by TECP for ranking. Each panel member voting ranked their choices in a list, giving 8 points to their first choice, and 1 to their last. Panel members with conflicts of interest so indicated on their paper ballot. The total for each leg was tallyed and then divided by the number voting. Both Co-Chairs of the NARM-DPG elected not to participate in the voting.

TECP RANKING OF NORTH ATLANTIC PROSPECTUS LEGS

RANK	PROPOSAL	SCORE
1	NARM NON-VOLCANIC FIRST LEG (IAP 4, 2, and 3A, and GAL 1)	7.4
2	NARM VOLCANIC FIRST LEG (EG 63-1 and 63-2)	6.1
3	346 Rev 2 Transform Margin (Ivory Coast-Ghana Margin)	5.7
4.	323 Rev Alboran Sea (Comas et al)	4.8
5.	403 K/t boundary, in the Gulf of Mexico, Alvarez et al /	4.0
6.	376 Layer 2/3 boundary, Vema F.Z.	3.2
7	369 Rev MARK Area	2.5
8	399 Alboran Sea (Watts)	2.3

PANEL MEMBERSHIP

The panel discussed membership questions. Three U.S. members of the Tectonics panel are coming to the end of their terms. Ordinarily a panel member rotates off after 6 meetings, but the JOIDES Office has expresed the desire to regularize terms to end with the calendar year. U. S. Panel members who have completed their fifth meeting with this meeting are Kim Klitgord, Mike Purdy, and Dale Sawyer. Klitgord has expressed a desire to be replaced, and he has missed the last two meetings. On the other hand, Purdy and Sawyer have actively participated in all meetings, and are mainstays in our rifted margin contingent. Given the fact that the focus of ODP is moving towards rifted margins in the Atlantic, TECP requests that Purdy and Sawyer stay on the Panel for a sixth meeting. They both have expressed their willingness to do so. The panel nominates the following persons as panel members:

Rifted Margins

Priority	Name
1	Charlotte Keene
2.	Chris Beaumont
3.	Mike Steckler
4.	Gerard Bond

In addition the panel feels itself deficient in the following two areas and has nominated the appropriate persons listed for membership.

Physical Mechanisms of Deformation

1. Sue Agar
2. Carol Simpson
3. Jan Tullis

Collisional-Small Ocean Basin (Caribbean-Mediterranean) questions

1. Leigh Royden
2. Neil Lundberg
3. J. Pindell
4. Paul Mann
5. Roy Kligfield
6. John Suppe

LETTERS OF INTENT

Vanneste: H-C Larsen commented that the Thulean Plateau is a very interesting tectonically.

Hsü Considerable discussion ensued concerning this letter. The Panel agreed that there is a need to reinforce the mechanism for encouraging protential proponents to put forward exciting new ideas for drilling. Stimulating exciting tectonics drilling objectives is one of the panels main concerns. To achieve this TECP suggests that the present "Letter of Intent" process should be strengthened and somewahat formalized. We suggest that letters of intent should be encouraged (e.g. by advertisement in JOIDES Journal, or publications with broader readership, such as EOS, GSA Today, or Terra Nova), all thematic panels should receive the letters, and the authors should receive a written response. This latter could include suggestions for additional proponents, experts to be consulted, and/or details of data sources. Encouragement from thematic panels at the critical stage may also help with funding of related site surveys, etc.

OFFSET DRILLING

TECP discussed the disappointing nature of the proposals for offset drilling. The suggestion was made that either a Detailed Planning Group be formed or that the Working Group be charged with the task of coming up with a coherent, balanced proposal for Atlantic offset drilling. This proposal should include an integration of tectonic and lithospheric themes, and it should include all the site survey and geological setting information outlined in the Offset Drilling Working Group minutes. If a DPG is formed, potential members with structural-tectonic expertise include Bob Varga, Jean M. Auzende, Brad Hacker, Perter Lonsdale, John Hildebrand, Doug Toomey, Jack Casey, Marty Kleinrock, Sue Agar.

WATCHDOG REPORTS

1. Transform Margins--Alastair Robertson

The request for proposals from the ODP office produced only two that are currently "active": 275-Rev (Gulf of California) and 386-Rev (California margin). Panel members expressed considerable interest in stimulating improved proposals in these cases, particularly to study continental-oceanic crust interaction problems, e.g. transform propagation into continental crust, modes of continental sliver detachment, i.e. terrane initiation, or fault coupling of transform/spreading ridge intersections in space in time. Concerning the California borderland, TECP wondered if safety requirements greatly limited drilling potential. Finally TECP noted the complete absence of current proposals to study other transform settings, e.g. trench-trench transforms.

2. Plate history, sealevel change, magnetic questions-Tanya Atwater, Steve Cande

No action.

3. Young rifted margins--Dale Sawyer

No action, but see North Atlantic DPG report!

4. Old rifted margins--Hans-Christian Larsen.

The requested proposals received included ones for the Red Sea, the south Australian margin, the Antarctic margin, Bransfield Strait, and the Woodlark Basin. The Red Sea proposal is outdated and there are political problems. The Antarctic margin is heavily sedimented and the proposal is very immature. Bransfield Strait has similar problems. The South Australia margin site has real potential, as sediments are not thick. Woodlark basin is interesting because of its possible tie to ophiolites and the relationship between the continent-penetrating propagating rift and the on-land metamorphic core complex. We should encourage the proponents of the Woodlark and South Australia proposals to revise and update their proposals.

5. Mid-Oceanic Ridges--Jeff Karson

The Offset Drilling Working Group is reviewing all the appropriate proposals. Some areas need proposals. Some proposals need work. Stay tuned.

6. Marginal Basins--Yujiro Ogawa.

Convergent margins were the subject of several recent legs (125, 126, 127, 128). There are few outstanding proposals. With regard to future planning, little is known about back arc or forearc settings. Need deeper holes, coherent cross-sections, oriented cores to get at dynamics of system.

7. Convergent margins--Casey Moore.

There is concern about fluid measurements on the Cascadia leg. The CoChiefs are writing a response to the concerns in the prospectus. Barbados will come in again. Also Peru.

8. Collisional margins--Phil Symonds

There are eight active proposals--seven in the Mediterranean and one on the north Australian margin. The Mediterranean proposals include accretionary prism, back arc basin (Tyrrhenian Sea), and extensional basin (Alboran Sea) problems. We need to encourage proponents carefully to address exactly what drilling will do to resolve these problems. The north Australian margin is a good possibility for the future. It is probably the only place in the world where one can study an incipient foreland basin by ODP drilling. It will provide information on craton deformation in a convergent-collisional system. The foredeeps and basins produced by this deformation are an important class of basin, and they should be a part of the TECP white paper..

9. Stress and mid-plate deformation--Mark Zoback

There is a need for routine deployment of the borehole televiewer to get breakout information for stress determination. Probably most holes are not deep enough for meaningful measurements. The best is hole 504B, which surprisingly is in a highly compressive stress field.

The panel empowered the watchdogs to communicate on behalf of the panel to the various proponents of the promising proposals or areas and encourage them to update or improve their proposals. A model letter is as follows:

Dear .

The Tectonics Panel of the Ocean Drilling Project has, in the course of its deliberations, reviewed your proposal for drilling in __________. The Panel is trying to encourage the preparation and submission of outstanding proposals in areas of its high priority themes. We believe that a well-formulated, mature proposal attacking the major questions in this region would address our high-priority theme of ________.

You should understand that the Tectonics Panel only makes <u>recommendations</u> to the Planning Committee, which schedules drilling. The process is <u>very</u> competitive, but we see real potential for eventual drilling in your area and would like to see it developed further. The following specific suggestions are intended to assist you in this process:

1.
2.
3.
(etc.)

Sincerely yours,

____
TECP Watchdog for _________.

The Panel also decided to invite the proponents of proposals ranked 4 to communicate with the appropriate watchdog.

NEXT MEETING

Las Vegas (?) Nevada, after a 2-3 day field trip to look at continental rifting and detachment faulting. Tanya Atwater to host. Tentative date March 19-23, 1992

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Ans'd...........

JOINT LITHOSPHERE PANEL-TECTONICS PANEL MEETING
NICOSIA, CYPRUS
9-11 October 1991

EXECUTIVE SUMMARY

2.0 LIAISON REPORTS

2.2 North Atlantic Rifted Margin Detailed Planning Group Report

After reviewing all the proposals for drilling passive margins in the ODP files, the NARM-DPG concurred with PCOM's decision to concentrate rifted margin drilling in the North Atlantic at this time. The DPG report proposing 8 Legs of drilling was generally well received by the Panels.

LITHP and TECP are concerned about the ability to date the volcanic rocks from these margins accurately enough to achieve the desired precision in the proposed spreading rate determination.

2.3 Offset Drilling Working Group Preliminary Report

LITHP and TECP noted a bias in the target areas selected from 22 possible locations by the WG towards fracture zone sites. Fracture zones are their own tectonic environments and do not represent faulted segments of "normal" oceanic crust.

There is a critical need for site surveys. A key site survey goal should be to identify boundaries away from the exposure, so the relation between the exposed section and "normal" crust can be determined.

5.0 DOWNHOLE LOGGING AND SAMPLING

5.1 Fluid Sampling

LITHP and TECP jointly believe that the current inability to sample formation fluids and measure pore pressure, permeability and temperature, including in slim holes, is jeopardizing the success of the program, especially such legs as Cascadia and EPR II. We strongly urge that a group be formed immediately to investigate and resolve this problem using OPCOM money for tool development.

Beyond this immediate crisis, LITHP and TECP strongly feel that an integrated strategy is required to develop the routine ability to make such measurements in the various geologic environments of concern to each of the thematic panels.

5.2 Downhole Logging Measurements

A major lack in downhole measurements is the determination of bulk density. This would require substantial modification of existing tools.

6.0 TECP - LITHP COMMON OBJECTIVES

TECP and LITHP will consider putting out a joint RFP in U.S. and non U.S. publications for proposals that address coupled volcanic-tectonic systems. Another way to encourage proposals that address both Panels' objectives would be ODP-sponsored symposia at AGU, GSA and EGU meetings specifically on drilling for volcanic and tectonic objectives.

At present, LITHP and TECP feel that their interests are well represented on both Panels, and the current liaisons are appropriate.

7.0 PROPOSAL SUBMISSION DEADLINES

TECP and LITHP jointly urge the JOIDES office to set a submission deadline sufficiently in advance of the panel meetings (six weeks?) so as to ensure that all panel members receive copies of appropriate prospectuses and/or proposals in time to read them, and so that panel chairs do not have to routinely resort to expensive express mail and courier services.

8.0 JOINT MEETINGS AND FIELD TRIPS

All members of LITHP and TECP agreed that joint meetings that include a pre-meeting field trip, as this one did, are extremely valuable in enhancing coordination between the panels, improving communication, etc. The panels agreed to try to schedule a joint meeting every year or one and one half years. These joint meetings should be preceded by carefully selected field trips that ideally visit on-land examples of topics of high common interest.

JOINT LITHOSPHERE PANEL-TECTONICS PANEL MEETING
October 9-11, 1991
Nicosia, Cyprus

1.0 INTRODUCTION

Eldridge Moores opened the joint meeting with LITHP, and welcomed the Panels to Nicosia. Moores outlined the history of the meeting, and introduced George Constantinou, Andreas Panayiotou, and Costas Xenophontos, General Director, Exploration Director, and Senior Geologist, respectively of the Geological Survey of Cyprus. Constantinou spoke a few words welcoming the Panels to Cyprus. The Panels jointly passed a motion of thanks to the Geological Survey of Cyprus, and especially to Costas Xenophontos for his invaluable assistance in meeting and field trip arrangements. At the suggestion of Susan Humphris, Chair of LITHP, the Panels passed a motion of thanks to Eldridge Moores, John Malpas, and Alastair Robertson for their work on the field trip.

2.0 LIAISON REPORTS

2.1 PCOM Report (J. Mutter)

Operations of the *JOIDES Resolution* are now determined through Leg 147. Co-Chief Scientists have been selected as far as Leg 146, and staffing has been completed through Leg 144. Leg 140 is currently underway, and Hole 504B was reached about six days ago. On arrival, the FMS was run and several parts of it (an arm, bowspring and two orthogonal pads) were dropped in the Hole. Fishing operations have begun to try to recover the junk.

(M. Storms reported later in the meeting that after five unsuccessful fishing trips, the core barrel and some other junk had been recovered using a tool fabricated on board. Milling operations had begun, and coring was expected to begin on 14 October. The FMS is expected to be repaired and operational for Leg 141.)

The primary business of the Hannover meeting in August was to assemble the North Atlantic prospectus for consideration by the thematic panels at their fall meetings. In addition, PCOM heard that the overall NSF budget will probably increase by 17.5%. The JOI budget of $43.5m is about consistent with the funding requested in the Long-Range Plan. Logistical support for Antarctic research has shifted from NSF to DOD, thus increasing flexibility.

EXCOM has expressed concern about the balance of non-U.S. and U.S. Co-Chief Scientists. The balance is figured over one year, probably too short a time interval, but as it is, the U.S. has too many Co-Chief Scientists. The Memorandum of Understanding is that there be half U.S. and half other partners. Germany is the country in greatest deficit. Decisions concerning Co-Chief Scientists are made by the Science Operator (T. Francis) on the basis of nominations from thematic panels to

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PCOM, and recommendations from PCOM. The intention is to involve the advisory structure in the decision-making process, and an effort is made generally to have a proponent as one of the Co-Chief Scientists.

There is a great deal of optimism that the program will be renewed for the next five years, especially now that the USSR has joined. A turning point will come in 1998 when the contract on the *JOIDES Resolution* ends. There is considerable debate concerning appropriate future drilling platforms, especially as Japan is planning a vessel for deep drilling objectives, and the Europeans are also planning a ship and working on better coring techniques. Panel input is needed on what capabilities ODP might require in the future.

The purpose of the December PCOM meeting will be to construct the FY'93 drilling schedule, which will consist of six legs (either six science legs or five science and one engineering leg). Their decision will be based on thematic panel input with guidance from the Site Survey Panel. Consequently, the principal purpose of the thematic panel meetings is to provide advice to PCOM on the FY'93 schedule. Recommendations should be based upon the North Atlantic Prospectus (which is itself based on prior global rankings), and any new, highly ranked proposals. The top two or three proposals in each panel's ranking are all that really count. In dealing with multi-leg projects, each proposed leg is to be ranked. In addition, DPG and WG reports are to be reviewed, not rubber-stamped. Scheduling of one leg of a multi-leg project does not commit to others; however, it will produce a certain momentum for a given area for a given theme, and could act against new proposals in the same thematic areas.

During ranking and voting procedures, PCOM recommends that proponents not be present, and discussions should take place while they are absent. However, a quorum must be present at all times of both U.S. and non-U.S. members. There was considerable discussion of this requirement to the effect that it made the task impossible, and Panels were not sure what to do. This was more of a problem for LITHP than TECP at this meeting because of differences in the number of proponents on the two panels. It was recommended that the Panels devise a scheme that allows for fair discussion of rankings while excluding any proponent influence.

Supplemental science proposals have been discontinued, but single hole proposals, which can be fitted into regular legs during the planning stages, will still be accepted. There are two outstanding supplemental science proposals that the Panels should consider:

a. drilling OSN-2: requires 10 days out of Leg 145
b. logging Hole 801C: requires 3 days out of Leg 144

PCOM needs Panels to determine what drilling <u>in their thematic areas</u> would be worth eliminating in order to accomplish these objectives.

The Performance Evaluation Committee (PEC III) has had three meetings. The principal issues raised concern the balance of Co-Chief Scientists, overcrowding on the *JOIDES Resolution*, and whether decision-making is, or should be, top-down or bottom-up.

OPCOM met once to determine how to use the $2.1m additional money to be provided by NSF. Priorities include:

a. diamond coring system development
b. special tools development (eg. fluid sampling)
c. evaluation of alternative (or additional) platforms
d. a feasibility study for deep drilling (this was added by PCOM at its August meeting)

Fluid sampling is still a serious problem: the Geoprops tool will not be available for Leg 141 (Chile Triple Junction) and it is highly unlikely it will be ready for Leg 146 (Cascadia). During Leg 143 (Atolls and Guyots), a test of shallow water drilling will be conducted at Enewetak.

PCOM has decided to institute a limit to the lifetime of proposals. Those that are inactive for three years will be withdrawn for further consideration. The problem of submission of addenda, and how this affects a proposal's activity record still needs to be resolved.

EXCOM has expressed concern about the perceived lack of focus of the program, and has asked for feedback on the possibility of focussing the program on a few subjects.

2.2 North Atlantic Detailed Planning Group Report (H.C. Larsen and D. Sawyer)
The NARM-DPG was mandated by PCOM to produce a coherent program investigating the processes of continental rifting in two settings:

1) thinned and faulted, non-volcanic margins
2) thick volcanic-rich margins, where the dominant deformation is flexural, and strain rates are about ten times as high as in the thinned and faulted settings.

The DPG reviewed all proposals for passive margins in the ODP files, and concurred with PCOM's decision to concentrate passive margin drilling in the North Atlantic at this time because:

a) the North Atlantic volcanic margins are typical of this type world-wide
b) the North Atlantic is one of the few regions in the world where continental flood basalts can be related to break up
c) the North Atlantic is the only place where a plume originally located beneath the rift axis is still beneath the spreading center--thus the

relationship between breakup, current volcanic activity, and distance from the plume center can be investigated in detail

d) the rifted margin is a good choice because a conjugate margin pair is present. The sediments are not too thick, and complexities, such as salt diapirism, are not present.

After consideration of 12 proposals representing 25 legs of drilling, the NARM-DPG produced an 8-leg program of high priority drilling in two regions--a completely faulted, non-volcanic conjugate margin to the south (Newfoundland Basin and the Iberia Abyssal Plain), and the volcanic-rich region of the East Greenland margin to the north, where there is no evidence for asymmetrical development, and the relations between variations of evolution of the margin in relation to the distance from the hotspot axis can be investigated. The DPG proposes a long-term strategy of drilling, with two legs per year for four years.

For the southern rifted, non-volcanic transect--the Newfoundland Basin and Iberia Abyssal Plain, investigation of a conjugate set is necessary because the margins are not symmetrical, and bulk simple shear is the dominant process. The DPG suggests four legs in priority order:

Leg I — Three holes in the Iberia Abyssal Plain (IAP 4, 2, and 3A) to investigate post and synrift sediments, and to sample the thinned continental crust and oceanic crust, and one hole in Galicia Bank (GAL 1) to sample a suspected peridotite ridge outcrop.

Leg II — A deep hole (2450 m) in the Newfoundland Basin (NB4) to penetrate the sediment cover and sample the synrift sediments and the (thinned continental?) crust beneath.

Leg III — A deep hole (2550 m) in the Iberia Abyssal Plain (IAP 1) to sample a conjugate setting similar to NB4, by penetrating post-rift sediment, breakup unconformity, synrift sediments, and basement.

Leg IV — Holes NB1 and NB7, to sample oldest oceanic crust (NB7) and subsidence and breakup history on the continental margin (NB1).

A series of 4 legs are also proposed for drilling on the East Greenland, volcanic-rich rifted margin. Evidence suggests that a plume developed a few m.y. before breakup, producing a huge sequence of seaward-dipping reflectors. The plume is still present beneath Iceland allowing comparison of original vs. present effects. The proposed legs are:

Leg I — Two sites to begin the East Greenland transect at 63°N, to sample a simple set of seaward reflectors at the distal end of a plume in order, among other objectives, to date the sequence to refine the data on the rate of spreading.

Leg II Site EG63-3 and a site on the Voring margin where there is local structural deformation.

Leg III Continuation of the East Greenland 63°N transect.

Leg IV A transect of the East Greenland margin at 66°N to look at the development of the margin at another location along the plume.

Considerable discussion ensued about the methods of dating volcanic rocks. Many doubts were raised about the ability to date the volcanic rocks accurately enough to achieve the desired precision in the spreading rate determination.

2.3 Offset Drilling Working Group Preliminary Report (F. Vine)

This Working Group met for the first time in August. Five principal guidelines resulted from the initial discussion:

1) The first phase of drilling should be restricted to target areas within the main ocean basins, with the aim of establishing the crustal section and crustal processes associated with mature, mid-ocean ridges.

2) The emphasis should be on siting holes which start at a stratigraphic level within the lower part of Layer 2 or below.

3) Holes drilled within an offset drilling strategy would by 1000 ± 500 m in depth; hence, they do not represent deep drilling.

4) A program of 8-10 years should be devised, involving 10-12 2-month legs and 15-18 holes with the following estimates:

a) Layer 2/3 boundary	2 legs
b) Layer 3 long sections	2 legs
c) Layer 3/4 boundary (Moho)	4 legs
d) Layer 4 long sections	2 legs
e) Active transform fault	1 leg
f) Median Valley master fault	1 leg

5) A two-phase program is envisaged. Phase I (2-3 years) would involve drilling at sites which can be identified on the basis of existing site survey information and are good prospects for the second phase of drilling. Phase II would focus on a limited number of locations.

The WG identified 22 potential target areas as follows:

A. Slow-spreading ridges

(i) Sections exposed on transverse ridges formed within the inside or transform corner of ridge-transform intersections

1. Atlantis II F.Z. (SW Indian Ocean Ridge)
2. Vema F.Z. (Atlantic Ocean)
3. Kane F.Z. (Atlantic Ocean)
4. Hayes F.Z. (Atlantic Ocean)
5. Oceanographer F.Z. (Atlantic Ocean)
6. Kurchatov F.Z. (Atlantic Ocean)

(ii) Sites within the median valley

7. 15°20'N (Atlantic Ocean)
8. MARK area (Atlantic Ocean)
9. 45°N (Atlantic Ocean)

(iii) Section exposed by extension of pre-existing crust

10. Kings Trough (Atlantic Ocean)

(iv) Section exposed by thrusting of pre-existing crust

11. Gorringe Bank (near Gibraltar), a complex tectonic scenario, now compressive, formerly strike-slip.

B. Fast-spreading ridges

(i) Exposures associated with fracture zones

12. Blanco F.Z. (NE Pacific)
13. Siqueiros F.Z. (E. central Pacific)
14. Garrett F.Z. (E. central Pacific)
15. Eltanin F.Z. (South Pacific)
16. Nova Trough (8 km deep at west end of Clipperton F.Z.)
17. Udintsev F.Z. (South Pacific)

(ii) Sections exposed by crustal extension ahead of propagating ridges

18. Hess Deep (beyond Galapagos ridge)
19. Pito Deep (margin of Easter microplate)
20. Endeavour Deep (margin of Juan Fernandez microplate)

(iii) Section exposed by late-stage extension on an abandoned ridge crest

21. Mathematicians Ridge (E. central Pacific)

(iv) Section exposed by thrusting of pre-existing crust

22. Mussau Trough (east margin of Carolinas plate, in a tectonic setting apparently similar to Gorringe Bank) (W. Pacific)

The WG then constructed a matrix of the 22 potential target areas against 20 objectives of offset drilling. This resulted in the following rankings:

6 highly ranked areas	Watchdogs	6 promising areas	Watchdogs
*Atlantis II F.Z.	H. Dick	Pito Deep	B. Taylor
*Vema F.Z.	C. Mevel	Endeavor Deep	J. Phipps-Morgan
*15°20'N	H. Dick	Garrett F.Z.	J. Fox
*MARK	C. Mevel	Siqueiros F.Z.	J. Casey
Kings Trough	J. Cann	*Blanco F.Z.	P. Robinson
*Hess Deep	J. Natland	Oceanographer F.Z.	J. Fox

*Areas that might feature in Phase I of an offset drilling program.

There is a critical need for site surveys. The drilling is not as dependent on development of the DCS as previously feared--much can be achieved within the current drilling capabilities.

Comments from the Panels included the bias in the target areas towards F.Z. sites which are anomalous. Fracture zones are their own tectonic environments and do not represent faulted segments of "normal" oceanic crust. A key site survey goal should be to identify boundaries on exposed walls and trace them into seismic boundaries away from the exposure. It is possible that porosity plays a more important role in such seismic entities than petrologic differences.

3.0 REPORTS ON RECENT AND UPCOMING LEGS

3.1 Leg 136 (M. Storms)
During drilling of OSN-1, a new PDC core bit was tested. Developed by AMOCO, this artificial diamond bit has been successfully used in shales, cherts and carbonate sequences. It has been proven to work well in formations of a consistent lithology and type, but not in alternating sequences. During Leg 136, the drilling rate was good (4-5 m/hr penetration), but core recovery was very poor. AMOCO has since discovered a design deficiency in the placement of the PDC cutters, which has now been changed. The PDC core bit will be tried again at Hole 504B.

3.2 Leg 137 (M. Storms)
A positive displacement mud motor can now be connected to the core barrel, and this system was tested on Leg 137. This assembly is wireline non-retrievable, so has to be tripped for every core. This was not a problem at Hole 504B because the bit had to be changed as often anyway, requiring tripping the entire drillstring. During the test, there was a failure in the connection between the downhole motor and the core barrel, resulting in the core barrel being left in the Hole.

3.3 Leg 138 (J. Allan)
The E. Equatorial Pacific Leg was not of great scientific interest to either Panel; however, it heralded the introduction of Macintosh computers with graphics packages. Barrel sheets and stratigraphic summary sheets are now computerized, and thus will increase the efficiency of publication of the reports.

ODP also has openings for two Staff Scientists: a geochemist and one other of unspecified specialty.

3.4 Leg 139--Scientific Results (J. Franklin)

The objective of Leg 139 (Sedimented Ridges I) was to attempt to document the three-dimensional structure of the hydrothermal field in Middle Valley, the sedimented rift valley of the northern, Juan de Fuca Ridge. Site 855 consisted of a transect across the hanging wall block along the normal fault that forms the eastern topographic boundary of the sedimented rift valley. The objectives of this transect were to define the geometry and hydrologic nature of this fault, and to determine the nature and rate of fluid flow along the fault, which may represent a downwelling recharge zone. Volcanic basement was encountered at 90-120 m and was characterized as normal MORBs. Pore water samples indicated seawater in the volcanic basement and, together with the low heat flow, suggested seawater is being drawn down into the basalt--a process that may be occurring over the extent of the valley.

Site 856 was situated over a small hill in the eastern part of Middle Valley. These features are characteristic of this and other sedimented ridges, and have been suggested to form by uplift of the sediment section, with associated hydrothermal massive sulfide mineralization. 96 m of massive sulfides were drilled, with about 20% recovery, and consisted of pyrite and pyrrhotite with small amounts of chalcopyrite and sphalerite. In addition, sills of essentially picritic composition (600-800 ppm Cr) were penetrated within the mound.

Site 857 was located 5.2 km west of the normal fault scarp that forms the eastern boundary of Middle Valley, in an area of a major ($\sim 1W/m^2$) thermal anomaly. Hydrothermally altered sills were drilled beginning at 471 mbsf, with the dominant alteration assemblage being chlorite, epidote and actinolite. A reentry cone with grouted-in casing was set at Hole 857D, which was left to reequilibrate thermally while operations began at Site 858. On returning to Hole 857D, it was deepened to a total depth of 936 mbsf through a sequence of interbedded sills and sediment. Logging was conducted, and a packer/flow meter experiment successfully completed, providing constraints on the hydrologic regime in this Hole. Formation pressures rose little, even at the maximum rate of injection the ship's pumps could supply (3000 L/min); flow rates of nearly 10,000 L/min were estimated, with the majority of this flow going into a permeable zone at 614 mbsf. Finally, an instrumented CORK (Circulation Obviation Retrofit Kit), which included a 300 m long, ten thermistor string, a pressure sensor, and plumbing for fluid sampling was installed in the Hole.

Site 858 was located in an active hydrothermal vent field. Four holes were drilled in an array crossing the field, and three holes were drilled approximately in the center of the vent field. Sections of hydrothermally altered sediment were recovered in all holes, with the degree of alteration varying laterally and with depth in a way consistent with the thermal structure. Basalt was recovered from Holes 858F and

858G, and was highly altered and very permeable. However, the vein mineral assemblages showed little indication of the passage of high temperature fluids. This Hole was also sucking water at a great rate. An instrumented CORK was installed to obviate downhole circulation and to monitor temperature and pressure as the formation returns to equilibrium.

Since the cruise, both CORK systems have been visited by Alvin and are still in place. Data were dumped and the fluid ports were successfully tied into for sampling; however, no fluid samples were obtained and both holes were under pressured. (Operation highlights of Leg 139 and the follow-up cruise are summarized in Appendix I.)

3.5 Leg 142 (M. Storms)

The DCS II system will next be deployed during the engineering leg on the East Pacific Rise. The primary goals include maximizing coring time, achieving a minimum penetration of 100 m in basalt with greater than 50% recovery, deploying the new 3-leg/hex-sided hard rock guidebase, using a new piloted reaming bit to determine the feasibility of reaming the 3.96" DCS hole out to 7-1/4", and evaluating the second stage drill-in bottom hole assembly with 7-1/4" bit. The diamond core barrel may also be tested. Operations will be conducted on a ponded lava lake. (The operating schedule, engineering goals, and basic operations plan are attached as Appendix II.)

4.0 ENGINEERING STATUS REPORT (M. Storms)

The slingshot testing of the DCS II system has been successfully completed. Testing of the complete system, including the secondary heave compensator is scheduled for the next few weeks, once the hardware and software have been delivered.

Other improvements have been made based on the Leg 132 results. A number of new core catchers, including a finger-type that can be used in conjunction with the collet-type will be available on Leg 142. In addition, the mini hard rock guide base has been redesigned with 3 legs, hexagonal sides, and a new ballast system composed mostly of steel pipes. This should allow its deployment on slopes up to 25°.

Another problem that has been addressed is the difficulty of drilling through unstable zones. The drill-in casing system has been redesigned to make a nested system that will allow deployment of a second stage drill-in bottom hole assembly in order to isolate a rubble zone.

Feasibility studies for the DCS Phase III system have now been completed on two concepts: a bottom-mounted slip joint concept and an integral riser-tension concept, both of which are complex and costly. TEDCOM has suggested that the need for the guide horn beneath the ship should be reevaluated since this adds complexity to the DCS Phase III concept. Given its current status, it is highly unlikely that DCS Phase III will be ready for use on Leg 147 as tentatively scheduled. (Schematics of DCS Phase II system and the status of DCS Phase III are attached as Appendix III.)

5.0 DOWNHOLE LOGGING AND SAMPLING

5.1 Fluid Sampling (D. Moos)

A general review of the availability of tools to sample fluids and measure hydrologic properties downhole suggests there is currently no satisfactory method to sample formation fluids or measure *in situ* permeability, pore pressures, etc. Given the failure of the wireline packer and the uncertainty of the further development of Geoprops, this has become a critical issue. In addition, SGPP had attached the highest priority to fluid sampling and property measurement for expenditure of the OPCOM funds.

A number of suggestions have been made concerning possible directions for tool development to address the problem:

1) use the wireline fluid sampler without packers
2) use the wireline fluid sampler with drillstem packers to isolate a borehole interval
3) design a self-boring sampler
4) use a drillstem straddle packer with gas lift
5) use an industry formation tester with side-entry sub.

Other ideas include installing casing, which can then be perforated for sampling, or use a wireline packer below the pipe.

LITHP and TECP are concerned that adequate capability for formation fluid sampling and *in situ* hydrologic property measurements be available on critical legs, such as Cascadia (Leg 146). They make the following recommendation:

LITHP and TECP jointly believe that the current inability to sample formation fluids and measure pore pressure, permeability and temperature, including in slim holes, is jeopardizing the success of the program, especially such legs as Cascadia and EPR II. We strongly urge that a group be formed immediately to investigate and resolve this problem using OPCOM money for tool development.

Beyond this immediate crisis, LITHP and TECP strongly feel that an integrated strategy is required to develop the routine ability to make such measurements in the various geologic environments of concern to each of the thematic panels.

5.2 Downhole Logging Measurements - A Primer (J. McClain and D. Moos)

(This session was designed to educate both TECP and LITHP about the capabilities and current status of downhole logging measurements. Details of the ODP logging program and tools are presented in a manual available from the LDGO Borehole Research Group.)

Logging is important for a number of reasons:

1) Core recovery is incomplete, while logs can be continuous

2) Physical properties measurements on cores are inaccurate, whereas logging measures properties *in situ*

3) A core is a one-dimensional sample, whereas logs can "see" away from the hole

4) The scale of log measurements is more compatible with that of surface geophysical measurements (i.e. the scale over which logs make measurements is larger than that for measurements made on core samples).

Wireline logging measurements are made at specific locations along the 70' length of the tool. In addition, some logging measurements cannot be done at the bottom of the Hole because of the deployment of a combination of logging tools. This, together with the fact that it is often necessary to drill past the point of interest, should be taken into consideration by panels when evaluating proposals to drill and sample basement. Most measurements must be made in an open hole, but ODP holes often are open only when the pipe is in the hole. A side-entry sub (see attached schematic) allows both the wireline and drillpipe to be present simultaneously, so the pipe can clear the hole. This technique improves information recovery significantly.

Logging tools are typically run in combination as strings--examples are listed in Appendix IV. Standard logging tools include gamma-ray (determines concentrations of U, Th and K), sonic (measures compressional wave velocity along the wall), neutron porosity, lithodensity (determines density and measures long dimension of the hole), and resistivity. Other tools permit measurements of seismic properties away from the hole (e.g. well seismic tool), and analyses of other elements (e.g. aluminum activation tool). The borehole televiewer, which is an analog tool, is available and is used to get a picture of the borehole. A digital version from Germany is now on board and is producing excellent data. The dual lateral logs of electrical resistivity operate by driving current into the formation, and are used for formations such as basalts and diabases. Recording of measurement configuration can give horizontal and vertical anisotiropy.

A number of other techniques are available outside of ODP. The enhanced resolution tool (ERT) for geochemical measurements has enhanced spectral resolution (see Appendix IV) but requires increased time due to lower counting efficiency. Sulfide and other related compounds are measured in the mining industry using an induced polarization tool. Other tools include complex resistivity, magnetic susceptibility, a 3-axis magnetometer, borehole radar, and *in situ* gravity, which can be measured in hole and inverted as a function of depth to give precise measurements of density.

A major lack in downhole measurements is the determination of bulk density. This would require substantial modification of existing tools.

6.0 TECP-LITHP COMMON OBJECTIVES (E. Moores)

The major themes of joint TECP-LITHP interest can be summarized as follows:

a) Mid-ocean ridge (spreading center) processes
- Combined lithologic, tectonic and hydrothermal processes
- Differences between structure at fast and slow spreading ridges bear on the relationship between tectonic and magmatic activity
- Sulfide deposits clearly are linked to structurally-produced plumbing conduits.

b) Tectonics of rifted continental margins
- Evolution of both volcanic and non-volcanic margins
- Exposure of peridotites (e.g. Galicia Bank) of petrologic and tectonic interest. Textures in mantle rocks record the processes of tectonic flow in the mantle.

c) Fracture zones
- Volcanism within F.Z. is a lithosphere objective, but distribution is a tectonic question
- Exposure of deeper layers result from tectonism
- Relation of these to "normal" oceanic crust of lithospheric interest.

d) Intraplate volcanism
- Tectonic questions concern their relationship to superswells--major mantle convective systems, and their use in defining plate kinematics
- Lithospheric questions relate to magma source and evolution

e) Convergent margins
- Magmatism and hydrothermal processes and their distribution are most likely controlled by tectonic activity
- Tectonic objectives also involve tectonics of accretionary prisms, especially interplay of fluid in tectonic activity.

There is clearly a need to encourage proposals to address these joint objectives, since most proposals received have a tendency to concentrate on either lithospheric or tectonic goals. This often results in proposals being highly ranked by one panel and poorly ranked by the other when, in fact, more attention to both panels' interests would result in a much stronger proposal with high endorsements from both panels.

TECP and LITHP will consider putting out a joint RFP in U.S. and non U.S. publications for proposals that address coupled tectonic-volcanic systems. An example might be using an offset drilling strategy to answer questions related to the interaction of magmatic, volcanic and tectonic processes at mid-ocean ridges. Another possibility would be ODP-sponsored symposia at AGU, GSA, EGU meetings specifically on drilling and volcanic-tectonic systems.

Careful attention should also be paid to the common objectives when staffing of both panels is under consideration. At present, both LITHP and TECP feel that their interests are well represented on both Panels, and the liaisons (J. Karson from TECP to LITHP, and S. Cloetingh from LITHP to TECP) are appropriate.

7.0 PROPOSAL SUBMISSION DEADLINES

Several people did not receive the prospectus or, in the case of TECP, the second mailing of proposals because of mail delays or because they were already travelling by the time that materials were sent out. The short lead time between panel chairs' receipt of proposals and the date of the meeting also necessitated the use of expensive courier and overnight mail services, thereby more than exhausting panel chairs' budget.

TECP and LITHP jointly urge the JOIDES office to set a submission deadline sufficiently in advance of the panel meetings (six weeks?) so as to ensure that all panel members receive copies of appropriate prospectuses and/or proposals in time to read them, and so that panel chairs do not have to routinely resort to expensive express mail and courier services.

8.0 JOINT MEETING AND FIELD TRIPS

All members of LITHP and TECP agreed that joint meetings that include a pre-meeting field trip, as this one did, are extremely valuable in enhancing coordination between the panels, improving communication, etc. The panels agreed to try to schedule a joint meeting every year or one and one half years. These joint meetings should be preceded by carefully selected field trips that ideally visit on-land examples of topics of high common interest. John Mutter commented that PCOM generally is in favor of common meetings, especially if it results in a common voice on issues of common concern, such as offset drilling.

OPERATIONAL HIGHLIGHTS
LEG 139

- This leg was an ambitious program of investigating hydrogeologic circulation and its effects on the sediments and underlying rocks in the environment of a sedimented seafloor-spreading ridge.
- A total of 22 holes were examined at four sites.
- Drilling/logging/coring operations were carried out in the highest downhole temperatures for ODP/DSDP(est 300 to 350C)
- Nearly 160 meters of massive sulfide deposits were cored in two holes.
- The first operational deployment (twice) of the CORK with installed instrumentation.
- The first operational deployment of the Pressure Core Sampler.

000521

LITHTECP MTG
NICOSIA, CYPRUS
OCT 9-11, 1991

POST LEG 139 ATLANTIS CRUISE

* DR. EARL DAVIS AND DR. KEIR BECKER (WITH ODP ENGINEER TOM PETTIGREW)
* RETURNED TO LEG 139 SITES 857 AND 858 TO INSPECT "CORK" EMPLACEMENTS
* ALL CORK HARDWARE IN PLACE AS DESIRED
* SUCCESSFULLY INTERROGATED DATA LOGGERS AT BOTH SITES
    * THERMISTOR STRINGS
    * BORE HOLE PRESSURE DATA
* SUCCESSFULLY DUMPED DATA AND REPROGRAMMED SAMPLE RATE FROM EVERY TEN MINUTES TO ONCE PER HOUR
* SUCCESSFULLY ATTACHED TO BOTH FLUID SAMPLER PORTS
* NO FLUID SAMPLES OBTAINED - BOTH HOLES UNDER PRESSURED (858G - 50 PSI, 857B - 80 PSI)
* HOLE 858B APPEARS TO HAVE TURNED INTO A BLACK SMOKER
* HOLE 858F (EXPLORATORY HOLE) APPEARS TO BE TAKING SEA WATER EVEN THOUGH ATTEMPTS WERE MADE TO PLUG IT WITH CEMENT
* AN ATTEMPT TO COVER HOLE WITH 4 X 4 PLATE WAS UNSUCCESSFUL - PLATE APPARENTLY FELL IN HOLE SIDEWAYS

APPENDIX II

LITHTECP MTG
NICOSIA, CYPRUS
OCTOBER 9-11, 1991

LEG 142 EAST PACIFIC RISE - OPERATING SCHEDULE

IN PORT VALPARAISO, CHILE	JANUARY 13-17, 1992
DEPART VALPARAISO, CHILE	JANUARY 18, 1992
TRANSIT TO EPR-2	12.5 DAYS (@ 10.5 KTS)
OPERATIONS ON SITE EPR-1	35.9 DAYS
9° 30.8' NORTH LATITUDE 104° 14.6' WEST LONGITUDE	
TRANSIT TO HONOLULU, HAWAII	12.6 DAYS (@10.5 KTS)
ARRIVE HONOLULU, HAWAII	MARCH 19, 1992

TOTAL DAYS IN PORT	5.0
TOTAL TRANSIT DAYS	25.1
TOTAL DAYS ON-SITE	35.9
TOTAL DAYS ON LEG	66.0

000523

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OCTOBER 9-11, 1991

LEG 142 EAST PACIFIC RISE - PRIMARY ENGINEERING GOALS

* MAXIMIZE CORING TIME WITH THE DIAMOND CORING SYSTEM
* ACHIEVE MINIMUM PENETRATION OF 100 MBSF
* ACHIEVE GREATER THAN 50% RECOVERY OF FRACTURED ROCK
* DEPLOY NEW 3-LEG/HEX SIDED HARD ROCK GUIDE BASE
* DEPLOY A NEW PILOTED REAMING BIT TO EVALUATE THE FEASIBILITY OF REAMING A 3.96" DCS HOLE OUT TO 7-1/4"
* EVALUATE 2ND STAGE DI-BHA SYSTEM WITH 7-1/4" DIA BIT

000524

LITHTECP MTG
NICOSIA, CYPRUS
OCTOBER 9-11, 1991

LEG 142 EAST PACIFIC RISE - SECONDARY ENGINEERING GOALS

* EVALUATE SLIM HOLE LOGGING CAPABILITY AND PLATFORM DEPLOYMENT TECHNIQUES (TEMPERATURE/CALIPER)

* IF POSSIBLE CONDUCT STANDARD LOGGING IN REAMED HOLE TO VALIDATE/COMPARE WITH SLIM HOLE RESULTS

* EVALUATE EFFECTIVENESS OF DIAMOND CORE BARREL (DCB) 7-1/4" CORING SYSTEM IN FRACTURED ROCK

    * DIAMOND BIT LIFE AND PENETRATION RATE
    * HOLE STABILITY
    * 6-3/4" DRILL COLLAR PERFORMANCE

NOTE:

A 2ND HRB MAY BE DEPLOYED
BUT UNDER THE FOLLOWING CONDITIONS:

(1) INITIAL HRB/HOLE IS LOST AND UNRECOVERABLE

(2) TEMPERATURE GRADIENT PREVENTS CONTINUED CORING IN INITIAL HOLE

(3) DCS CORING IS AHEAD OF SCHEDULE AND CANNOT CONTINUE DUE TO OTHER CONSTRAINTS SUCH AS DRILL ROD SHORTAGE, OR MECHANICAL MALFUNCTION.

(4) REQUIRED TO EVALUATE DIAMOND CORE BARREL (DCB)

LITHTECP MTG
NICOSIA, CYPRUS
OCTOBER 9-11, 1991

LEG 142 EAST PACIFIC RISE - BASIC OPERATIONS PLAN

* DEPLOY MINI HARD ROCK GUIDE BASE ON PONDED LAVA LAKE
* DRILL-IN 1ST STAGE OF DI-BHA 4-5 METERS INTO SEA FLOOR
* CONDUCT SLIM HOLE DIAMOND CORING OPERATIONS TO 100+ MBSF (ASSUMING ACCEPTABLE TEMPERATURE GRADIENT)
    * DETERMINE ACTUAL DEPTH OF LOW VELOCITY "RUBBLE" ZONE ESTIMATED AT 40-60 MBSF

    [HOLE SIZE 3.96", CORE SIZE 2.20" X 10']
* ATTEMPT SLIMHOLE TEMP/GAMMA/CALIPER LOGGING
* ATTEMPT REAMING 3.96" HOLE OUT TO 7.25"
* IF STABLE HOLE THEN CONDUCT STD LOGGING OPS
    * SUITE 1 - RESISTIVITY/DENSITY/CALIPER
    * SUITE 2 - VELOCITY/GAMMA
    * SUITE 3 - EITHER FMS OR BHTV
* DEPLOY 2ND STAGE DI-BHA TO ISOLATE "RUBBLE" ZONE.
* IF TIME/TEMPERATURE GRADIENT PERMITS THEN:
    * RESUME DCS CORING OPERATIONS

    <u>OR</u> * DEPLOY 2ND HRB AND EVALUATE DIA CORE BARREL

    [HOLE SIZE 7.25", CORE SIZE 2.31" X 30.0']

APPENDIX III

LITHTECP MTG
NICOSIA, CYPRUS
OCT 9-11, 1991

PHASE IIB - DIAMOND CORING SYSTEM STATUS

* SLINGSHOT TESTING SUCCESSFULLY COMPLETED
* HYDRAULIC SYSTEMS NEARLY COMPLETE
* ELECTRICAL SYSTEMS IN PROGRESS WEEK OF SEPT 30TH
* SECONDARY HEAVE COMPENSATOR HARDWARE/SOFTWARE MODS IN PROGRESS
* SECONDARY HC INSTALLATION AND TESTING SCHEDULED FOR WEEK OF OCTOBER 7TH
* DRILLING, SECONDARY HC, AND OTHER SYSTEM TESTING SCHEDULED TO CONTINUE THROUGH MONTH OF OCTOBER
* RIG DOWN AND PREPARATION FOR SHIPPING TO VALPARAISO SCHEDULED FOR EARLY NOVEMBER

000527

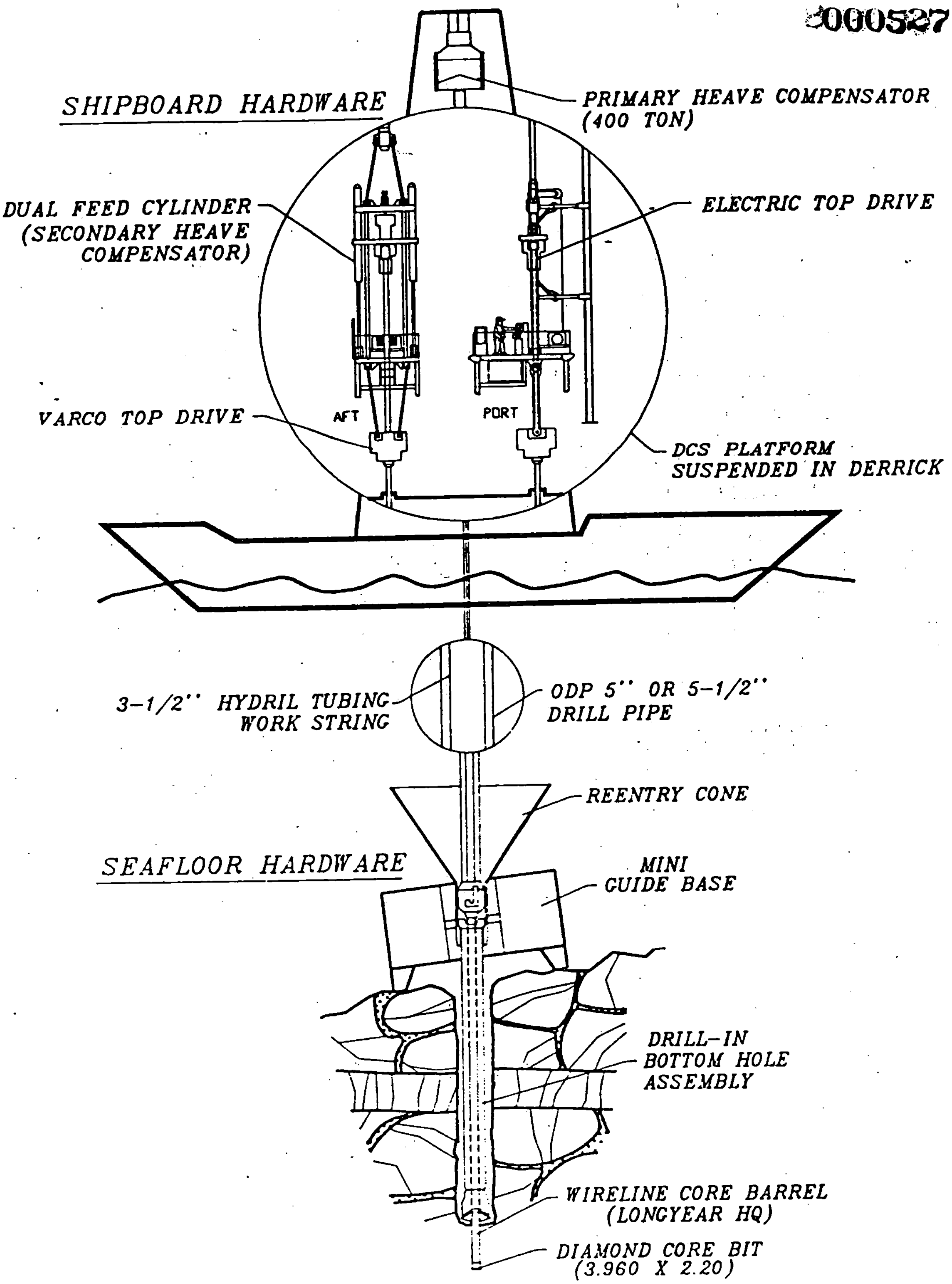


Figure A1

DIAMOND CORING SYSTEM
PHASE II - 4500 METER

S000528

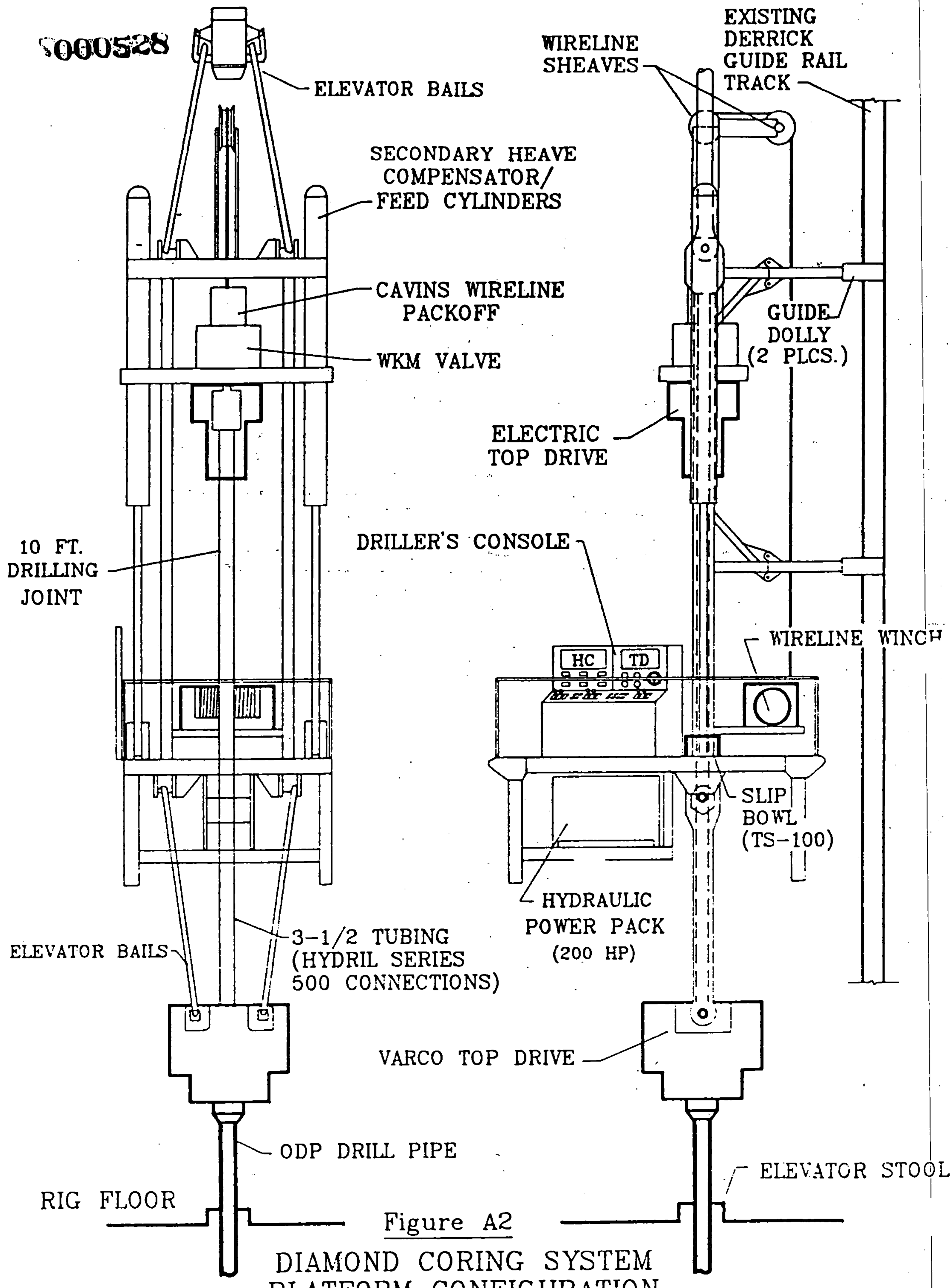
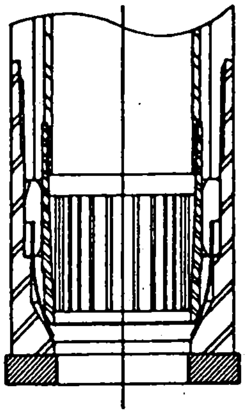
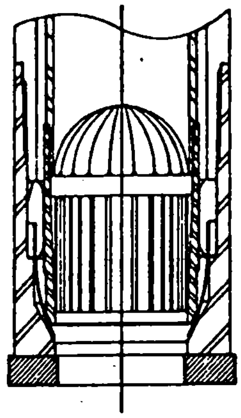


Figure A2

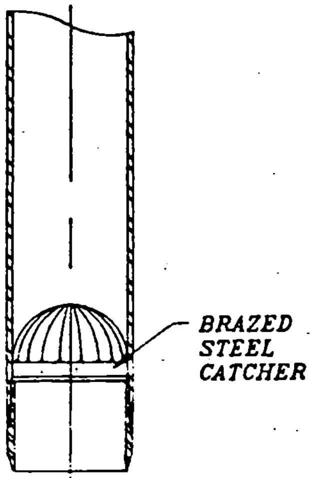
DIAMOND CORING SYSTEM
PLATFORM CONFIGURATION
PHASE II - 4500 METER DEPTH CAPACITY



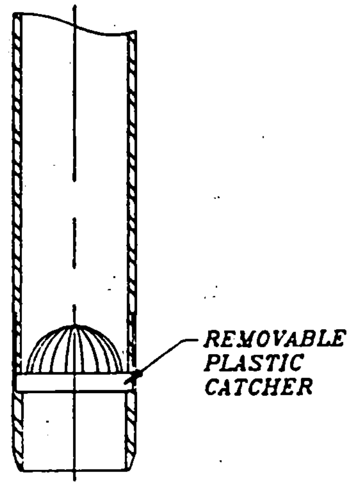
CORE BARREL
COLLET TYPE CATCHER



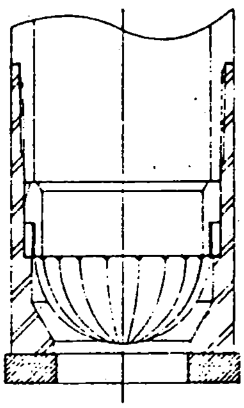
CORE BARREL
COLLET TYPE W/BASKET CATCHER



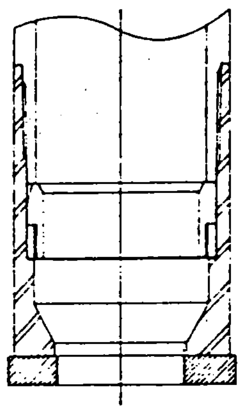
SHELBY TUBE
BASKET CATCHER



SPLIT SPOON
BASKET CATCHER



CORE BARREL
FLOAT VALVE



CORE BARREL
W/O FLOAT VALVE

Figure B2

DCS PHASE IIB
CORE CATCHER/FLOAT VALVE
ASSEMBLY OPTIONS
(LEG 142/EPR)

000530

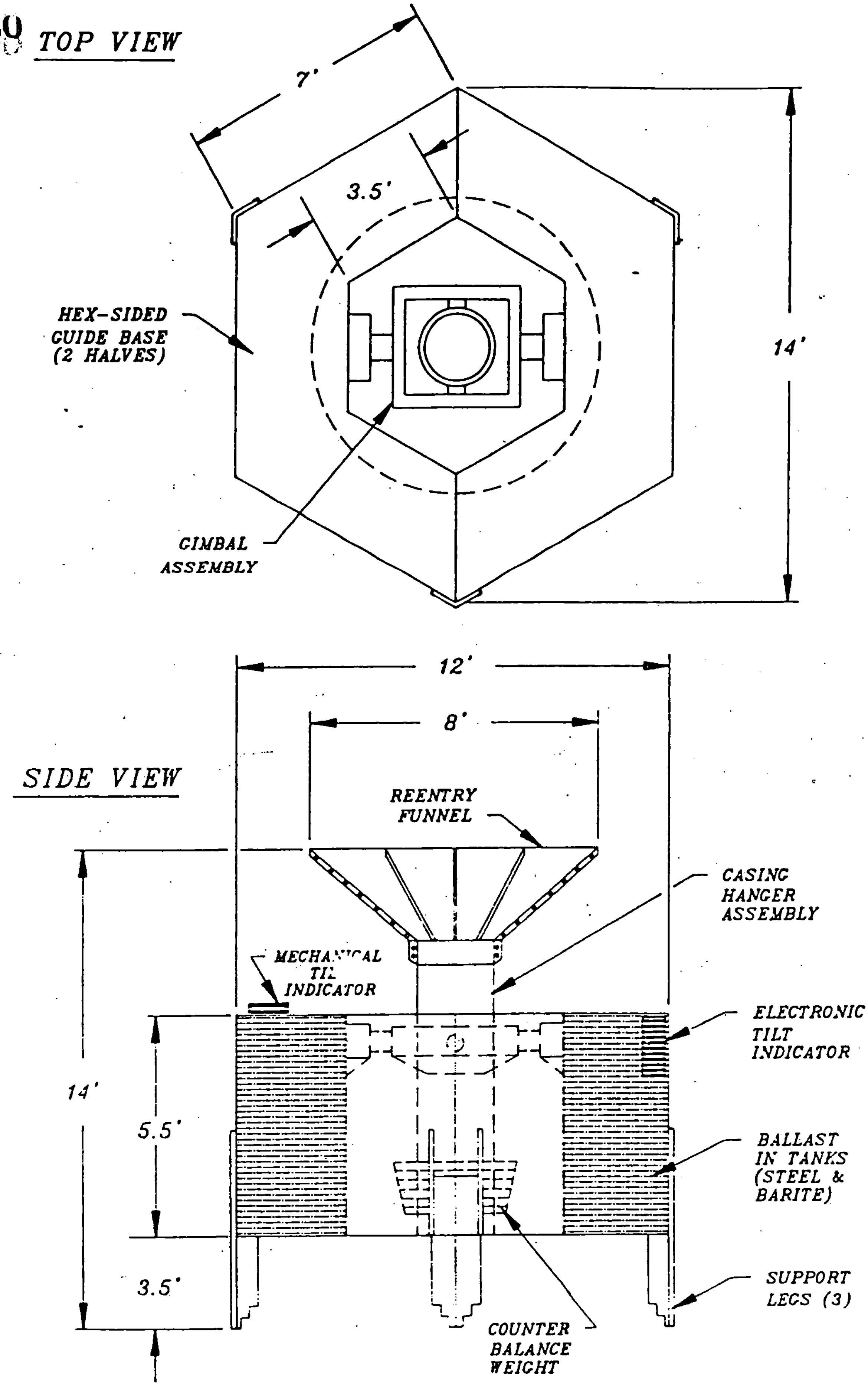
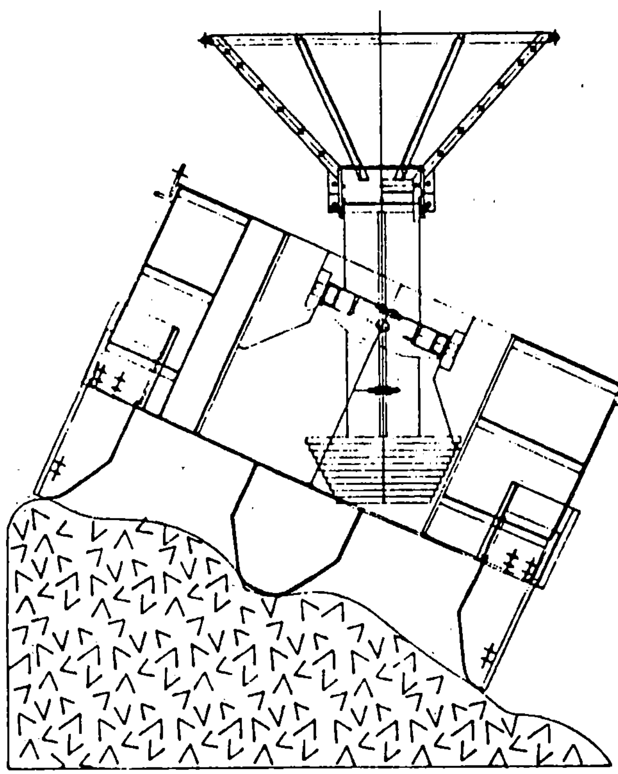


Figure C1

MINI HARD ROCK GUIDE BASE (HRB)
HEXAGONAL DESIGN SCHEMATIC

MINI HRB SPECIFICATIONS



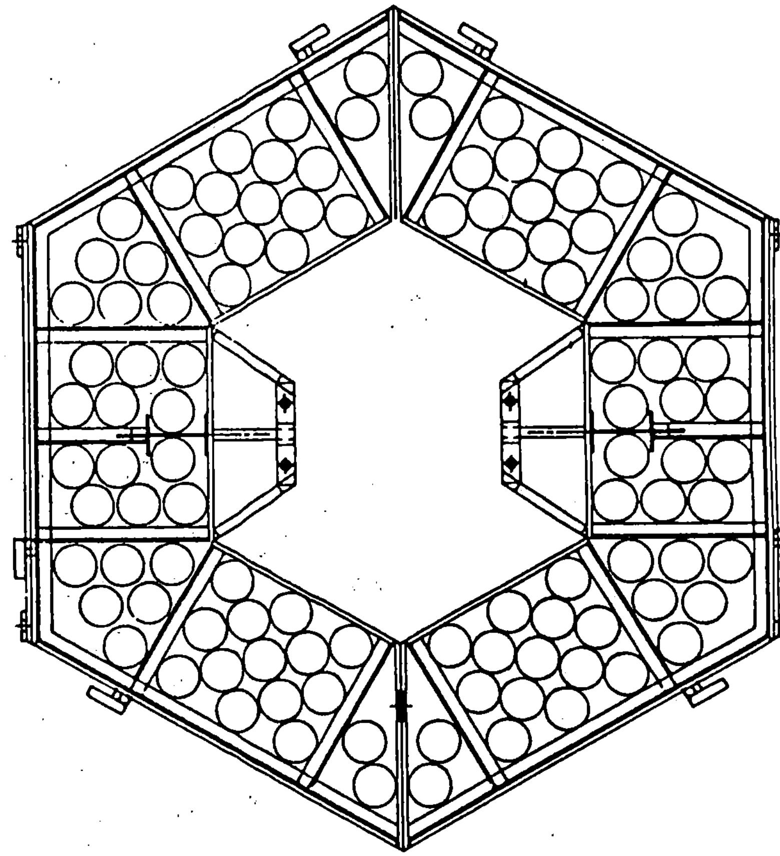
DESIGN REQUIREMENTS

BASE BOLTS – 1 IN. A 372 (18 TOTAL)
LEG BOLTS – 7/8 IN. A 372 (8 PER LEG)
S.F. FOR UPRIGHTING MOMENT – 2.5
S.F. OF BASE BOLTS AGAINST SHEAR – 19:1
MAX TILT (INTO SIDE) – 25° (INTO CORNER) – 30°

DRY BASE COMPONENT WEIGHTS

BASE SECTIONS(2) –	26,500 LBS.	CONE –	1,600 LBS.
GIMBAL –	1,075 LBS.	COUNTERWEIGHT –	6,350 LBS.
CASING HANGER –	4,250 LBS.	LANDING SEAT –	375 LBS.
LEGS (3) –	2,250 LBS.	TOTAL	41,400 LBS.

MINI HRB BALLAST FOR LEG 142



BALLAST

STEEL PIPE: 8.62" (21.9 cm) X 8.22" (20.9cm) X 5.58' (1.7 m)

TOTAL WEIGHT PER PIPE 770–792 LBS. (350–360 KG.)

MAXIMUM ALLOWABLE PIPES PER BASE: 108 PIPES

TANK VOLUME: 493 FT.^{3}

DRY WEIGHT

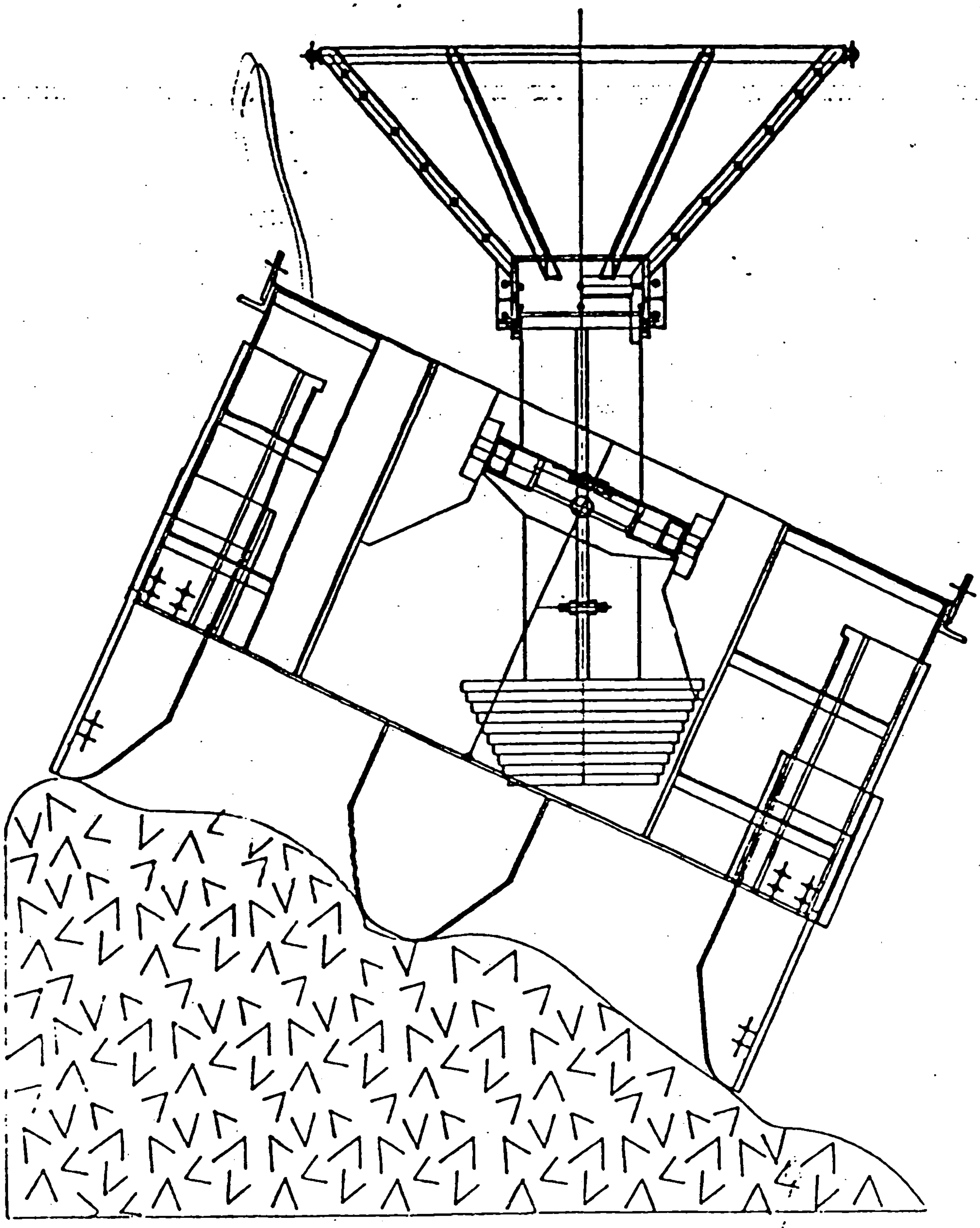
STEEL PIPES –	83,160 LBS.
CEMENT –	29,500
BASE –	41,400
TOTAL –	154,060 LBS.

SUBMERGED WEIGHT

STEEL PIPES –	72,350 LBS.
CEMENT –	13,500
BASE –	36,020
TOTAL –	121,870 LBS.

Figure C2

1000532



MINI HEX–BASE POSITIONED AT 25° MAXIMUM TILT

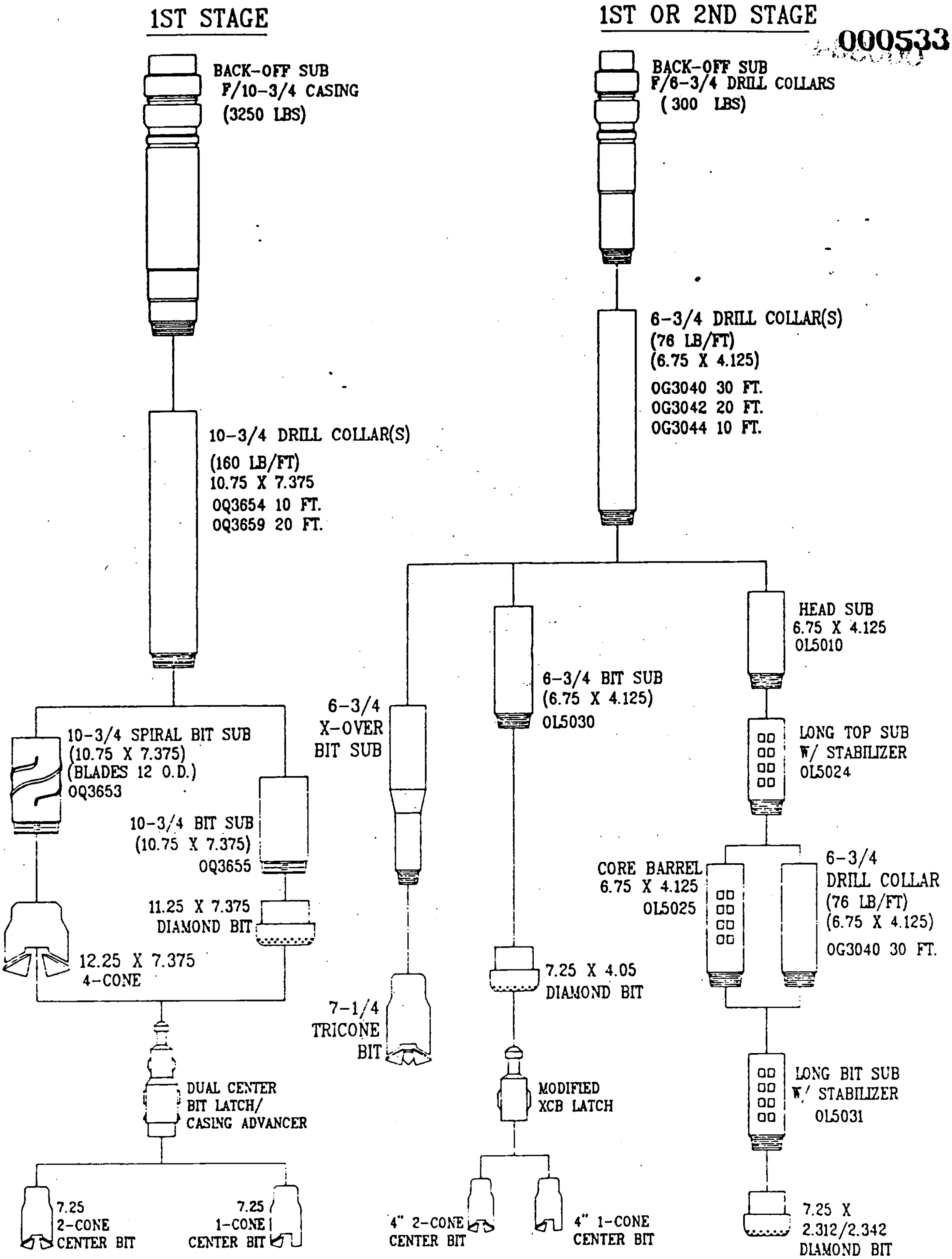


Figure D6

NESTED DRILL-IN CASING SYSTEM

000534

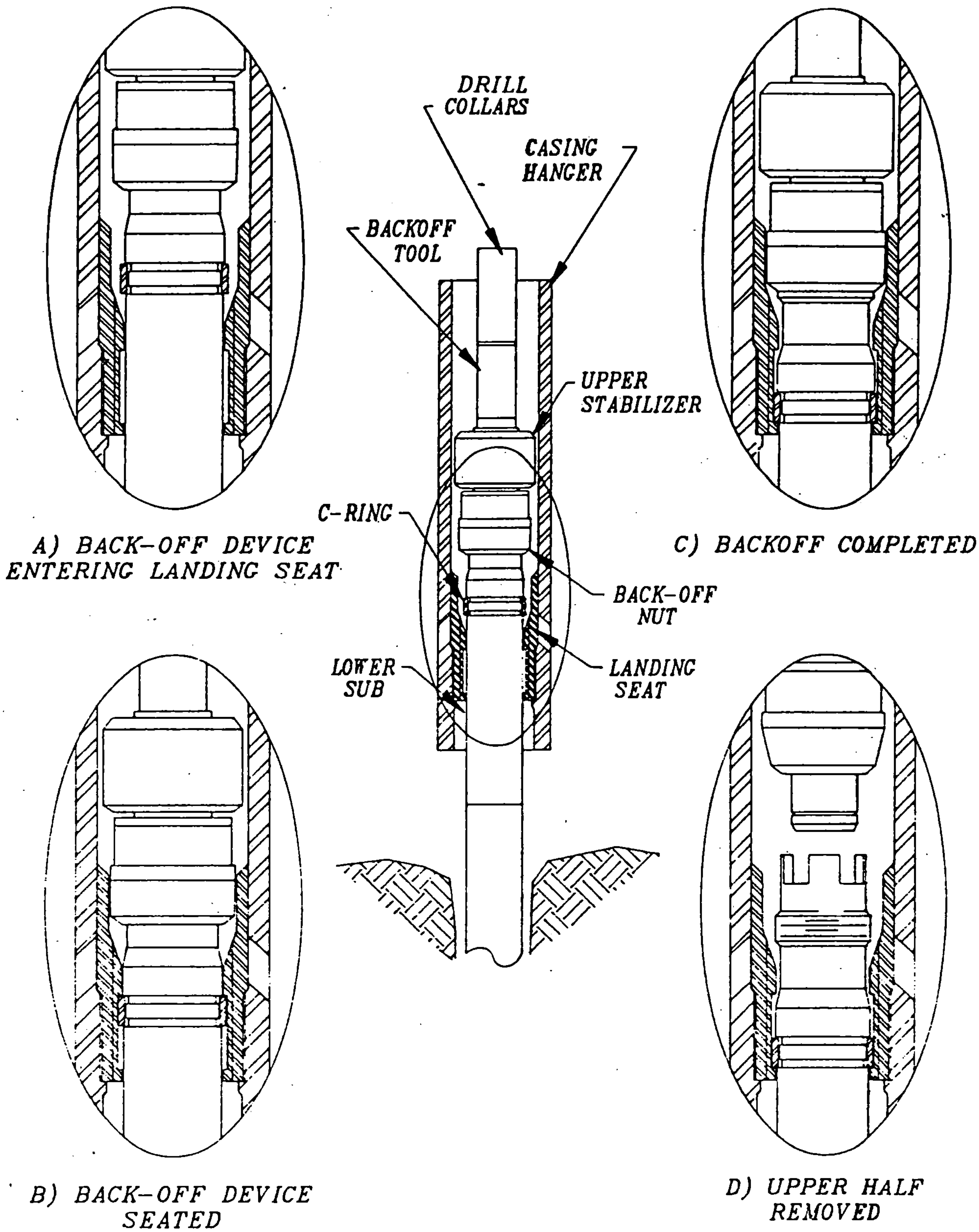


Figure D1

DEPLOYMENT SCHEME FOR MECHANICAL BACK-OFF DEVICE
(SEAFLOOR TEMPLATE NOT SHOWN FOR CLARITY)

000535

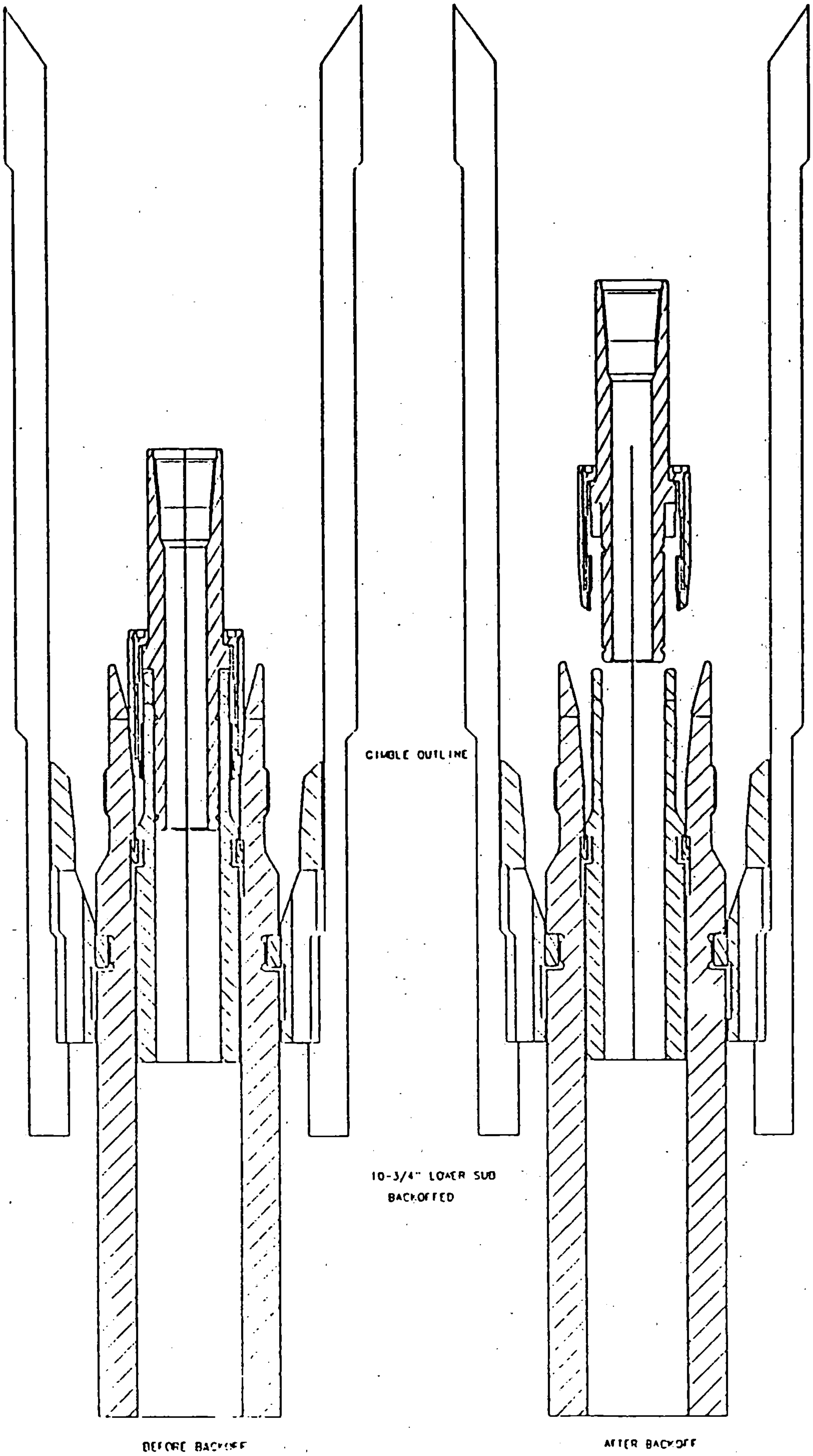
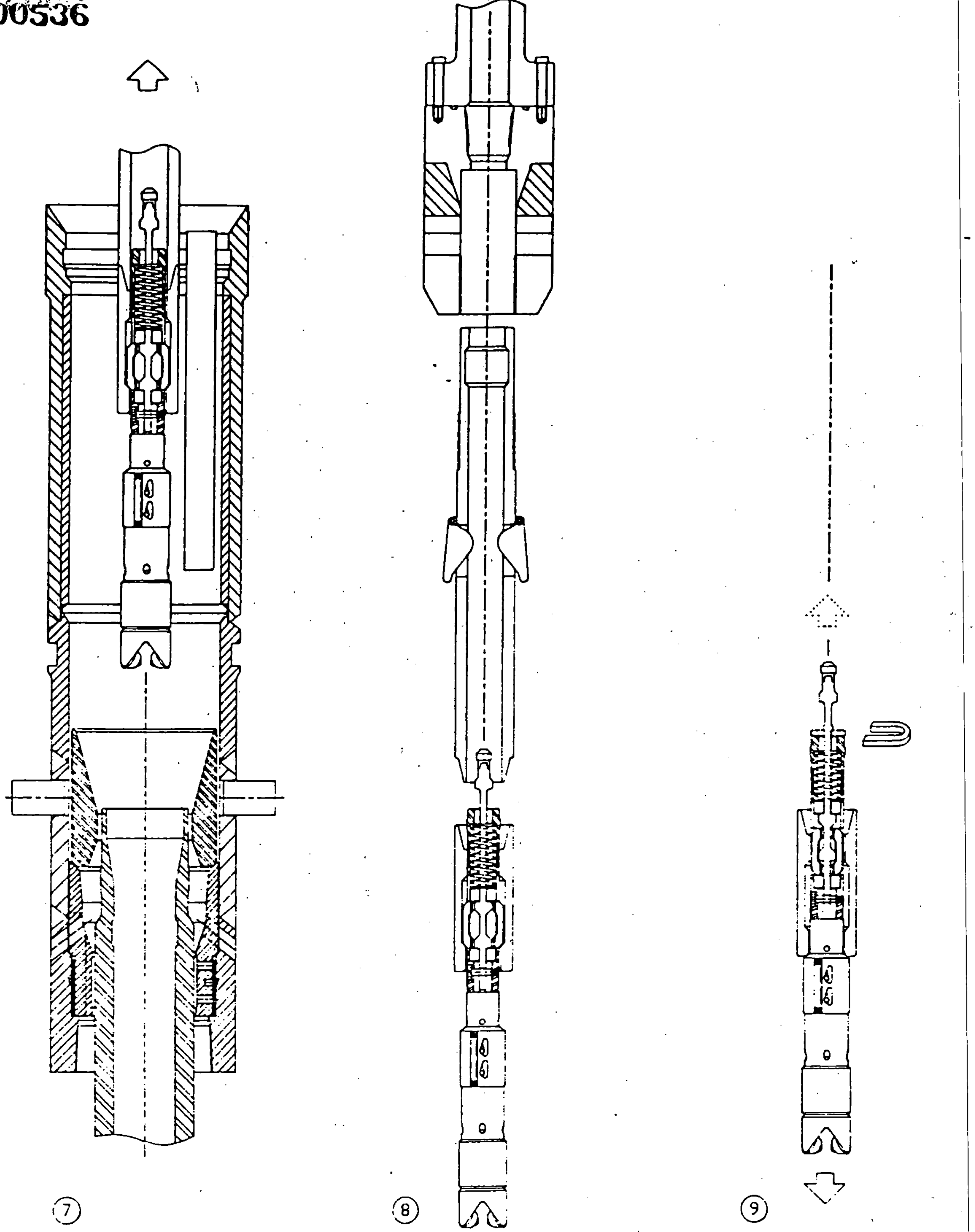


Figure D4

INTERMEDIATE BACK-OFF SUB



(7) UN-J AND RETRIEVE TENSIONING TOOL

(8) REMOVE LOWER SUBS FROM TENSIONING TOOL

(9) RETRACT XCB LATCH W/C-RING CLAMP BEFORE PUSHING CENTER BIT ASSEMBLY THROUGH LOWER SUB

Figure E6

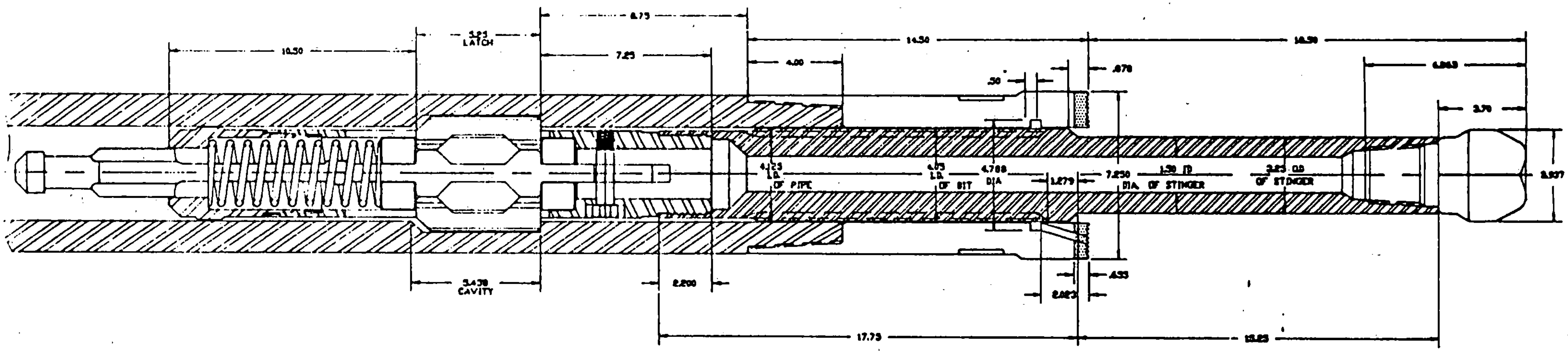


Figure F3

REAMING BIT SPACE OUT

W/ STINGER & LATCH ATTACHMENTS

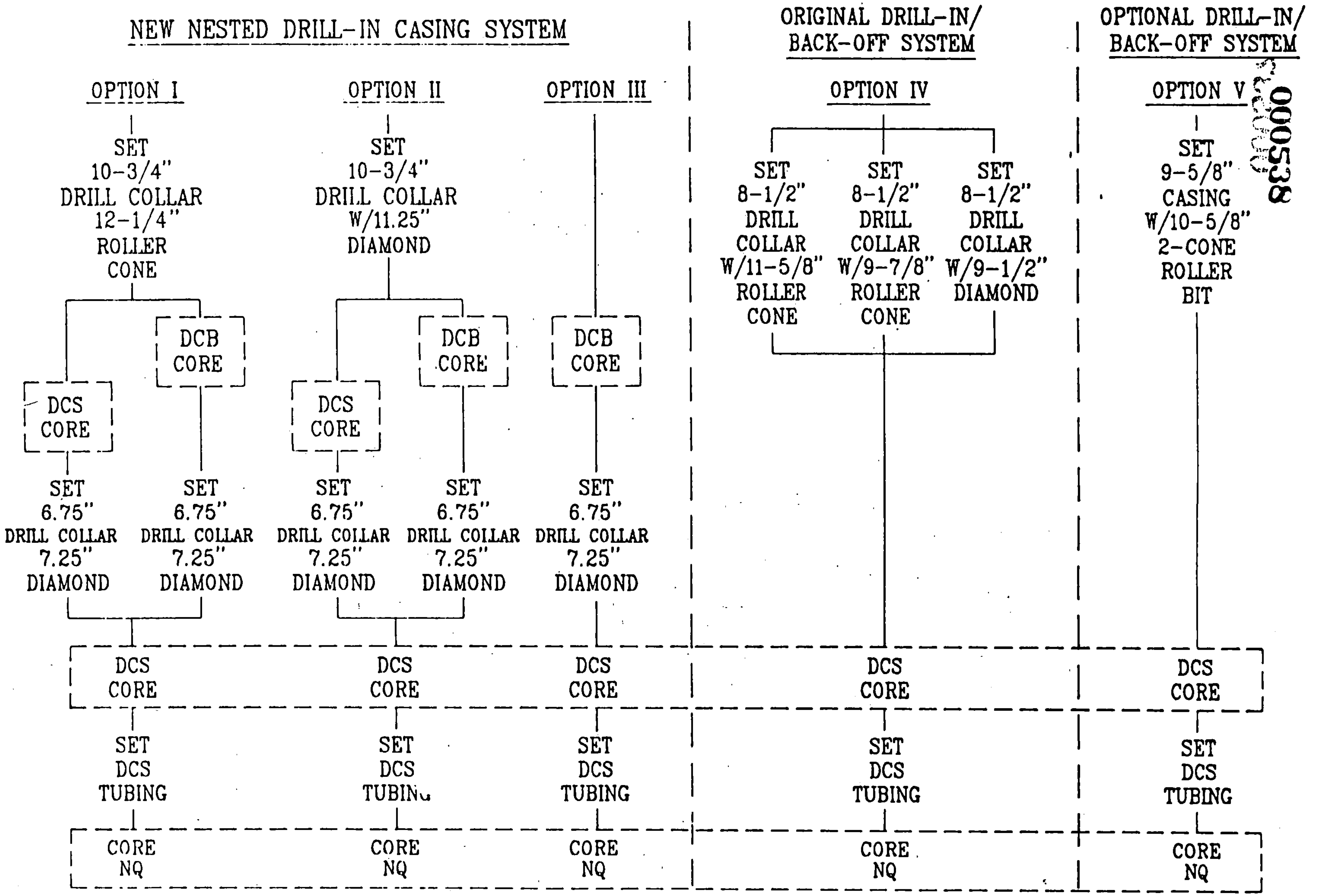


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Figure D2

SEAFLOOR SPUDDING OPTIONS

FOR HARD : LOCATIONS

NOTE: NQ CORE NOT AVAILABLE FOR LEG 142

LITHTECP MTG
NICOSIA, CYPRUS
OCT 9-11, 1991

DCS PHASE III STATUS

* FEASIBILITY STUDIES COMPLETED ON 2 CONCEPTS
    * BOTTOM MOUNTED SLIP JOINT CONCEPT
    * INTEGRAL RISER TENSIONER CONCEPT
* PRELIMINARY INFORMATION HAS BEEN PRESENTED TO TEDCOM
* BOTH CONCEPTS COMPLEX AND COSTLY
* TEDCOM SUGGESTED NEW EVALUATION OF THE NEED FOR THE GUIDE HORN SINCE THIS ADDS COMPLEXITY AND EXPENSE TO THE DCS PHASE III TENSIONER CONCEPT
* DCS PHASE III SYSTEM WILL NOT BE AVAILABLE FOR USE ON LEG 147 (EPR 2) AS TENTATIVELY SCHEDULED

000540

APPENDIX IV

Examples of Standard Logging Tool Strings

Quad Combo
- Natural Gamma Spectral
- Long Spacing Digital Sonic
- Neutron Porosity
- Lithodensity Caliper
- Phasor Induction - Resistivity

Seismic/Stratigraphic
- Digital Sonic
- Lithodensity Caliper
- Natural Gamma Spectral
- Phasor Induction

Litho/Porosity
- Natural Gamma Spectral
- Neutron Porosity
- Lithodensity Caliper

Geochemistry
- Natural Gamma Spectral
- Neutron Porosity
- Aluminum Activation
- Induced Gamma Spectral

Formation Microscanner
- Natural Gamma Spectral
- General Purpose Inclinometer
- Formation Microscanner Dipmeter

SIDE ENTRY SUB

000541

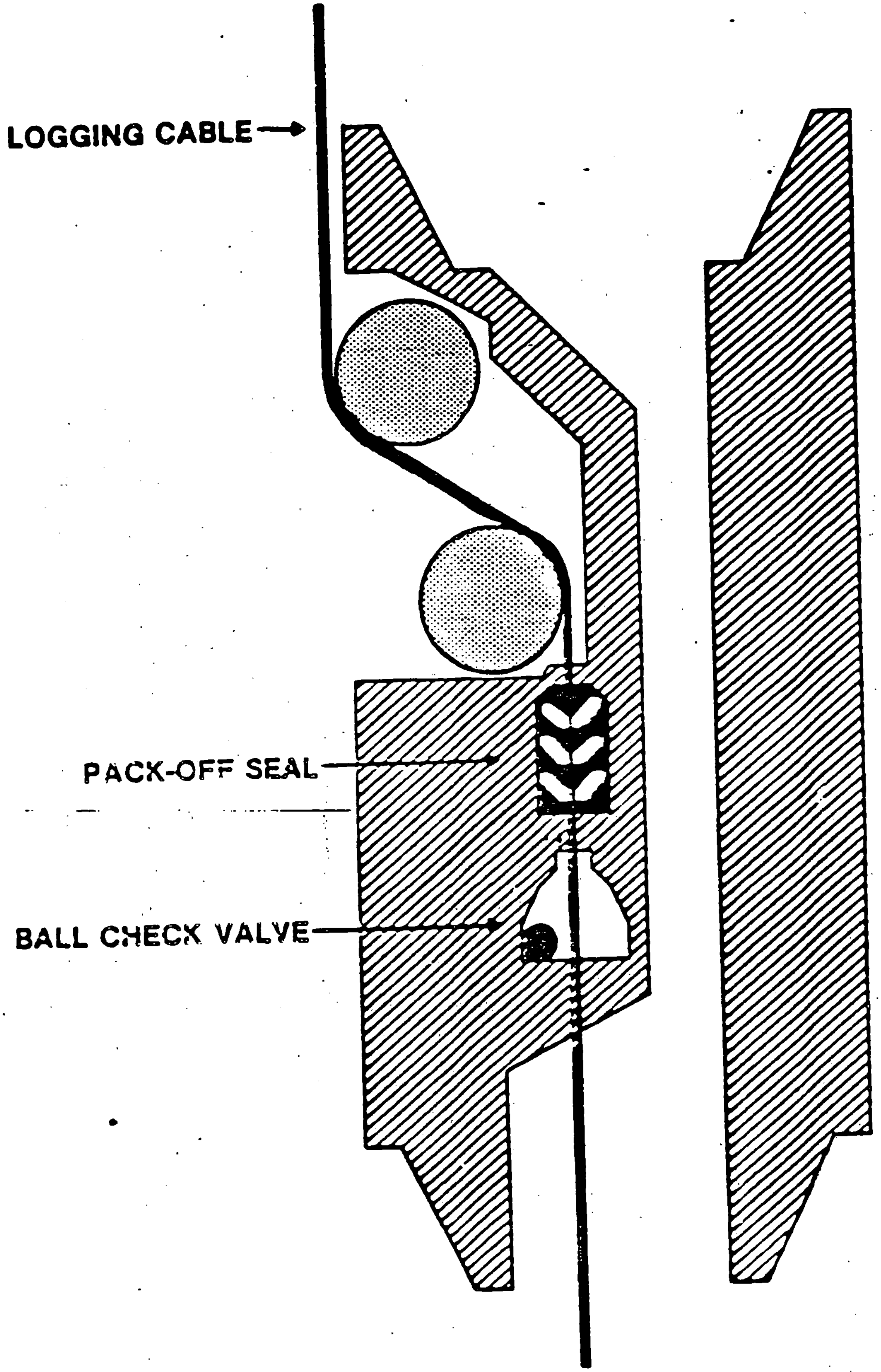
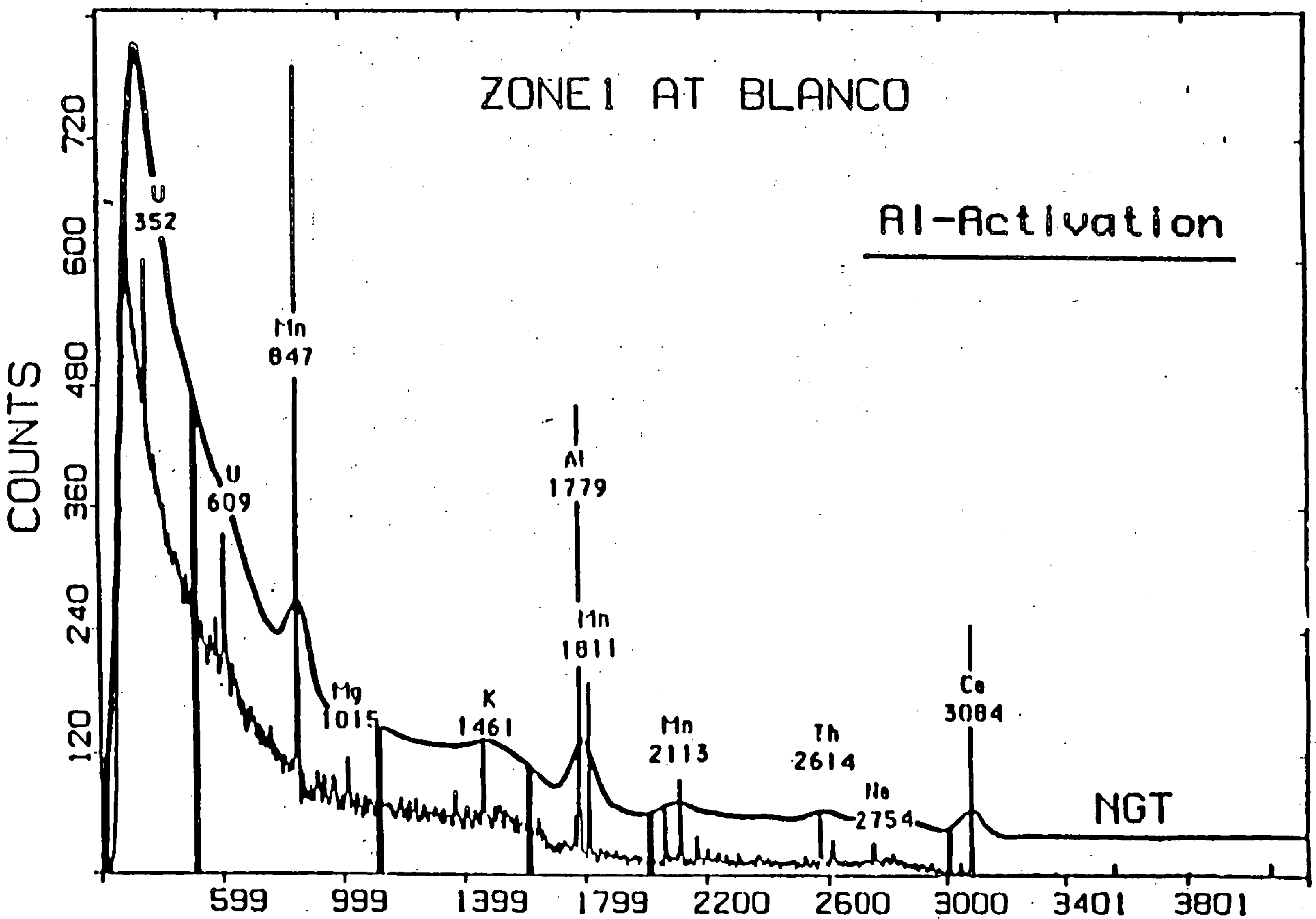


Figure 3

COMPARISON OF NGT AND ERT ACTIVATION SPECTRA



0005 42

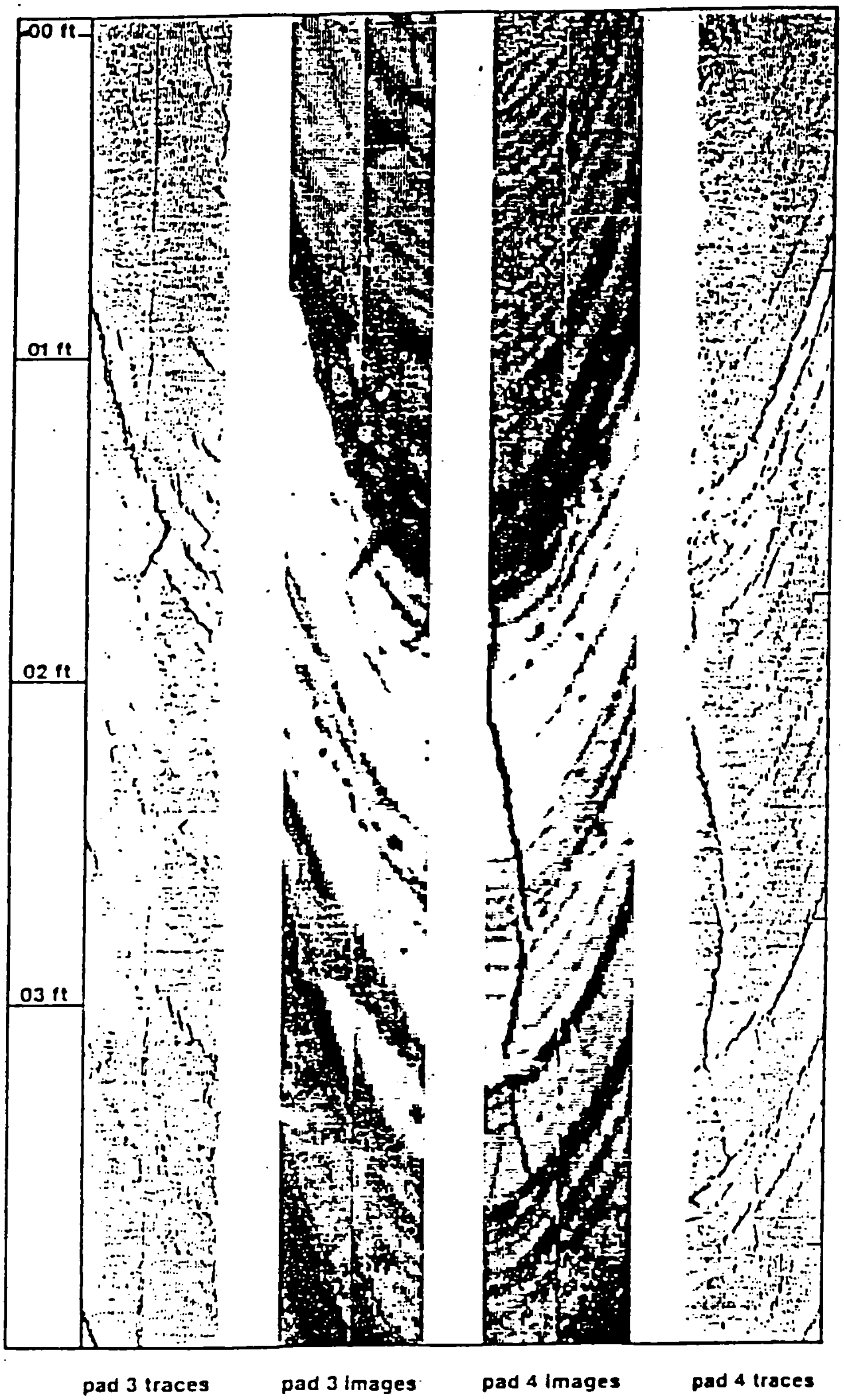


Figure 11. Fractures, High Dips and Vuggy Porosity in the Monterey Formation.

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- Lithodensity Caliper
- Natural Gamma Spectral
- Phasor Induction

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- Neutron Porosity
- Lithodensity Caliper

Geochemistry
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- Neutron Porosity
- Aluminum Activation
- Induced Gamma Spectral

Formation Microscanner
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- General Purpose Inclinometer
- Formation Microscanner Dipmeter

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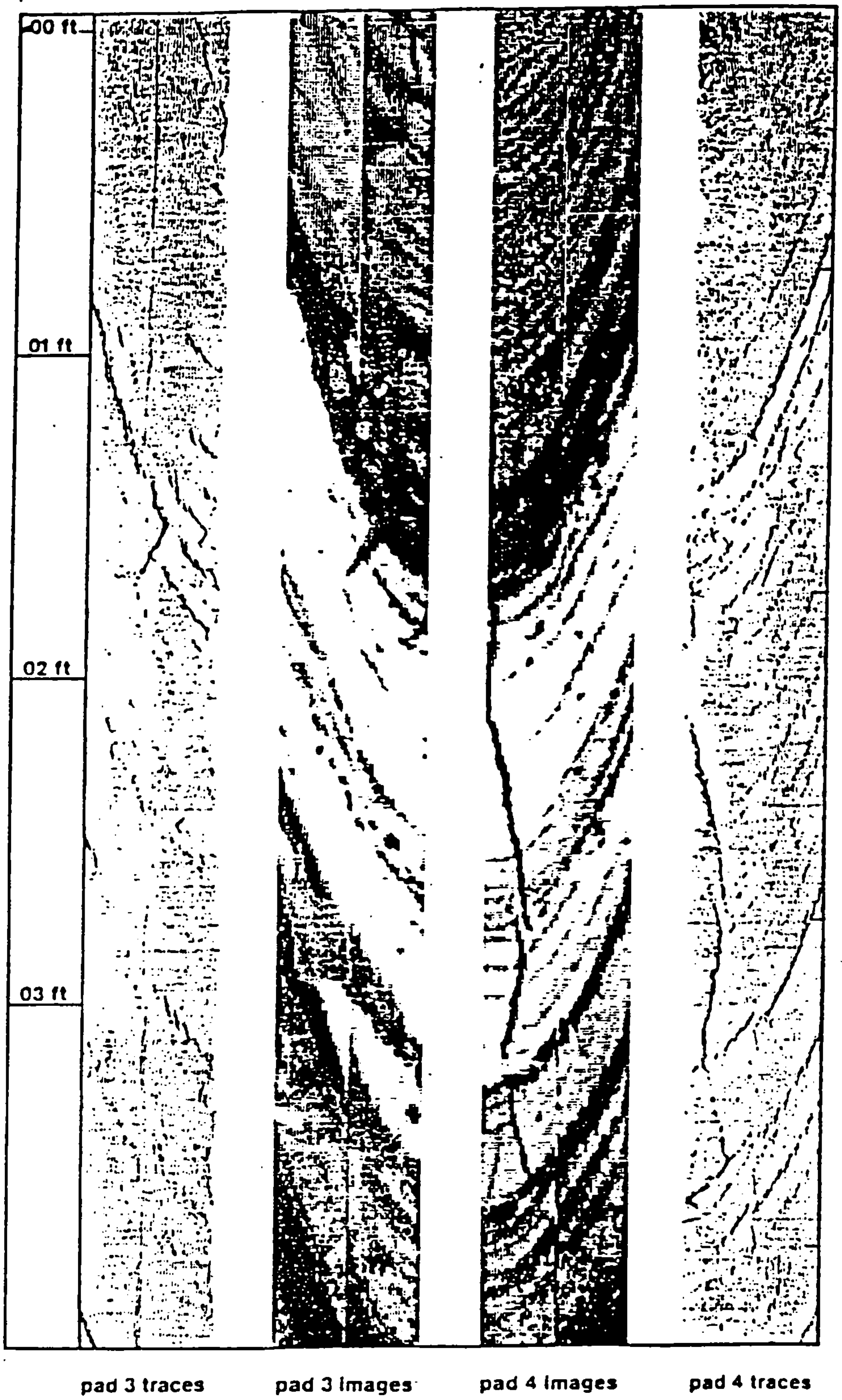

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Phasor Induction

Litho/Porosity
Natural Gamma Spectral
Neutron Porosity
Lithodensity Caliper

Geochemistry
Natural Gamma Spectral
Neutron Porosity
Aluminum Activation
Induced Gamma Spectral

Formation Microscanner
Natural Gamma Spectral
General Purpose Inclinometer
Formation Microscanner Dipmeter

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RECEIVED
OCT 28 1991

OHP meeting 1-3 October 1991 Yamagata: EXECUTIVE SUMMARY

1. OHP, regretting the absence of Dmitriev (unable to obtain a visa in time) urges........ JOIDES office to agree thematic panel meetings as of the PCOM meeting at which the minutes proposing the next meeting are received so that meeting notices can go out in good time and local hosts can make plans.
2. OHP, while disappointed at the response to the call for S-proposals, urges PCOM to retain the experiment, pointing out that all the three proposals received a fairer hearing than they would have done had they been made "informally".
3. OHP urges PCOM to incorporate a very brief coring of the Santa Barbara Basin in the 1992 drilling plan, despite the fact that a formal S- proposal was not received for this site.
4. OHP urges PCOM NOT to schedule proposal S-3 (cased hole for emplacing a seismometer). It clearly cannot be accomplished within the guidelines published for S-proposals and thus would take a disproportionate amount of the time available for scientific drilling on leg 145. If PCOM finds it essential to schedule this, the time should be divided among several legs so that no one leg loses more time than was allotted when the S-proposal concept was agreed. A change of port-call to Anchorage might be a way of alleviating the imbalance.
If PCOM do schedule S-3 it will at least require dropping either all but the APC coring at Site DS-3 (eliminating the major Mesozoic opportunity for Leg 145) or dropping all but the APC coring at site DS-1 (eliminating the major Paleogene opportunities for Leg 145). OHP were almost evenly split as to which of these is the more important and the final decision should be taken in consultation with the co-chiefs.
5. OHP make several recommendations based on the successful completion of Leg 138.
6. OHP urge PCOM and EXCOM that the MOU should be reworded to eliminate the obligation for TAMU to invite a co-chief from each non-US member each year. All non-US members present individually supported this motion, urging that while the right to participate is immensely valuable, the right to act as chief-scientist is not.
7. Prioritising the North Atlantic Prospectus, OHP ranking is:
   1. North Atlantic Gateways Leg 1 (unanimous)
   2. New Jersey Sea Level
   3. Ceara Rise
   4. NARM-volcanic leg 1, E Greenland
   5. Equatorial Atlantic
   6. NARM-non-volcanic leg 1
   7. Alboran Sea
8. OHP draw attention to two important opportunities in the North Atlantic to achieve very exciting science with very little drilling time:
   1. Bermuda Rise (from proposal 404) a single APC site giving ultra-high resolution records that will be comparable with the records from the Greenland Ice Core drilling that is in progress.
   2. Hatton-Rockall Bank, location as Site 116 (from proposal 372 but also satisfying a major part of Broecker *et al* proposal 406), again will have important impact outside the ODP community.

OHP recommends PCOM to schedule these if the opportunity arises.

9. OHP will be delighted if PCOM appoints Peggy Delaney to replace Shackleton in the chair and has suggestions for replacements for retiring members.

000550

Ocean History Panel met from 1-3 October 1991 in Yamagata, Japan

Day 1

The meeting convened at 9.00 on 1 October with a welcome from H. Okada, local host.

Present: Members - J. Barron, W.A. Berggren, T.J. Bralower, J.E.T. Channell, M.L. Delaney, R. Gersonde (FRG, alternate for Wefer), T.D. Herbert, A.C. Hine, E. Jansen, T. Loutit, A. Mix, H. Okada, L. Pratt, N.J.S. Shackleton (chair), E. Vincent

H.Jenkyns (PCOM liaison)
G. Smith (LITHP liaison)
W. Sager (invited guest)

P. Davies (Australia) and P.W. Swart (SGPP) were unable to attend due to the Leg 133 post-cruise meeting.

Okada reported that, although Dmitriev had made a reservation, he was in fact unable to attend because he had been unable to obtain a Japanese visa in time.

NJS reported that Audrey Meyer had telephoned to apologise for the fact that it would be extremely difficult for TAMU to send a representative to the meeting, but had offered to send any information we required or respond to any request from the meeting. She did FAX the drilling-time estimates of Leg 145 as requested.

While accepting the pressure on the time of TAMU scientists, OHP reiterate their feeling that it is very important that the thematic panels have the contact with operations that is provided by the presence of a representative from TAMU.

Noting the difficulty for Dmitriev had been the lead time for obtaining a visa, and noting also that for the second meeting in succession neither Davies nor an alternate had attended, NJS reported that at the last Panel Chair's meeting (December 1990) he had requested that Thematic Panel meetings be authorised earlier. He explained that the official stumbling-block is that PCOM chairman has to approve the draft agenda and the meeting time-and-place at the same time; the agenda cannot in principle be set until the minutes of the PCOM meeting have arrived. He argued that the reality is that there MUST be a thematic panel meeting at such a time that the ranking information and minutes be in the agenda book for the winter and spring PCOM meetings; that the only way to get full attendance is to agree a meeting time at the previous meeting; that it is essential that the meeting place is agreed and provisional hotel bookings be made well in advance; that it puts an unfair strain on the host not to be authorised to firm up any arrangements; that the basic items in the draft agenda are mainly known anyway; and that since PCOM accepts the panel minutes, including the proposed meeting place and date, in their agenda book, it would be extremely simple to have that acceptance constitute formal authorisation (or otherwise). OHP requested NJS to re-open this issue.

With regard to the minutes of the previous meeting:

NJS reported that PCOM did not set up a Bering Sea Working Group as requested by OHP and that in due time OHP may need to take another initiative to ensure that a good, well balanced proposal, taking account of Soviet Union interests in addition to those in previously highly-ranked proposals.

The OHP suggestion that JOIDES Office supply review form templates on disk was not thought useful because JOIDES Office prefers to keep track of the actual review forms distributed.

PCOM report (Jenkyns)

1. S-proposals. PCOM ranked S-3 (OSN-2) highest and moved to consider only this one for scheduling in FY1992. Discussion for this constituted a separate OHP agenda item. However, OHP believe that PCOM chairman misled PCOM in stating (PCOM page 31) that the 4-day limit in S-proposals was only "the spirit of the understanding"; it was clearly intended and this limit was clearly stated in the advertisement. On the receipt of S-1, NJS explicitly requested the JOIDES office to draw the attention of the proponent to the fact that their proposal exceeded this time limit.

2. PCOM moved to discontinue the S-proposals experiment, while encouraging the submission of proposals requesting less than one leg of drilling.

In discussion, OHP were in favour of retaining the experiment. Despite the fact that the response had been disappointing the truth is that three proposals for limited science got a fair hearing. By contrast, PCOM chairman advised Sager to make his suggestion for additional science on leg 145 direct to OHP. OHP did not, as a result, have any indication as to how highly other panels rated the suggestion.

OHP were disappointed that the Santa Barbara Basin proposal had not appeared as an S-proposal; NJS reported that he had written to the JOIDES office asking them either to circulate (the relevant part of) the existing proposal as an S-proposal, or to write to the proponents asking them to resubmit it in this form. His concern was that since the Santa Barbara Basin hole had been frequently cited as an example of an appropriate S-proposal, and indeed OHP had requested its incorporation in the program, the proponent might assume that it was already being considered under that heading.

PCOM moved that S-2 (to log Site 801) be incorporated in the prospectus of legs 143/144 as an alternate site. Sager pointed out that a difficulty with this proposal is that the work would need to be done early in Leg 143. NJS read a letter from Rea pointing out that in terms of agreed priorities, the deeper part of site Pel-3 would be that part of the program that would be dropped to accommodate S-2. On discussion, OHP agreed that they should communicate their view on this option since the panel has an interest in Leg 143, and passed the following motion:

"Given the special circumstances and the unique opportunity represented by logging the very old crust at site 801, OHP are willing to see one of the lower-ranked objectives in this leg sacrificed or modified at the discretion of the co-chief scientists in order to allow a specified and limited amount of time (less than 3.3 days) to be spent logging Hole 801C" (for 11; against 2).

4. PCOM has agreed a procedure for judging proposals "inactive". OHP welcomed this and accepted that this puts some responsibility on the thematic panels to ensure that proposals in which the panel has an interest are not allowed to become "inactive".

5. PCOM has approved limited time being devoted to testing the capability of JOIDES RESOLUTION to drill in shallow water by drilling in the Eniwetak lagoon. It was not clear to OHP exactly what was being tested and to which proposal this might be relevant.

Leg 145 business

OHP objected to the statement in the PCOM minutes that Leg 145 was still in planning stage and reported that PCOM chairman had thanked him for efficiently achieving this planning at the March OHP meeting. After explaining the background to Sager's presence, Sager presented his rationale for requesting deeper drilling at site DS-1 to determine the palaeolatitude of the seamount and hence to determine the drift in the hotspot reference frame.

OHP were impressed by Sager's arguments. However, it was pointed out that at the March OHP meeting it had been far from clear that site DS-1 would reach basement at all; at the site presented it is evident that there is a potentially very exciting 500m sedimentary section to be recovered, but that this may overlie reef material rather than the basement. OHP would be happy for this to be done if the opportunity presents itself but would not advocate putting it in the scientific prospectus unless data not so far seen by OHP exists supporting the notion that there is basement below about 500m of sediment, the following resolution was passed:

"There are currently basement objectives on Leg 145 schedule. From the OHP standpoint, penetration into the basement at DS-1 (for defining palaeolatitude) would be of greater interest than would recovering basement at PM-1 (for geochemical objectives) as it is more consonant with the overall objectives of the leg, and would prefer to see basement at PM-1 included as "second priority" to be drilled only if time is made up in the long transit from the DS sites and in the coring of NW4. The ordering NW-1; DS-3; DS-2, DS-2A, DS-1 would enable maximum time to be devoted to DS-1 basement if it does prove to be attainable.

The next agenda item was the S-3 proposal. NJS explained that notwithstanding OHP's clear lack of enthusiasm for this proposal we are obligated to advise PCOM what should be dropped if this program is included. In discussion, all the four possible options were considered:

1. eliminate PM-1.
2. eliminate NW4 and DS-2 or DS-2A.
3. reduce DS-3 to 2APC/XCB, eliminating Palaeogene and Mesozoic objectives.

4. reduce DS-1 to 2APC/XCB, eliminating Palaeogene and Mesozoic.

Each of these options would probably release enough time assuming that the estimate of 6.6 additional days' work given by TAMU is correct.

Statements given below summarise the science lost by each option:

Option 1. Eliminate PM-1. Leg 145, North Pacific Neogene Transect, was constructed with major input from three proposals; eliminating Site PM-1 would eliminate one of these three entirely. The chief objective of the site is to obtain a good Neogene sequence containing carbonate microfossils. There is no APC-cored site in the East Pacific north of the Gulf of California! The potential of this site is too high for it to be sacrificed.

Option 2. Elimination of Site NW4A (and, possibly, DS-2A as well). Site NW4A will provide the end of a high-resolution transect that records the surface-water palaeoceanography and aeolian transport of the North Pacific. This site is expected to generate an excellent bio-siliceous record, with first-rate palaeomagnetic time control for the history of the Subarctic Front. The base of the high-resolution part of the section will determine the timing and nature of the onset of high productivity in the North Pacific. Below this, there will be an important low-resolution history of Cenozoic and Mesozoic ocean history; the Mesozoic part will probably be especially interesting as the palaeodepth will give us a carbonate record on oceanic crust whose age will also provide critical information for plate reconstruction (Aptian/Barremian, if the Chinook palaeoplate model is correct). Eliminating this site would be grossly unreasonable since it is a major interest of one chief scientist (a proponent).

Option 3. Eliminate deeper drilling at Site DS-3. The seismic record indicates that the Cretaceous/Palaeogene record at Site DS-3 is expanded and relatively complete. Recovery of this section during Leg 145 will provide a critical, detailed record in a region where very little of this time interval exists and where previous sections are poorly recovered and/or condensed and/or riddled with hiatuses. In addition, the proposed site will be among the highest latitude Cretaceous sections recovered from the Pacific and will thus have profound palaeoceanographic implications (existing Cretaceous/Palaeogene latitudinal temperature gradients have no high latitude Pacific data points). The age of the crust is uncertain and its determination is a significant aspect of this site; clearly it is older than the Detroit Seamount and will carry the Cretaceous record that is not present on the seamount itself.

Option 4. Eliminate deeper drilling at DS-1. Drilling at proposed site DS-1 below APC depths will recover a lower Neogene to uppermost Cretaceous sequence. Due to the shallow palaeodepth, this site is likely to possess a good carbonate record that will be especially valuable since it is not deeply buried and should not be diagenetically altered. Recovery of this lower Neogene and Palaeogene record is extremely important from a palaeoceanographic viewpoint as the majority of existing contemporaneous sections in this region are characterized by a moderately to poorly preserved carbonate record. A well preserved carbonate record from the North Pacific is vital to documenting the structure and mechanism of Cenozoic cooling. In addition, proposed drilling at DS-1 includes a basement objective to obtain an age and palaeolatitude for Detroit Seamount. Palaeomagnetic and radiometric studies of basement may provide definitive data on hotspot migration and true polar wander. This information will have palaeoceanographic as well as palaoetectonic implications as it will provide tight constraints to the presently poorly-defined Pacific plate reconstructions.

In voting there were no votes for option 1; 2 for option 2; 5 for option 3; 7 for option 4.

OHP were unanimously against the concept of such a high proportion of the scientific content of a drilling leg in favour of a program that has no immediate scientific content whatever, no assured utility (particularly in the near future) and no prioritisation, and is not within the specifications publicised for S-proposals (which were quite explicit and clearly intended to ensure that an S-proposal did not consume a significant part of a leg). If PCOM insists on scheduling this (presumably for political rather than scientific reasons) they should lengthen the leg and change the port-call from Victoria to Anchorage.

Leg 138 report

Mix presented a review of the results of Leg 138, concentrating on aspects that may have implications for future OHP-promoted legs.

1. The digital colour-scanner was extremely successful, providing a detailed (3cm resolution) record of virtually all of the 5.5km of core recovered.
2. The use of the GRAPE density, magnetic susceptibility and colour records enable the party to assure complete recovery of the sedimentary section before leaving each site.
3. This enabled the party to generate unusually precise biostratigraphy and to achieve many objectives that would normally require much post-cruise effort.
4. This in turn meant that there was no sense that the scientific party was too large.
5. It was demonstrated that even with a nominal 100% recovery, over 10% of the section is nearly always missed between adjacent APC-cores (and a greater proportion with the XCB).
6. High-resolution sampling was deferred to the first post-cruise meeting.
7. The vast amounts of data generated could not have been handled without the three Sun workstations that were brought on board by the Oregon group.
8. JOIDES Resolution is an excellent vessel for this type of work although significantly better quality recovery would result from an improved heave compensator.

OHP made the following recommendations after the discussion following Mix's presentation:

1. ODP should purchase a digital colour scanner which will certainly have application on legs 143-145. This must include appropriate computing equipment for data acquisition, manipulation, storage and transfer.
2. Bearing in mind that other tools are likely to be added for continuous core scanning, data generation is likely to increase; the ship's computing system must be upgraded to anticipate this trend.
3. Related to the above, a second computer systems manager (or person of equivalent

4. Technician assignments should be flexible; some of those recruited should have the background and interests to enable them to be assigned to the palaeo-lab without engendering complaints.
5. The engineers should seek to improve the APC and XCB in the light of the documentation on Leg 138 of the amount of stretching that they generate.
6. The shipboard palaeontology reference collection must be rebuilt and maintained.

OPCOM

Delaney reported on the OPCOM meeting which she attended in place of NJS (who was at sea). She reported that as mandated by OHP members polled, she recommended that further expenditure on new developments should be focused on the Diamond Coring System; this is regarded as the best hope for significant improvements in the drilling and recovery of chert-chalk sequences such as must be represented in some of OHP's highest priority objectives.

Proposal Reviews

An unusually large number of new proposals was received for review. After reviewing these, OHP agreed that they include a large number of exciting proposals both within and outside the OHP mandate. OHP is not in favour of ODP making such a commitment to multi-leg programs as to exclude the increasingly large community that is seeking to play a part in having input to the program.

Santa Barbara Basin

Barron circulated a document from Kennett that constitutes a late proposal for inserting a single site in the Santa Barbara Basin into the FY1992 schedule. OHP unanimously endorses this request, as OHP unanimously endorsed a similar suggestion last year. This site is included in proposals 271 and 386. The known existence of sand turbidites in the SBB does not seriously affect the value of the proposal and indeed the timing of these may have considerable interest in relation to earthquake frequency since the recurrence interval will be accurately determinable.

Co-chief scientist selection

NJS related the history of the selection of co-chief scientists for Leg 145 (OHP minutes; PCOM minutes; letter from Stein withdrawing his acceptance; letter form NJS to Mayer explaining OHP's recommendation). Although the matter is now concluded satisfactorily, there are two items of concern:
1. Given that the relevant thematic panel members are almost certainly closer to the objectives of a leg, and better acquainted with the individuals involved in its planning, OHP was concerned at the extent to which PCOM's list of recommended co-chiefs differed from the OHP list (especially as the PCOM list incorrectly listed Rea as a non-proponent).
2. More seriously, OHP unanimously recommend that the MOU be reworded to ensure

that co-chief scientists are NEVER selected for political reasons in such a manner that either the science or the scientific opportunity of proponents (who have probably worked long and hard through the planning process) are threatened. All non-US members present explicitly and individually supported this motion, expressing the view that while the opportunity to participate is of great importance to individuals in the non-US countries, the opportunity to act as chief-scientist is not of comparable importance (indeed it is a much heavier burden for most non-US scientists because of the language barrier).

North Atlantic Program

The third major item of business was the ranking of the programs/legs in the North Atlantic Prospectus with a view to assisting PCOM in generating a drilling program for FY1993 (bearing in mind that PCOM will probably schedule only four legs since the present phase of Pacific drilling will extend by two legs into FY1993).

Voting procedure. After discussion, the prospectus was divided in two halves: three programs that are of considerable interest to OHP and four further programs that have slight interest to OHP. These were voted on separately with Shackleton and Jansen (proponents) absent for the ranking on the first three. A separate vote was held for each ranking place. The ranking follows:

1. NAAG Leg 1 (see note below)	13/13
2. NJ Sea-level	11/13
3. Ceara Rise	13/13

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4. NARM-volcanic -leg 1 E Greenland	13/15
5. Equatorial Atlantic	9/15
6. NARM non-volcanic leg 1	14/15
7. Alboran Sea	14/15

OHP also discussed proposals not included in the prospectus. One aspect is the possibility of drilling in the Caribbean region during transit. Drilling of proposal 403 (Chicxulub crater) would have considerable publicity value for the Ocean Drilling Program and would certainly not raise objections from OHP as it seems also to achieve at least a degree of success. However, the sober view is that a much better proposal will probably result from the review process. If PCOM do wish to schedule this program immediately, it could easily be combined with a portion of another proposal in the region to make up a full leg.

Finally, OHP wish to advocate two "Single Sites of Opportunity" for consideration if they fall close to the ship track during the year:

1. The single Bermuda Rise site in proposal 404. This site will produce a unique ultra-high resolution record for the past few glacial cycles. Even a 30 metre giant piston core barely reaches the last interglacial at this site and a record with a comparable detail and temporal coverage to the soon-to-be-completed Greenland Ice core would generate considerable scientific interest extending well outside the ODP community. Drilling this site is clearly a viable stand-alone program.

2. An APC coring of Site 116 as proposed in 372 and exactly satisfying (but with greater confidence) an important component of proposal 406 (Broecker *et al*). It is extremely difficult to obtain palaeoceanographic records of the world's intermediate watermasses. OHP have solicited a proposal to address this problem globally and this would necessarily involve a small number of isolated sites only one of which could be tackled on any drilling leg. At 1100m water depth this is a prime site (and probably would be the most important in a global intermediate-water array), as is made very clear by the proposals of Broecker *et al* (406) and of Zahn (372). Again, this would have important impact value outside the ODP community, and again it is fully viable as a stand-alone program.

Note re NAAG Leg 2

North Atlantic Gateways WG recommended two legs be devoted to this program and that they be separated by a year so that they can both be drilled in the optimum weather window so as to maximise the chances of obtaining the northernmost sites. Since the WG was dissolved, several new proposals and letters of intent have come in for work on the North Atlantic Gateways' problems. Although OHP are fully confident that the program as presently constructed by NAGWG provides an excellent two-leg program, the panel would prefer to see a two-year gap between the two drilling legs. This will enable the second leg to be planned, taking account of new input and of the findings of the first leg. OHP recommends (assuming NAAG leg 1 is scheduled for summer 1993) that PCOM set up a DPG to meet early in 1993 and again almost immediately after this leg ends to finalise a program for a second leg that can be considered at the fall 1993 OHP and PCOM meetings for drilling in summer 1995. This will give more scientist the opportunity to have input in the planning process and will result in better scientific returns to be obtained.

Other business

Bergrren suggested that members rotating off the panel should pass on material (especially drilling proposals) to their successors on the panel. This was judged an excellent suggestion.
NJS reported that he had asked JOI-USAAC to automatically add new panel members to their mailing list, and to automatically send such things as the COSOD documents to new panel members. It would be useful if they were to automatically send reports of JOI-USAAC workshops to all members of the relevant thematic panel(s) (including non-US members) since the chief purpose of funding these workshops is to assist the planning process.
It was agreed that it is difficult for new members to immediately start to contribute to the work of the panel and that any help of this kind would be welcome. Possibly JOIDES office could consider what help or advice they can give (eg give a list of documents that a new thematic panel member ought to obtain: panel white paper, COSOD report to new members on acceptance).

Loutit and the panel welcomed the procedure followed for the first time at this meeting whereby proposal reviews were completed and circulated to members before the meeting closed.

Letters of intent: OHP discussed all the letters of intent circulated to NJS, and individual panel members offered to contact the writer in many cases.

OHP note that Coffin will generate a new Somali Basin proposal in due course; in the meantime OHP will not forget the interest in this proposal. NJS "reminded" OHP that it missed drilling in the previous Indian Ocean circuit because of perceived technical difficulties rather than because of its ranking by SOHP.

NJS apologised for his lack of success in obtaining liaison to SGPP. It was agreed that the best policy would be to appoint a new panel member as liaison immediately - the panel noted that the consistent presence of Guy Swart as LITHP liaison had been exemplary. For the next SGPP meeting, NJS agreed to as liaison.

Panel Membership

Shackleton (having grossly exceeded any reasonable term on an ODP thematic advisory panel) will rotate off OHP at the end of his term as chair. Mix, Delaney and Berggren have completed three years on OHP but Delaney has expressed willingness to take over the chair and will probably be replaced by Weaver (a sedimentologist/biostratigrapher. OHP made a long list (over a dozen names) of possible new members. Taking account of the expertise required as well as of factors that may render some of the individuals unacceptable to PCOM at present, OHP request PCOM to appoint W Ruddiman and D Hodell. Failing Ruddiman, OHP would recommend Raymo; failing Hodell, OHP would recommend Zachos (but if PCOM cannot appoint either Ruddiman or Hodell, OHP would recommend Raymo and Kennett because of the need to keep a balance of experience). This recommendation was generated by discussion towards "unanimous consensus" rather than by voting.
NJS thanked Bill Berggren and Alan Mix for their service on OHP, and Guy Smith for his excellent work as liaison from LITHP.

Next meeting

Hine volunteered to host the next meeting in St Petersburg, Florida, 5-7 March 1992.

Since the next Palaeoceanography conference will be held in Kiel, Germany in September 1992, the panel would like to meet at a time close to that. Vincent offered to host a meeting in Marseilles, France and tentative dates of 27-29 September or 28-30 were suggested.

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SEDIMENTARY & GEOCHEMICAL PROCESSES PANEL MEETING

Geological Institute
ETH-Zentrum
Zürich, Switzerland

8-9 November 1991

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EXECUTIVE SUMMARY

1. OPCOM MONEY AND FLUID SAMPLING:

SGPP expresses its concern that adequate progress has not been made in the development of the new technologies required for *in situ* pore fluid sampling and downhole property measurements, such as pressure, permeability and temperature. SGPP strongly recommends that some OPCOM money be allocated for the development of the needed tools. SGPP proposes an integrated approach to the fluid sampling problem by maximizing the use of currently available technology to address short-term goals while continuing to develop new tools for improving and extending our capabilities to reach long-term scientific objectives. SGPP supports the continued development of Geoprops by B. Carson, but would also propose to have funds allocated for testing the Top Hat devise during FY92. SGPP emphasizes that, even without Geoprops, important fluid sampling objectives can be achieved on Leg 146, Cascadia Margin, using available tools (WSTP, PCB, CORK) and techniques (squeezing and rinsing). SGPP made specific recommendations and widely circulated a technical plan for processing water and gas samples obtained with the pressure core sampler (PCS-Phase II). See minutes of 5-7 March 1991 meeting at College Station and Gas Hydrate Report. SGPP supports and seconds the TECTP/LITHP joint motion on fluid sampling and endorses the report of the JOIDES Working Group on *In Situ* Pore Fluid Sampling.

2. SUPPLEMENTAL SCIENCE PROPOSALS:

SGPP supports PCOM's decision to discontinue supplemental science proposals. SGPP strongly encourages the continued submission of less than one leg proposals to be handled under the normal ODP review policy and introduced into the planning of legs at an earlier stage. SGPP recognizes that certain "emergency" cases involving technical problems or opportunities to rectify or enhance scientific objectives will arise from time to time and urges that a certain amount of flexibility be maintained in the drilling schedule to accomodate such operations.

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A. S-2 Downhole Measurements in Jurassic Oceanic Crust in Hole 801C

SGPP supports supplemental science proposal S-2 to log Hole 801C during Leg 144 because of the potentially valuable scientific information that will be obtained from the downhole measurements to be performed on the oldest drilled oceanic crust. SGPP recommends that the logging of Hole 801C be given first priority status on the condition that logging time be gained through the sacrifice of drilling time for basement penetration at mid-latitude sites, as specified by LITHP/TECP during their fall meeting.

B. S-3 Ocean Seismic Network (ONS-2)

SGPP does not support supplemental science proposal S-3 because the necessary experimentation at the first hole has not been made, the need for drilling a second hole does not seem to be warranted at this time and the 6-8 days needed to complete ONS-2 do not meet the time criteria of a supplemental science proposal. Although SGPP has no thematic interest associated with the OSN, it recognizes its scientific importance and encourages the submission of less than one leg proposals to drill future dedicated OSN holes.

3. PROPOSAL/NORTH ATLANTIC PROSPECTUS REVIEW:

SGPP reviewed 9 new proposals and 13 new additions or revisions to older proposals. In addition, SGPP discussed the contents of the North Atlantic Prospectus. In its ranking of proposals in the Prospectus, SGPP elected to include a new proposal (Amazon Deep-Sea Fan, No. 405) and to vote separately on the two Mediterranean proposals (Alboran Basin/Gateway (No. 323) and Mediterranean Ridge (No. 330). The N. Atlantic Rifted Margins proposal (NARM) were divided into non-volcanic and volcanic components for the ranking. Thus, SGPP ranked a total of 13 proposals. As required by PCOM, proponents left the room during the discussion of their proposals and did not rank their own proposals during the ranking of proposals for FY93.

4. SGPP RANKING OF NORTH ATLANTIC PROSPECTUS LEGS:

Rank	Proposals	Score
1	New Jersey Sea Level (348)	12.2
2	Mediterranian Sapropels (391)	9.7
3	Amazon Deep-Sea Fan (405)	9.5
4	Mediterranian Ridge (330)	8.4
5	TAG Hydrothermal (361)	8.0
6	Ceara Rise (388)	7.4
7	Alboran Basin (323)	7.0
8	VICAP Gran Canaria (380)	6.4
9	N. Atlantic Arctic Gateways ((NAAG)	5.7
10	N. Atlantic Volcanic Rifted Margins (NARM)	5.3
11	Mar Offset Drilling (OD-WG)	3.6
12	Eq. Atlantic Transect (346)	3.5
13	N. Atlantic Non-Volcanic Rifted Margins (NARM)	3.4

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Executive Summary of the first meeting of the

OFFSET DRILLING WORKING GROUP

held at Woods Hole Oceanographic Institution; 12-15 August 1991

Abstract: The Working Group defined as its main objective the identification of target areas or 'natural laboratories' within the main ocean basins at each of which several drill holes, 1000±500m in depth, could address many of the objectives of offset drilling. Although considerable progress was made in defining a short-list of areas from which such laboratories might ultimately be chosen, it was recognised that it could be several years before such a main phase of systematic offset drilling could be incorporated into the ODP. In the meantime it was felt that an excellent start could be made in determining the oceanic crustal and upper mantle section, and the processes occurring within it, by adopting the very promising offset drilling strategy on several upcoming Legs of the drilling program. In particular the Group's global review of potential target areas revealed that most of the best prospects for achieving offset drilling objectives, on the basis of existing knowledge, are in the eastern Pacific and north Atlantic, areas in which the JOIDES-Resolution will be operating within the next few years.

1.0 Provisional elaboration of remit

The Working Group quickly reached a consensus on the following points:

1.1 Its primary remit is to identify areas in which tectonic windows into the oceanic crust and upper mantle facilitate the siting of drill holes which start at a stratigraphic level within the lower part of Layer 2, or below this level.

1.2 These target areas should be within the main ocean basins, with the aim of establishing the crustal section and crustal processes associated with mature, mid-ocean, ridges.

1.3 Holes drilled within an offset drilling strategy will probably be 1000±500m in depth.

1.4 The Group should devise an 8-10 year program, involving 10-12 two-month Legs, in the hope of drilling 15-18 holes.

1.5 The Group should consider a two-phase program. The first phase, which might last for 2 or 3 years, would involve drilling at promising sites which can be identified on the basis of existing site survey information and are in areas which are good prospects for phase 2 drilling. Phase 2 would consist of drilling in a limited number of 'natural laboratories' - locations at which many or most objectives could be addressed by drilling several holes in the same area.

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1.6 The Working Group felt that the objectives of offset drilling were well-documented and summarised in the 1989 JOI-USSAC Workshop Report entitled "Drilling the Oceanic Lower Crust and Mantle".

1.7 A notional allocation of Legs to primary objectives might be as follows:-

	Number of Legs
Multiple penetrations of the Layer 2/Layer 3 boundary	2
Long holes within Layer 3	2
Nature of seismic and petrologic MOHO	4
One or more upper mantle holes	2
Hole(s) through active transform fault zone	1
Hole(s) through median valley master fault	1
	12

2.0 Consideration of possible target areas

In an initial, global, review of potential target areas the Group identified 22 locations at which the objectives of offset drilling might be achieved. These locations were equally divided between crust formed at fast and slow spreading centres, i.e. between the Pacific and Atlantic/Indian oceans respectively. 12 were sections exposed on scarps or transverse ridges associated with transform faults; 3 were exposures within the median valley of rifted ridges on possible 'master' or detachment faults; 4 were sections exposed by crustal extension of pre-existing crust, typically ahead of propagating ridges; 1 was exposed by late-stage extension on an abandoned ridge crest; and 2 were the result of overthrusting within pre-existing crust.

Each of these areas was then assessed against a list of 20 objectives and criteria which one would hope to satisfy in devising an offset drilling program. As a result of this exercise the list was reduced to 12 areas, again equally split between sections formed at fast and slow spreading ridges. Although designed to ensure adequate coverage of all objectives there is at present some duplication in this list. With further information and discussion the Group is confident that it can produce a short-list of perhaps 8 or 9 areas. It seems unlikely that, within the life-span of the Working Group, it will be possible to refine this short-list further. The final selection of perhaps 3 or 4 'natural laboratories' will depend in part on the results of phase 1 drilling, but in particular on the results of additional site surveys.

3.0 Site Survey requirements

Ideally within an offset drilling laboratory the relationship of each drill site to the regional structure, to other sites, and to the ridge that produced them should be documented. The extent to which this can be achieved should be a major criterion for the selection of the laboratory areas.

The Group anticipates that site surveys will need to include:
1. near-bottom side-scan imaging
2. extensive submersible dives and sampling
3. near-bottom gravity and magnetics
4. high resolution near-bottom seismic imaging
5. multichannel seismic-reflection profiling.

The aim should be to construct, to the extent possible, a geologic map and accurate true-scale, balanced cross-sections locating the proposed sites in their structural contexts.

These survey requirements are of a magnitude that requires greater resources and co-ordination than hitherto, and additional site survey funds should be budgeted for in an offset drilling program.

4.0 Technological requirements

One of the great attractions of an offset drilling strategy is that it should not involve technological capabilities and developments beyond those which currently exist or are anticipated within the next few years. However the Group recognises that the routine provision of some of the developments currently in hand could be crucial to the success of an offset drilling program.

The following capabilities are considered to be particularly relevant to offset drilling:
- the Hard Rock Guide Base, ideally modified to cope with slopes up to 35°, and with an anchoring mechanism
- the Hard Rock Drill-in Casing,
- the Hard Rock Spud-in with Downhole Mud Motor
- a commandable on-off beacon with long battery life
- the Electronic Multishot Orientation Tool

- in principle the Diamond Coring System could be very relevant but the Group were concerned that core orientation and a full suite of down hole measurements might not be available with this system because of the narrower hole.

5.0 Phase 1 of an Offset Drilling program

In making its global review of potential target areas the Group identified six areas in which drill sites could be proposed on the basis of existing site survey information. Moreover additional site surveys are scheduled for most of these areas in the near future.

The six areas are Hess Deep, MARK, 15° 20'N on the mid-Atlantic ridge, and the Vema, Atlantis II and Blanco fracture zones. A brief outline of the principal offset drilling objectives in each of these areas is given below:-

1. Hess Deep
Primary objective is to drill a long section of gabbro, with the possibility of penetrating the Moho.

2. Mark
Two 500m holes could be drilled, in gabbro and peridotite respectively. These holes might also provide information on the transition between Layer 3 and the Mantle, and test the hypothesis of a 'master' or detachment fault.

3. 15° 20'N
Two or three 500m holes could be drilled in both unaltered and hydrothermally altered ultramafics in this geochemically 'enriched' area. The primary objective would be to elucidate the nature of the upper mantle and parental magmas in such an area.

4. Vema F.Z.
Two or three holes, perhaps 300-500m in length designed to penetrate the Layer 2/Layer 3 transition and to deduce the tectonic evolution of the transverse ridge.

5. Atlantis II F.Z.
The flat, hard rock platform of this transverse ridge, at relatively shallow depth and with all units outcropping, offers excellent prospects for 'stratigraphic' holes at virtually all levels. However the first objective would probably be to deepen hole 735B.

6. Blanco F.Z.
The Layer 2/Layer 3 transition is particularly well mapped in scarps flanking the Blanco Trough making this an excellent prospect for multiple sections through this transition.

Experience at site 735B on the south-west Indian Ocean ridge and on the Troodos ophiolite of Cyprus suggests that drilling plutonic rocks is much easier than drilling extrusives and dykes. The Group feel strongly therefore that to maximise the chances of early successes, both in terms of the amount of drill core recovered and the number of new objectives addressed, the first drill holes designed to contribute to an offset drilling program should be sited in gabbros or ultramafic rocks.

The Group also noted that four of the six areas identified above are in the eastern central Pacific and the north Atlantic, where the JOIDES-Resolution will be operating within the next few years. The Group expressed the hope therefore that the Chairman's Executive Summary of the meeting might be made available to the JOIDES office in time to influence the planning of the North Atlantic Prospectus.

6.0 Further meetings

The Group requested that it be allowed to meet on two further occasions, i.e.

February 3-6, 1992 in Miami (host: Jim Natland)
May 18-20, 1992 in Paris (host: Catherine Mével)

Fred Vine
28 August 1991

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Minutes of the first meeting of the OFFSET DRILLING WORKING GROUP

held at Woods Hole Oceanographic Institution, Massachusetts, 12-15 August 1991

Present: Ernesto Abbate, John Casey, Henry Dick, Catherine Mével, Eldridge Moores (TECP), James Natland (PCOM), Kazuhito Ozawa, Jason Phipps-Morgan (LITHP), Gene Pollard (TAMU/ODP), Alex Sobolev (Observer), Brian Taylor (PCOM), Fred. Vine (Chair).

Apologies for absence were received from: Joe Cann, Jeff Fox, Karl Hinz, Susan Humphris (LITHP), Jeff Karson (TECP), Paul Robinson, Paul Stanton (TEDCOM), Robert Varga and Lev Zonenshain.

1.0 Terms of reference

PCOM's charge to the OD-WG is as follows:

1.1 Establish and set into priority scientific objectives and a drilling strategy of a program for drilling offset sections of oceanic crust and upper mantle;

1.2 Identify target areas where specific objectives can be addressed;

1.3 Identify other survey information necessary to establish the geologic context of an offset drilling program; and

1.4 Identify the technological requirements to implement the strategy.

2.0 Elaboration of remit

In order to provide a framework for subsequent discussions the Working Group quickly reached a consensus on the following provisional elaboration of its terms of reference:

2.1 The Working Group's primary remit is to identify areas in which tectonic windows into the crust and upper mantle facilitate the siting of drill holes which start at a 'stratigraphic' level within the lower part of Layer 2, or below this level. By definition the Working Group is not concerned with total crustal penetration in a single hole; nor, typically, with holes penetrating the undisturbed sediment/lava interface (i.e. top of Layer 2).

2.2 The target areas should be within the main ocean basins, with the aim of establishing the crustal section and crustal processes associated with mature, mid-ocean, ridges. Should the results of offset drilling show that the sections exposed in ophiolites are not relevant to the main ocean basins, then one might envision a further phase of offset drilling, beyond that under consideration here, in which the primary targets would be in marginal seas, and back-arc and fore-arc basins with the objective of making the 'ophiolite connection'.

2.3 Holes drilled within an offset drilling strategy will probably be 1000 ± 500m in depth, depending on scientific objectives, drilling conditions and logistic considerations.

2.4 The Working Group should devise an 8-10 year program, involving 10-12 two-month Legs, in the hope of drilling a total of 15-18 holes specifically geared to offset drilling objectives.

2.5 The Working Group should consider a two-phase program. The first phase, which might last for 2 or 3 years, would involve drilling at promising sites which can be identified on the basis of existing site survey information and are in areas which are good prospects for phase 2 drilling. Phase 2 would consist of drilling in a limited number (3 or 4?) of 'natural laboratories' - locations at which many or most objectives could be addressed by drilling several holes in the same area.

2.6 The Working Group felt that the objectives of offset drilling were well-documented and summarised in the 1989 JOI-USSAC Workshop Report entitled "Drilling the Oceanic Lower Crust and Mantle", and felt it unnecessary therefore to enumerate them or elaborate on them at this stage.

2.7 A notional allocation of Legs to primary objectives might be as follows:-

	Number of Legs
Multiple penetrations of the Layer 2/Layer 3 boundary	2
Long holes within Layer 3	2
Nature of seismic and petrologic MOHO	4
One or more upper mantle holes	2
Hole(s) through active transform fault zone	1
Hole(s) through median valley master fault	1
	12

The proportion of the program provisionally allocated to defining the nature of the Moho reflects in part the importance attached to this objective, but also the fact that many workers consider that the crust and mantle, and the transition between the two, could be particularly variable, laterally, at this level.

3.0 Preliminary identification of possible target areas

The Working Group then drew up a list of potential target areas, briefly considering the particular objectives that might be achieved at each location, the tectonic and geochemical setting, the extent of existing and pending site survey data, and any particular characteristics, advantages or disadvantages of the area.

3.1 22 areas were identified; eleven in crust formed at slow spreading ridges, in the Atlantic and Indian Oceans; eleven in crust formed at fast spreading ridges, in the Pacific Ocean. A summary listing of the areas is given below.

A. <u>Slow-spreading ridges</u>

(i) Sections exposed on <u>Transverse Ridges</u> formed within the inside or transform corner of ridge-transform intersections

1. Atlantis II F.Z. South West Indian Ocean Ridge 32°40'S
2. Vema F.Z. Mid-Atlantic Ridge 10°40'N
3. Kane F.Z. " 23°45'N
4. Hayes F.Z. " 33°30'N
5. Oceanographer F.Z. " 35°N
6. Kurchatov F.Z. " 40°40'N

(ii) Sites within the <u>Median Valley</u>

7. 15°20'N on the Mid-Atlantic Ridge
8. MARK (Mid-Atlantic Ridge near Kane) 23°20'N
9. 45°N on the Mid-Atlantic Ridge

(iii) Section exposed by <u>extension of pre-existing crust</u>

10. Kings Trough. N.E. Atlantic 43°30'N

(iv) Section exposed by <u>thrusting of pre-existing crust</u>

11. Gorringe Bank. Azores-Gibraltar Ridge 36°30'N.

B. <u>Fast-spreading ridges</u>

(i) Exposures associated with <u>Fracture Zones</u>

12. Blanco F.Z. N.E. Pacific 44°20'N
13. Siqueiros F.Z. E. central Pacific 8°30'N
14. Garrett F.Z. " 13°S
15. Eltanin F.Z. S. Pacific 54°S
16. Udintsev F.Z. " 56°30'S
17. Nova Trough. W. Pacific (1°S; 168°W) extension of Clipperton F.Z.?

(ii) Sections exposed by <u>crustal extension ahead of propagating ridges</u>

18. Hess Deep. E. central Pacific 2°20'N near Triple Junction
19. Pito Deep. S.E. Pacific (23°S) N.E. margin of Easter microplate
20. Endeavour Deep. " (33°S) " " of Juan Fernandez microplate

(iii) Section exposed by <u>late-stage extension on an abandoned ridge crest</u>

21. Mathematicians Ridge. E. central Pacific. 15°N 111°W

(iv) Section exposed by <u>thrusting of pre-existing crust</u>

22. Mussau Trough. W. Pacific. 1°N 149°E.

4.0 Assessment of potential target areas

4.1 The Working Group then drew up the following list of characteristics, objectives and criteria against which each potential target area could be assessed. The object of this exercise was in part to identify the most promising 'laboratories' at which multiple objectives might be met, but also the ensure that any short-list of target areas gave adequate coverage of all the objectives.

Primary objectives forming part of a composite or 'stratigraphic' section: to drill:-
1. Layer 2/Layer 3 transition
2. Long sections through gabbros
3. Layer 3/Mantle transition (MOHO)
4. Upper mantle sections

Objectives requiring a range of geographic locations: to sample crust formed:-
5. at fast- and slow-spreading ridges
6. in a plume and non-plume setting
7. close to and far from fracture zones

Objectives relating to tectonic, magmatic or metamorphic processes: to investigate:-
8. active transform fault processes
9. a current median valley master fault
10. evolution of transverse ridges
11. process of rifting of pre-existing crust
12. off-axis evolution of crust
13. types of deformation in the crust
14. hydrothermal alteration of the crust
15. nature of parental magmas
16. magma emplacement and transport through the crust

Logistic and other considerations:
17. water depth
18. weather window
19. site surveys -existing, pending, proposed
20. age and plate tectonic setting

4.2 The Working Group then constructed a two-dimensional matrix with the 22 potential target areas on one side and the 20 objectives/criteria on the other.

The appropriate characteristics under objectives 5, 6 and 7 above were assigned to each area, and all remaining objectives/criteria scored 3, 2, 1 or 0, eg. depending on whether the prospect of achieving a particular objective at a particular site was excellent, good, fair or bad respectively.

(Clearly these assessments reflected in part the instrinsic potential of an area, and in part our current knowledge of the area based on existing survey information. Incorporation of the latter into the scoring system seems entirely appropriate in that the site survey requirements for offset drilling are particularly stringent (see 7.0 below) and it makes good sense therefore to capitalise on the very considerable sums of research funding already invested in certain areas.)

The following points emerged from this exercise:

4.3 Only one objective failed to attract a '3' rating and this was the all-important Layer 3/Mantle transition. The Working Group felt that nowhere has this been well-established and mapped two-dimensionally as could be said of the Layer 2/Layer 3 transition in the scarps associated with the Vema and Blanco fracture zones or the horsts flanking Hess Deep. Clearly this is a cause for concern and warrants further discussion.

4.4 The Working Group had great difficulty interpreting objective 8. Active transform fault processes, and what it implied for the siting of a vertical hole. This too requires further thought, and ideally some input from the Tectonics Panel.

4.5 In general other objectives were well-covered by one or more areas, although, on the basis of present knowledge, the prospects of drilling an upper mantle section in the Pacific are poor. This reflects the well-known fact that very little ultramafic material has ever been recovered from crust formed at fast spreading ridges.

4.6 Accumulated scores for the areas ranged from 10 to 32, but the distribution was bimodal; six areas had scores ranging from 27 to 32, and 5, 6 or 7 '3' ratings; the remaining areas had scores ranging from 10 to 21, and 3 or fewer '3' ratings.

4.7 The next stage therefore was to construct a short-list of the six most promising areas and to see how well these covered the objectives identified under 4.1.

5.0 <u>Construction of a short-list of target areas</u>

5.1 The six areas alluded to at 4.6 and 4.7 above were the transverse ridges associated with the Vema and Atlantis II fracture zones; the sites within the median valley of the mid-Atlantic ridge at MARK and 15° 20'N, and the fault blocks associated with rifting of pre-existing crust in the vicinity of Kings Trough and Hess Deep.

5.2 Most of the objectives are adequately covered by these six areas with two notable exceptions:

(i) five of the six areas are in crust formed at slow spreading ridges, pointing to the necessity to identify additional areas in the Pacific

(ii) crust formed in a plume-related setting is poorly represented.

5.3 In view of these deficiencies the Working Group identified six additional areas, for which it would seek further information, with the intention of adding perhaps three of them to the short list. These were the Pito and Endeavour Deeps, and the Siqueiros, Garrett, Blanco and Oceangrapher fracture zones.

5.4 A Group member was then assigned to each of the twelve potential target areas now under consideration. These 'watchdogs' were asked to collate information on the area, in consultation with other researchers, with a view to making a presentation at the Working Group's next meeting.

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5.5 There follows a listing of the 12 areas, the 'watchdogs' (underlined) and a partial listing of other researchers known to be involved in studying the area.

1. <u>Atlantis II. F.Z</u>. <u>Dick</u>, Natland, Bloomer, Robinson

2. <u>Vema F.Z</u>. <u>Mével</u>, Bonatti, Kastens

3. <u>15° 20'N</u>, <u>Dick</u>, Bougault, Dimitriev

4. <u>MARK</u>. <u>Mével</u>, Juteau, Karson, Dick, Casey

5. <u>Kings Trough</u>. <u>Cann</u>, Zonenshain, Klitgord, Casey

6. <u>Hess Deep</u>. <u>Natland</u>, Dick, Francheteau, Gillis, Lonsdale, Karson

7. <u>Pito Deep</u>. <u>Taylor</u>, Martinez, Hey, Francheteau, Naa, Stoffer, Searle

8. <u>Endeavour Deep</u>. <u>Phipps-Morgan</u>, Kleinrock, Larson

9. <u>Garrett F.Z</u>. <u>Fox</u>, Mével, Cannat, Hekinian

10. <u>Siqueiros F.Z</u>. <u>Casey</u>, Fornari, Kastens, Perfit

11. <u>Blanco F.Z</u>. <u>Robinson</u>, Mével, Juteau, Delaney, Karsten, Emberley

12. <u>Oceanographer F.Z</u>. <u>Fox</u>, Dick, Casey

6.0 <u>Phase 1 of an Offset-Drilling program</u>

In making this global review of potential target areas for offset drilling the Working Group identified six areas in which drill sites could be proposed on the basis of existing survey information. Additional site surveys would be desirable, and in most cases these are scheduled for the near future. Four of these six areas are in the eastern central Pacific and the north Atlantic, areas in which the JOIDES-Resolution will be operating within the next few years.

6.1 Experience at site 735B and on the Troodos ophiolite of Cyprus suggests that drilling plutonic rocks is much easier than drilling extrusives. The Working Group feels strongly therefore that to maximise the chances of early successes, both in terms of the amount of drill core recovered and the number of new objectives addressed, the first drill holes designed to contribute to an offset-drilling program should be sited in gabbros or ultramafic rocks.

6.2 The six areas which might feature in Phase 1 of an offset drilling program are Hess Deep, MARK, 15° 20'N and the Vema, Atlantis II, and Blanco fracture zones. A brief outline of the principal objectives in each of these areas is given below:

1. <u>Hess Deep</u>
Drill site to be located on gabbro outcrop, on the flanks of an intra-rift horst. Primary objective is to drill a long section of gabbro, with the possibility of penetrating the Moho.

To the extent possible the original orientations and relationships must be recoverable. Ideally the relationship of each site to the regional structure, to other sites, and to the ridge that produced them should be obtainable. The completeness to which this can be achieved should be a major criterion for establishment of the individual lab areas.

The survey techniques that we anticipate will be necessary for this documentation of the proposed sites include, but are not necessarily limited to:

1. Near-bottom side-scan imaging of the region.

2. Submersible dives and sampling, including contact characterization, structural; attitudes of rocks and contacts, and any other appropriate features present[1]. We visualize a dive density of approximately one-kilometer spacing in the vicinity of the proposed sites.

3. Local subsurface information:
   - A. Near bottom magnetics
   - B. Near bottom gravity (only on-bottom exists at present) (These two could be part of the side-scan survey.)
   - C. Near bottom seismics (high resolution deep source, deep receiver seismic imaging to get at shallow crustal structure beneath proposed drill target.
   - D. Multichannel seismic-reflection profiling to determine regional structure and local internal structure to the extent possible. The multichannel seismics are useful more for regional structure than the local site characterization. They should be coordinated with refraction to improve the local velocity structure.

4. To the extent possible, a geologic map and accurate true-scale, balanced cross sections should be constructed, locating proposed sites in their structural contexts. The objectives of each site should be clear in the cross-section.

Once drilled we envision that vertical seismic profiling should be used better to place the drill section in a regional context.

We believe that these survey requirements are of a magnitude that requires greater resources and coordination than is the present practice. Possibly for each laboratory the planning should include the design of a survey program that will meet the requirements of the regional context and the establishment of drilling targets in as timely and cost-effective a manner as possible. Since each natural laboratory may entail $25 million of drilling, it would be prudent to commit up front around $2 million for the needed survey.

8.0 Technological requirements to implement the strategy

One of the great attractions of an offset drilling strategy is that it should not involve technological capabilities and developments beyond those which currently exist or are anticipated within the next few years. However, having said this, the routine provision of some of the developments currently in hand could be crucial to the degree of success achieved by an offset drilling program.

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[1] See suggested Tectonics Panel Check list, JOIDES Journal, V. XVII, No.2, June 1991, pp.58-59.

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2. MARK
Two 500m holes should be drilled, in gabbro and peridotite respectively, in what has been interpreted as the footwall of a median valley master fault. In addition to providing sections through Layer 3, the upper mantle, and possibly the transition zone between them, these holes would test the hypothesis of a 'master' or detachment fault by determining the nature and width of any deformation zone adjacent to the postulated fault.

3. 15° 20'N
Ideally three 500m holes should be drilled in both unaltered and hydrothermally altered ultramafic (presumed mantle) material in this geochemically 'enriched' area. The primary objective would be to elucidate the nature of the upper mantle and parental magmas in such an area. The first hole could be sited in hydrothermally altered and cemented breccias in the hanging wall of the media valley master fault. It should penetrate the fault within a short distance and then enter hydrothermally altered ultramafics in the footwall. The second and third holes should be sited in unaltered duhite and harzburgite outcrops respectively i.e. away from the hydrothermal system.

An intensive dive program is scheduled for this area within the coming eighteen months which should greatly assist the planning of this Leg.

4. Vema F.Z.
Two or three holes, perhaps 300-500m in length designed to penetrate the Layer 2/Layer 3 transition, and to elucidate the tectonic evolution of the transverse ridge.

5. Atlantis II F.Z.
The flat, hard rock platform of this transverse ridge, at relatively shallow depth and with all units outcropping, offers excellent prospects for 'stratigraphic' holes at virtually all levels. However the first objective would probably be to deepen hole 735B.

6. Blanco F.Z.
The Layer 2/Layer 3 transition is particularly well mapped in scarps flanking the Blanco trough making this an excellent prospect for multiple sections through this transition in crust formed at an intermediate spreading rate.

The Working Group resolved that the Chairman's executive summary of the meeting, which has been requested by the JOIDES office, should be submitted by 1 September, in the hope of influencing the planning of the North Atlantic Prospectus. One or two-page summaries of the drilling proposals for the MARK, 15° 20'N, and Vema fracture zone areas, to be prepared by Jack, Casey, Henry Dick and Catherine Mével, should also be submitted to the JOIDES office with a view to them being appended to the Chairman's summary.

7.0 Site Survey requirements for Offset Drilling Laboratories (original draft by Eldridge Moores, Jim Natland and Jason Phipps-Morgan)

The objectives of the proposed offset drilling laboratories are to obtain drill samples from major oceanic crustal transitions (layer 2/layer 3; layer 3/mantle{Moho}), as well as long composite sections between the transitions and in the mantle.

The following technological capabilities are considered to be particularly relevant to offset drilling:
- the Hard Rock Guide Base, ideally modified to cope with slopes up to 35°, and with an anchoring mechanism.
- the 'hard rock' Drill-in Casing, which might be invaluable, for example, on benches covered with up to 10 or 20m of talus.
- the hard rock spud-in with downhole Mud Motor and diamond impregnated bits
- a commandable on-off beacon with long battery life (e.g. 5 years), and deployable by ROV.
- the Electronic Multishot Orientation Tool

- in principle the Diamond Coring System should be very relevant to offset drilling but the group were concerned that core orientation and certain crucial down-hole measurements, such as the Formation Micro Scanner, might not be available because of the narrower hole. If this were to be the case then the downhole Mud Motor, producing a full-size hole, would be preferred, the group attaching great importance to obtaining oriented core and a full suite of downhole measurements.

9.0 Membership

The working group reviewed its membership, in the light of the full range of objectives and potential target areas it had identified, and considered the full membership to be entirely adequate and appropriate.

10.0 Dates/venues of further meetings

It was decided that two further meetings would be required to complete the group's remit. The first of these should be devoted almost entirely to detailed presentations on, and very thorough consideration of, each of the twelve potential target areas now identified. Four days should be allocated to this meeting. The second meeting would be devoted to finalising the group's report. The following venues and dates were suggested:

February 3-6 1992; Miami (Host: Jim Natland)
May 18-20 1992; Paris (Host: Catherine Mével)

11.0 Relevant proposals

The group requests that copies of all relevant proposals, including those more than three years old, be forwarded to all its members. Four proposals were copied to members of the Group prior to the meeting but of these one (343) was irrelevant, another (369), relating to the MARK area, was incomplete (only even pages had been copied), and the remaining two (376, 382) were for the Vema fracture zone. The Group understood that one or more proposals have been submitted for each of the following areas: Hess Deep, Atlantis II F.Z., the MARK area, and the Vema and Oceanographer fracture zones, and that there might well be others that are relevant to an offset drilling program.

Fred Vine
29 August 1991

000574

Meeting of JOIDES Sea-Level Working Group

Scripps Institute of Oceanography
La Jolla, California

November 4-6, 1991

RECEIVED
NOV 1 8 1991
Ans'd...........

Attending:

P. D. Crevello (Chairman, USA), D. Aissaoui (France), M.-P. Aubry (France), R. Carter (Australia), A. Droxler (USA), G. Eberli (Switzerland), R. Flood (USA), T. Loutit (USA), C. Kendall (USA), K. Miller (USA), G. Mountain (USA), W. Sager (USA), R. Tiedeman (Germany), J. Van Hinte (Netherlands), A. Watts (England), E. Winterer (USA)

Liaisons:

J. Watkins (USA), C. Fulthorpe (USA)

Regrets:

N. Christie-Blick (USA), P. Davies (Australia), R. Halley (USA)

Summary

1). The second meeting of the SL-WG was hosted by Jerry Winterer at Scripps Institute of Oceanography.

2). The SL-WG concurs that the scientific, technical, and international platform provided by JOI and the Joides Resolution is the only way to present a global and unified approach to study sea level issues.

3). The SL-WG recognizes the contributions of the JOI/USSAC El Paso workshop on sea level, but acknowledges the need for a position paper that will provide the state-of-knowledge of sea level issues, and that will serve as a reference of scientific and technologic guidelines for ODP review panels and for proponents of sea level proposals.

4). The SL-WG recognizes that important technological developments, for example core recovery, are needed to ensure successful recovery of rock material, which is critical for interpretations of sea level issues, and that supplemental drilling platforms and acquisition of land data will likley be necessary.

5). The SL-WG supports the proposal that stratigraphic data be documented for all drill sites regardless of the site objective, and that centralized computer storage of stratigraphic data should be provided to permanently store and facilitate access to stratigraphic data..

6). The objective of the La Jolla meeting was to finalize the organization, content, and contributions to the position paper: this goal was met. After keynote presentations on Monday morning, the SL-WG split into four topic groups and finalized respective outline drafts and initiated writing preliminary texts. The four primary areas of investigation to be deemed important sea level issues follow the outline established at the Littleton SL-WG meeting (March 2-3, 1991); these include:

a. Synchronic or determining timing of stratigraphic events.
b. The stratigraphic record as a response to eustatic sea level changes.
c. Estimating magnitudes and rates of change of sea level changes.
d. Mechanisms of relative sea level change.

7). Two guest speakers, Michelle Kominz and Mike Steckler, presented topics that dealt with stratigraphic response to sea level mechanisms. Both topics provided important points for discussions and contributed to drafts of the final outline of the position paper. Kominz presented large-scale long-term mechanisms for sea level change, and Steckler demonstrated by stratigraphic modeling of sequence-scale depositional margins the variable influence of tectonics, sediment flux, and sea level on the timing of sequence boundaries, and development and distribution of systems tracts.

8). Craig Fulthorpe presented current ODP proposals that address various aspects of sea level issues. Crevello requested this presentation so that SL-WG members were familiar with current sea level proposals, realizing that the SL-WG does not have authority to discuss the merits nor vote on proposals. Fulthorpe also presented some general philosophical background which led to the initiation of the SL-WG (Attachment 1).

9). Tuesday morning group leaders presented updates of issues, strategies, etc. to the SL-WG and opened the floor for comments and additions to their respective outlines. After a short field trip on Tuesday afternoon, the subgroups initiated drafts of preliminary texts the topics listed in item 6.

10). The SL-WG agreed that in addition to the text each section will be complete with figures and references which address:

a. State-of-knowledge for scientific issues,
b. Technical issues,
c. Strategy, and

d. Criteria for proposals.

11). Drafts for each topic section will be completed by the subgroups by March 15, 1992, and these drafts will be distributed to the SL-WG members for review and comments. Review and discussion of the topic drafts and merging of the drafts into a final report will be initiated at the third and final meeting of the SL-WG. The final draft of the position paper will be completed by August, 1991. The final paper will be written such that periodic updates of evolving techniques or new issues can be addended to the text, thus prolonging the utility of the position paper.

12). The final SL-WG will focus on several aspects:

a). Review drafts and finalize the position paper.
b). Review the worldwide potential of sea level sites not already proposed to ODP and recommend priority areas.
c). Discuss short-term versus long-term goals of the SL-WG and provide recommendations to ODP, which includes foreseen evolving and unpredicted scientific and technical issues, in addition to maintaining longevity or continuity of the SL-WG position paper and recommendations.
d). The venue for the next meeting will be chosen based on its proximity to a nearby example of an exceptional outcrop and subsurface (i.e., industry) data set, which the SL-WG will undertake in a group workshop approach to demonstrate the application of strategies defined by the position paper.

13). The date for the next SL-WG meeting was discussed and it was agreed to by a majority of SL-WG members that the next meeting will have to take place between June 1-15, 1992. This narrow window is dictated by committee members previous commitments. Three venues were proposed that satisfy the workshop objectives listed in Item 9b, with The Isle of Wight and the Vercors recommended as best locations for achieving the workshop objectives. Venues nominated for the next meeting include:

a). Oxford or South Hampton, England, hosted by T. Watts, Isle of Wight, for Cretaceous-Paleocene;
b). Grenoble, Paris, or Pau, France (invited by Peter Homewood to use Elf Aquitaine's facilities), for Upper Cretaceous-Eocene of Pyrennes, Jurassic or Upper Cretaceous-Paleogene of Paris Basin, or Cretaceous of Vercors, French Alps.
c). Alabama, for Tertiary of the U.S. Gulf Coast.

000578

ATTACHMENT 1

Sea Level Working Group (SL-WG)

- Following the El Paso JOI/USSAC Workshop, it was the perception of the ocean-drilling community that further thought must be given to strategies for sea-level studies: SL-WG was created.

General Philosophy

- SL-WG is representative of the entire JOIDES membership (US and international). Its report will **supersede and replace** that of the El Paso JOI/USSAC Workshop (a purely US document). SL-WG report must, therefore, re-evaluate the strategies described in the El Paso document and endorse or modify them.
- SL-WG should consider the **scientific justification and general strategies** for the use of ocean drilling for sea-level studies.
- SL-WG should emphasize generic geological settings, rather than specific geographical locations. The latter are chosen by proponents and their prioritization or ranking is the prerogative of the thematic panels.
- The SL-WG report must **assist thematic panels** to review and rank sea-level proposals. It must also **provide general guidance to future proponents** in writing proposals aimed at sea-level objectives.

Note:

- The SL-WG report **might** also include an advertisement for publication in the *JOIDES Journal* soliciting proposals and providing guidelines to proponents.
- Specific proposals should **not** be ranked by SL-WG, or mentioned in its final report. (SL-WG is a Working Group, not a Detailed Planning Group.)

Future Meetings

- SL-WG should preferably meet only once more.
- The third meeting should be in February or early March, 1991, because the final report will feed into the 21-23 April, 1991, PCOM meeting.

P. 5

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000579

OCEAN DRILLING PROGRAM

5 September, 1991

Dr. Susan Humphris
Chair, ODP Lithosphere Panel
Department of Chemistry
Woods Hole Oceanographic Institution
Woods Hole, MA 02543

Dr. Judith McKenzie
Chair, ODP Sedimentary and Geochemical Processes Panel
Geologisches Institut
ETH-Zentrum
Sonneggstrasse 5
CH-8092 Zürich, SWITZERLAND

Dr. Eldridge Moores
Chair, ODP Tectonics Panel
Geology Department
University of California
Davis, CA 95616

Dr. Nicholas Shackleton
Chair, Ocean History Panel
Godwin Laboratory for Quaternary Research
Cambridge University
Free School Lane
Cambridge CB2 3RS, UNITED KINGDOM

Dear Thematic Panel Chairs:

At its recent meeting in Hannover, PCOM discussed the issue of Supplemental Science in great detail (as advertised in the Agenda Book, copies of which you have). A number of actions came out of that discussion, which I thought it necessary to bring to your attention in advance of sending out full draft minutes of the meeting, which should be available within the next two weeks. The two motions and consensus listed require some action/consideration on the part of thematic panels at their fall meetings, as I will detail below.

Motion

Upon evaluation of the three supplemental science proposals we have received, PCOM ranks the potential science return of S-3 (OSN-2) the highest. Therefore, PCOM will consider only S-3 for scheduling in FY92.

Consensus

In order to decide at the Annual Meeting whether to reserve a maximum of 10 days during Leg 145 for drilling a re-entry hole, OSN-2, paired with NW-1A (Supplemental Science Proposal S-3), we ask the thematic panels and co-chiefs for Leg 145 to determine which sites would be modified or dropped to accommodate up to 10 days at OSN-2.

ACTION: PCOM will decide in December whether or not to schedule OSN-2 based upon input from the thematic panels, in particular OHP, which is taking the lead role in planning the leg. If PCOM schedules up to 10 days of drilling/casing operations in support of the Ocean Seismic Network, what can/should be dropped from the existing prospectus? A deep basement hole at Detroit Seamount? Basement penetration in the Patton-Murray Seamounts? Remember, Leg 145 cannot be lengthened to accommodate OSN operations, so potential OSN activity amounts to a reduction of approximately 20% of on-site time for Leg 145. Attention LITHP and TECP - OSN-2 activity probably means eliminating all basement/plate kinematic objectives from that leg!

Motion

PCOM moves that the supplemental science proposal S-2 (to log Hole 801C) be incorporated in the prospectus of legs 143/144 (Atolls and Guyots) as an alternate site, and that the appointed co-chief scientists consider the logging at Hole 801C, which has a considerable scientific merit as recognized by the thematic panels and by PCOM, if time is available.

ACTION: Despite the thematic panel support which logging Hole 801C got, particularly from TECP and LITHP, PCOM decided that it could not move A&G science aside to accommodate 3-days of 801C operations without additional input from the thematic panels and designated A&G co-chiefs. Hence its "alternate" status. Following the August meeting, Roger Larson, proponent for S-2, asked me if he could "lobby" the thematic panels/co-chiefs for additional support. I enclose two letters from him in this connection. I also enclose the communication from Dave Rea, chair of the A&G-DPG, detailing the DPG's choice for deletion, if logging 801C were to be put on the Leg 144 schedule (i.e., basement penetration at LoEn, below pelagic cap site Pel-3). Should logging at 801C supplant some part of the DPG-mandated A&G science? If so, which part? (In other words, do you agree with the DPG's assessment?) For your information, I have asked the four A&G designated co-chiefs (143: Winterer/Sager [not directly affected by this situation]; 144: Haggerty/Premoli-Silva [directly affected, because logging 801C would have to take place on this leg, for logistics reasons]) to give me their point of view, which I will pass on to you as soon as I get it (probably mid-September). PCOM's motion (above) on logging 801C during Leg 144 will stand unless strong statements from thematic panels/co-chiefs urging a change from its "alternate" status arrive before/at the Annual Meeting.

I apologize for further crowding your already crowded fall agendas, but I simply have no choice in these matters, in order to be fair to all concerned. You may want to know that this is a one-time situation, as PCOM also moved to abolish "supplemental" science at its August meeting (details to come in the minutes). Thank you all again for your continuing, diligent efforts on behalf of the Ocean Drilling Program.

Sincerely,

Jamie

James A. Austin, Jr.
Senior Research Scientist
Chair, JOIDES Planning Committee

JAA/km

cc: T. Pyle
B. Malfait
T. Francis
X. Golovchenko
R. Larson
D. Rea
P. Worthington
Leg 143 co-chiefs
Leg 144 co-chiefs

000582

The University of Michigan

DEPARTMENT OF GEOLOGICAL SCIENCES

1006 C. C. LITTLE BUILDING
ANN ARBOR, MICHIGAN 48109-1063

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MEMORANDUM

To: Atolls and Guyots DPG
(F. Duennebier, R. Halley, M. McNutt, H. Staudigel, E. Winterer)

From: David Rea

Re: April PCOM meeting

Date: April 26, 1991

I presented the results of our DPG effort to the Planning Committee on April 23rd. The report was accepted as presented and our legs A and B will be scheduled as Legs 143 and 144.

At our urging, and that of others, Tim Francis at ODP/TAMU investigated the facilities available at Majuro for the intermediate port call and found them to be (marginally) adequate. So the exciting news is that both Majuro and Yokohama are on as ports and the cruises can go essentially as planned; the most recent iteration of the ship schedule is attached. The JOIDES Journal will publish an expanded version of the DPG minutes in the June issue.

There is a possibility that Roger Larson's add-on request to log Site 801 will be granted. The three or so days alotted to that effort would, according to the priorities we established, come from the time scheduled for deeper penetration into the guyot LoEn, below the pelagic cap site Pel-3. The pelagic section at Pel-3 would remain on the schedule as in the original proposal. PCOM will consider the add-on requests in August.

xc: J.A. Austin
T.J.G Francis
N.J. Shackleton

The Univers. , of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

000584

August 29, 1991

Dr. Isabella Premoli-Silva
Dipartimento di Scienze della Terra
Universita di Milano
Via Mangiangalii 34
20133 Milano, ITALY

Prof. Janet A. Haggerty
Research Office
University of Tulsa
600 South College Avenue
Tulsa, OK 74104

RECEIVED
SEP 0 3 1991
Ans'd.........

Dear Isabella and Janet:

As you probably know by now, PCOM did not place my return to log ODP 801C proposal on the primary ODP Leg 144 schedule but left it "alive" as an alternate. Although I was not at the meeting, I believe that to a great extent this happened for other than purely scientific reasons. Thus, I am still of the opinion that logging the world's oldest oceanic crust at ODP 801C is more important than 3.5 days of basement drilling somewhere on ODP 144. The recommendation of the Atolls and Guyots working group that 3.5 days of basement drilling at Lo-En Guyot in the Marshals is the lowest priority item on the ODP 144 basement program seems a reasonable one to me, although it might also be interesting to ask the opinion of the combined TECP/LITHP meeting in October 1991. I know that you are committed to the Atolls and Guyots program but would hope that you have the breadth of scope to agree with me that passing within 60 miles of an open, cased hole at the bottom of which lies the world's oldest oceanic crust that has not been logged, and not stopping to log it properly would constitute the loss of a golden opportunity to the scientific community in general. As stratigraphers, I am sure that you are aware of the usefulness of "type sections." These 801C logging results could be used with the recovered rocks to devise a reference or type section of completely evolved oceanic crust against which other drilled sites could be compared. No one has been able to explain to me what there is of potential greater importance to be learned by drilling basement for an extra 3.5 days at, say, Lo En Guyot. If you have such arguments, I would like to hear them.

While I shall continue to lobby as above for the logging of Jurassic basement at ODP 801C, I am really interested in participating in Leg 144, even if 801C is not logged. As you know I have great interests in Cretaceous mid-plate volcanism that constitute all of the other targets of ODP 144. I believe that logging will be critical to interpreting your results because your biggest potential problem is low recovery. I would like to be part of that logging program. I understand that the main competition for this slot is between myself and Jim Ogg, who is an excellent scientist of a somewhat different bent than me. Thus, I would think that the best solution for your program would be to take both of us if space is available and TAMU/ODP can be convinced of the potential benefit to the program. Jim was with me on ODP 129, and I am sure that we could work well together and would learn a lot from each other.

However, all of this comes out, I thank you for your consideration in these matters.

Sincerely yours,

Roger

Roger L. Larson
Professor of Marine Geophysics

cc: Jamie Austin, PCOM Chairman
Audrey Meyer, ODP/TAMU

UNIVERSITY OF CALIFORNIA, SAN DIEGO

UCSD

000585

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SANTA BARBARA • SANTA CRUZ

SCRIPPS INSTITUTION OF OCEANOGRAPHY
GEOLOGICAL RESEARCH DIVISION

9500 GILMAN DRIVE
LA JOLLA, CALIFORNIA 92093

September 9, 1991

RECEIVED
SEP 16 1991
Ans'd..........

Dr. James A. Austin, Jr.
Institute for Geophysics
University of Texas at Austin
8701 North Mopac Blvd.
Austin, TX 78759-8345

Dear Jamie:

I have been in touch with the other co-chiefs for legs 143 and 144 about the question of logging at Site 801C. Because the four of us are scheduled for a pre-cruise meeting at ODP on October 28 and 29, and since PCOM won't be meeting until after that date, we will go through the whole matter in some detail in College Station. As matters now stand, as we see them, PCOM has put 801C as an alternate site, and if this status is stable, then we are OK until then. We are none of us trying in any way to oppose 801C as an alternate: it may very well work out logistically that 801C could be done during Leg 144 with no sacrifice of the guyot objectives of the leg. If, on the other hand, between now and October 28, Roger Larson lobbies some panels into placing this task <u>above</u> the high-priority science on Leg 144, we would like to be informed, so that we can respond to the actual situation in an informed and timely way.

Janet Haggerty is the logical point of contact on this matter. She and Isabella are the people that would be most directly concerned with the operational plan for Leg 144. I'll be out of the country from September 17 through October 16.

Best regards.

Jerry

Edward L. Winterer

copy: J. Haggerty
I. Premoli-Silva
W. Sager

000586

Texas A&M University
Department of Oceanography
College Station, Texas 77843-3146

RECEIVED
SEP 11 1991
Ans'd..........

William W. Sager
Associate Professor
Phone (409) 845-9828

Internet "Sager@triton.tamu.edu"
Bitnet "Sager@tamvxocn"
FAX (409) 845-6331

September 9, 1991

Dr. Jamie Austin
Chair, PCOM
University of Texas at Austin
Institute for Geophysics
8701 Mopac Blvd
Austin, TX 78759

Dear Jamie:

In the recent maelstrom of FAXes and letters concerning proposal S-2, the logging of Hole 801C, I have remained an interested, albeit detached, observer waiting to see if one side or the other could marshal arguments that would win me over. I like to think that I approached the subject with an open mind with no preconceived agenda. With your FAX of September 5, calling for Leg 143/144 co-chief input, it appears that I must now declare myself Montague or Capulet. I am sending you this letter and copying it to the other Leg 143/144 co-chiefs as well as the appropriate people at ODP.

To begin with, I must say that I am often at the edge of the information loop and so my opinions may suffer from ignorance. For example, I have never seen proposal S-2, so I do not know what scientific arguments Larson musters in support of logging 801C. One major argument seems to be that the Jurassic oceanic crust at 801C is unique and that logging is needed to make a type section. I have not yet seen arguments that would make me think that logs from about 130 m of Jurassic basalt would be useful as a type section. The Jurassic crust does not seem to be all that different, there is not much of it drilled, and I am not sure with what it will be compared. I would be tempted to dismiss these reservations as uninformed, but PCOM and one of the Leg 129 co-chiefs are apparently in agreement. Thus, if it were my choice, I would not opt for S-2 over other science.

Hole 801C logging is being considered for Leg 144 because this leg passes near the site. Larson suggested that 3.5 days of basement drilling be scrapped at Lo-en guyot to gain the time needed. First of all, I do not think that basement drilling was planned at Lo-en. More to the point, only one deep basement penetration is planned for each leg. Each is very important because it will provide the best opportunity to determine a paleomagnetic pole for the Pacific plate from basalts (current plans call for a RCB orientation tool that may provide declination as well as paleolatitude). Deep basement penetration is needed to sample enough flow units to average out secular variation. The pre-Mid Cretaceous tectonics of the Pacific plate are not well known and there are few paleomagnetic data to help. Thus, I do not think that basement drilling should be dropped in favor of logging 801C. Another potential casualty of 801C logging is an engineering test of drilling in shallow water on Enewetak Atoll. This test is important because it is a necessary step in getting ODP into drilling shallow water targets. Furthermore, having 801C as an alternate site may mean dropping Seiko Guyot from the plans. This is because the logistics dictate that Seiko must be the last target for the leg. Any delay at 801C would bump Seiko off the end of the program. Seiko is an important drilling target because it is the only one of the Japanese guyots to be drilled. This group appears significantly different from the Marshall Islands and Mid-Pacific Mountains guyots which make up most of the drilling targets.

Lastly, the letter from Tom Pyle at JOI was surprizing to me. It was my impression that drilling plans were made from a consensus of scientific opinions supplied by the mulitnational committee structure as filtered and interpreted by PCOM. Though PCOM sometimes seems to yield a nonlinear response, it is ultimately one of the greatest strengths of the ODP precisely because its decisions are perceived as a consensus. I hope that JOI does not decide to override PCOM's decisions, for if it does, then I fear that the program's credibility may be lost.

Sincerely,

Will

William W. Sager

cc: Jerry Winterer
Janet Haggerty
Isabella Premoli-Silva
Audrey Meyer
Tim Francis

The University of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

000588

September 5 1991

RECEIVED
SEP 0 9 1991
Ans'd...........

Dr. James A. Austin, PCOM Chairman
Institute for Geophysics
University of Texas at Austin
8701 Mopac Boulevard
Austin, TX 78759-8345

Dear Jamie:

I write to request that you pass the following material onto Judy McKenzie, SGPP Chairman.

(duplicate sent to Humphris, Moores)

Dear Judy:

I write to report that PCOM did not place the logging of Hole 801C on the primary program for ODP 144, but left it as an alternate to be done if time permits. Despite extensive discussion of the issue, my impression is that this decision was made to some extent for something other than scientific reasons, and it also appears that their scientific reasons are flawed with misinformation as I shall describe below. Thus, I continue to believe that logging Jurassic basement is more important than 3.5 days of basement drilling somewhere else on Leg 144. Specifically, I believe that logging basement in the only known Jurassic location in the Pacific Ocean is more important than 3.5 days of drilling into yet another Cretaceous guyot. I do not believe that this question has been addressed by PCOM and I would like you to address it at your upcoming meeting in November in Zurich. If you agree with me that there is some aspect of basement drilling on Leg 144 that should be sacrificed so that the 801C logging can be accomplished, then I further believe that you should convey that opinion to PCOM as a panel resolution. Without your help in this matter, I fear that the drillship will pass within 60 miles of an open, cased hole into the world's oldest oceanic crust that has **not** been logged, and **not** stop to log it properly. I believe that logging 801C is an opportunity to characterize a "type locality" end member of fast-spread oceanic crust where the hydrogeology has evolved "to completion." It would be a great loss to the scientific community in general if this were not done.

While the Atolls and Guyots Working Group did not address the above question of the priority of logging 801C versus other basement drilling on Leg 144, they did prioritize the basement objectives internally. The result of that discussion was that 3.5 days of additional basement drilling into Lo En Guyot in the northern Marshalls was the lowest priority basement objective for Leg 144, and should be sacrificed if logging 801C were placed on the primary schedule (see enclosure). This seems reasonable to me, but I am sure that PCOM would also value your advice in this matter.

The stated scientific reasons for PCOM not putting 801C on the primary Leg 144 drilling schedule are contained in a copy of a letter that I received today from Jamie Austin, PCOM Chairman to Tom Pyle, Director of ODP/JOI in which Jamie asserts that (and I quote):

..."logging at 801C did not merit the #1 spot on PCOM's list primarily for scientific reasons (the minimal depth of basement penetration at that site, the fact that part of the basement section has already been logged, and PCOM's perception that the best course of action was for the proponent to put a new proposal into the system for both deepening and logging the hole). The co-chief of Leg 129 (Lancelot) supported this point of view, and frankly he is in a better position than you are to judge the science discussed."

My response is that first, regarding depth of basement penetration, we penetrated 131m into middle Jurassic basement at 801C, which is 131m more than anyone else has ever been able to do. DMP was appalled that we did not stop to log when we were only 100m into basement because of the unique nature of the hole. We did not log at that point during Leg 129 because our logging cable was spliced. The Schlumberger engineer strongly recommended against logging for fear of cable breakage at the splice and subsequent tool/cable loss as junk in the hole. Second, It is **not true** that the basement section at 801C has been partially logged. A quick perusal of Leg 129's Volume A would have informed PCOM that the top of basement in hole 801B (where we logged the sedimentary section) is at 460.6 mbsf, while logging extended down only to 458 mbsf, and logging "units" are not described below 448 mbsf. Third, the suggestion that I should put a new proposal into the system to both deepen and log the hole seems to indicate that PCOM's corporate memory is even worse than usual. On 12 February 1990 the JOIDES office acknowledged receipt of proposal 368E from me and four co-proposers to do exactly that, deepen 801C to 1000m and then log it. This proposal has fared above average in panel reviews (#11 by LITHP and #13 by SGPP as listed in the June 1991 JOIDES Journal), but not well enough to get onto the drilling schedule. Thus, Yves Lancelot's suggestion to deepen the hole and then log it has already been proposed and effectively rejected by the panel structure. I believe that logging the existing hole is a separate issue from deepening the hole to 1000m and then logging. While the worth of investing an entire leg in deepening the hole and then logging seems to be debatable, there is **no question** in my mind that it is worthwhile to invest a mere 3.5 days in logging the existing hole.

I thank you for your time and consideration in this matter, and hopefully, for your support.

Sincerely,

Roger

Roger L. Larson
Professor of Marine Geophysics

RLL:cs
Encl.

000590

P.S.

Jamie:

On reviewing my 801C correspondence, I realized that the SGPP also rated our original proposal highly (#368E to deepen 801C to 1000m and then to log it, as reported to me in Peter Blum's letter of 9 May 1991). They would presumably be interested in my current efforts to place our proposal to simply log the existing hole on the primary Leg 144 program. Thus, I would like to request that you also pass this correspondence onto them for their consideration at their November 1991 meeting in Zurich.

Many thanks for your efforts in what is proving to be more discussion about less rig floor time than has ever been experienced in scientific ocean drilling.

Roger

RL

The University of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

000591

October 22, 1991

Dr. Isabella Premoli-Silva
Dr. Janet Haggerty
Dr. Jerry Winterer
Dr. Will Sager

RECEIVED
OCT 29 1991
Ans'd............

Dear Isabella, Janet, Jerry, and Will:

I am sorry that I continue to be the "fly in the soup" of your guyot drilling program, but I continue to believe that logging Hole 801C is an important goal for ODP in general, and that specifically, it is worth 3.5 days of time on Leg 144 to accomplish that goal. In addition, I hope to be able to contribute to Leg 144 in the acquisition and interpretation of logging results on the guyots themselves. I also have some ideas for re-analysis of guyot bathymetry that might give us some more insight into the overall tectonics of the mid-Cretaceous volcanic episode. These are the sorts of ideas that I think would interest Jerry in particular, so we could talk about them separately at a later date. They might form part of the basis for a joint study of the tectonics of the mid-Cretaceous volcanic episode, especially if the Leg 143/144 results are published as a joint volume.

Regarding our hopes for logging Hole 801C, let me emphasize that our main thrust is to decipher the relationships between the hydrogeology, composition, structure and physical properties of the ocean crust at 801C. This has never been done for old ocean crust created at fast spreading rates, so we hope to start a program here that can eventually be generalized to all Pacific Ocean crust and much Indian Ocean crust older than about 30 Ma, in other words something like 25% of the surface of the planet! Obviously this is a big job that won't end with Hole 801C, but we have to start somewhere, and 801C seems to be an ideal "end member." In addition to the above general goal, we hope to make the first reliable stress measurement in the old part of the Pacific plate interior. No other such measurements exist for thousands of kilometers. Finally the recovered section at 801C suggests at least five reversals of magnetic polarity in the 801C basement section, supporting the possibility that the Jurassic magnetic "quiet zone" results from *very frequent* reversals instead of no reversals at all. The likely availability of the Japanese downhole magnetometer should give us a much better view of the reversal stratigraphy of 801C than our discontinuous samples.

I would also like to emphasize that, although there are no guaranteed results ahead of time in scientific ocean drilling, logging 801C may be the easiest thing to do operationally on Leg 144. As guyot drilling experts, I am sure you are aware of the potential pitfalls there, so I won't reiterate them. I shall, however point out again that it should not be difficult or time consuming to log the basement section of a hole drilled into 170 Ma-old ocean crust where the sedimentary section is completely cased off and the casing is cemented into the top of basement.

In summary, the cost of logging 801C is small and predictable. The result is less predictable, but potentially very large. I thank you again for your time and consideration of this matter.

Sincerely yours,

Roger

Roger L. Larson
Professor of Marine Geophysics

RLL:cs
cc: J. Austin, PCOM Chairman

000592

RECEIVED
NOV 1 8 1991
Ans'd...........

THE UNIVERSITY OF TULSA
College of Engineering and Applied Sciences
Department of Geosciences

TO: James A. Austin, Chair of JOIDES Planning Committee

FROM: J.A. Haggerty and I. Premoli-Silva, Co-chiefs of Leg 144 JAH + I.P.S.

DATE: November 15, 1991

SUBJECT: Changes in Leg 144 drilling prospectus and logging at Hole 801C

As a result of the pre-cruise Leg 143/144 meeting of the co-chiefs with ODP engineers and an LDGO logging expert, the scientific plans proposed for Legs 143 and 144 by the Atolls and Guyots DPG were found to be too time-consuming, and thus parts of the scheduled drilling had to be abbreviated or eliminated entirely. Additionally, the impact of logging Hole 801C on the most basic scientific objectives of the Atolls and Guyots program was considered.

At the meeting, we carefully calculated the amount of time that would be needed in order to complete the objectives and sites recommended by the A&G-DPG. It was found for Leg 144 that 79.8 days of ship time were necessary to complete the proposed science, but only 56 days are scheduled for this leg. A similar scaling-back of operations was necessary for Leg 143, to keep it within the time allotted for the leg.

Leg 144 was reduced to 56 days at the expense of three sites: Harrie-2, Sylvania-2A, Seiko-2. The key objectives that have been eliminated are the pelagic cap and lagoonal section at Harrie Guyot, the pelagic cap and more centrally located lagoonal limestones at Sylvania Guyot, as well as a reef crest site with underlying basement at Seiko Guyot. Moreover, the deep penetration of basement at MIT-1 has been reduced by 100 m (200 m penetration), and double-APC coring of the pelagic cap at Harrie and Sylvania Guyots were dropped. The only APC cores to be recovered from pelagic cap on Leg 144 will be at Pel-3 provided there is sufficient time. The 23-day discrepancy was the result of an under-estimate of the time necessary for deployment of mini hard rock guidebases and a slight under-estimate of drilling time in the carbonate sections.

The reduction in the number of drill sites will result in a single drill site per guyot with the exception of Sylvania. One drill site per guyot limits the drilling to lagoonal and/or backreef sections, preventing a reliable reconstruction of sealevel fluctuations.

We recommend that Sylvania-4, a reef crest/relic carbonate island or forereef site, be incorporated into the drilling strategy on Sylvania in order to recover the objectives pertaining to sealevel changes. Sylvania was originally scheduled for a backreef/lagoonal site and a central lagoon site, but we concluded that redrilling the pelagic cap and lagoonal section would be a luxury that we could not afford when more critical data were needed. A seismic line from a 1990 cruise of the R/V Moana Wave (see enclosed copy), made available to us only within the last few weeks, revealed the existence of a double perimeter reef or a relic carbonate island and perimeter reef on the northeast side of Sylvania. As you will recall, Jamie, the Safety Panel

600 South College Avenue • Tulsa, Oklahoma 74104-3189 • (918) 631-2517

approved the option of our drilling Sylvania in a reef crest or forereef location; they had no problem with our drilling directly into the inner perimeter "reef crest" or forereef. You noted that this strategy needed to be presented to PCOM for approval and therefore we are requesting approval. In addition to the critical information on sealevel fluctuations, drilling Sylvania-4 would clarify the age of the reef or possibly reveal the presence of a relic carbonate island, similar to carbonate islands existing on modern atolls.

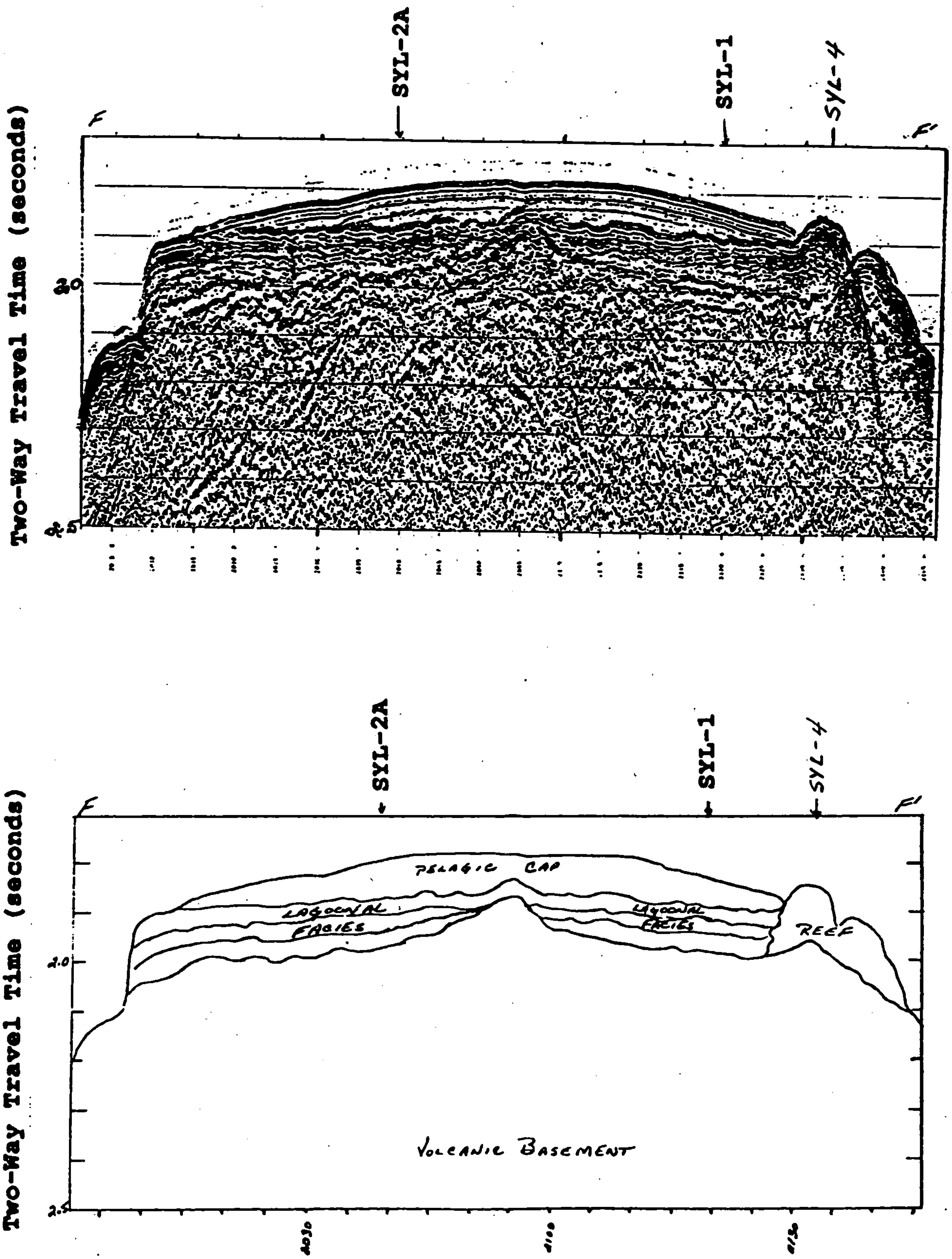
On the matter of logging at Hole 801C, an estimate of 3.3 days of logging and set-up time has been made by the Lamont BRG. In order to fit this supplemental science into the Leg 144 scientific plan, it will be necessary to drop one of the guyots endorsed by A&G-DPG from the drilling plan. As noted above, most guyots were targeted with two summit holes, one in the lagoon and one on the rim. Time constraints have already made it necessary to reduce most of these transects to a single hole. If the logging Hole 801C is changed from an alternate site (as presently designated by PCOM) to a priority drill site, another guyot drill site will have to be removed, causing a guyot to be passed by entirely.

We do not agree with the suggestion by Dave Rea of deleting Pel-3 from the scientific plan in exchange for logging Hole 801C. Lo-En Guyot, where Pel-3 is located, has one of the best pelagic caps for detailed studies; all other pelagic cap sites have been dropped because of time constraints. This guyot also has a distinctly different seismic profile than the other guyots; a carbonate platform or bank is present, but there is no apparent perimeter reef. Lo-En Guyot is on the same volcanic pedestal as its living sibling Anewetak (Enewetak). The USGS deep borehole data from Anewetak document the existence of an Eocene bank on top of the volcanic basement at approximately 1500 m sub-bottom depth. We should not miss this opportunity for comparing the results between the two siblings for enlightenment on the paradox of drowned reefs. Drilling through the pelagic cap and into the underlying carbonate platform is critical because these data can be correlated with the deep borehole data on Anewetak. No extensive "basement" drilling has ever been associated with the Pel-3 site, and therefore 3.5 days of "basement" drilling at Lo-En are not available for sacrificing as suggested by Roger Larson.

If logging at Hole 801C is required by PCOM and taking into consideration our scientific priorities and calculated time estimates, we propose dropping Seiko guyot from the drilling plan. Unfortunately, this is our highest latitude site and limits the breadth of the region that can be investigated. Moreover, this is our only site in the Japanese seamount province as well as the best site for paleomagnetic study. It is the only site were Albian reefs are believed to be developed. Of the 8 sites endorsed for Leg 144 by A&G-DPG, we only have 5 sites remaining; if logging at Hole 801C is required during Leg 144, time constraints limit us to 4 of the 8 sanctioned sites.

cc: Dr. Susan Humphris, Chair ODP Lithosphere Panel
Dr. Judith McKenzie, Chair ODP Sedimentary and Geochemical Processes Panel
Dr. Eldridge Moores, Chair ODP Tectonics Panel
Dr. Nicholas Shackleton, Chair ODP Ocean History Panel
Dr. Paul Worthington, ODP Downhole Measurements Panel

000594



Single-channel seismic reflection profile of Lo-En Guyot.

000595

October 16, 1991

Dr. Adam Dziewonski
Harvard University
Dept. of Earth & Planetary Sciences
20 Oxford Street
Cambridge, MA 02138

Dear Adam:

Revised Time Estimates for OSN-2 at Site NW-1

Our engineers have revised their time estimates for establishing a cased re-entry hole at Site NW-1 on Leg 145. Following our phone conversation, the plan now provides for drilling and casing a hole 15 m into basement, then drilling out the cement plug and shoe to provide 15 m of open casing in the basement. The latter step cannot be avoided if we are to guarantee a clean hole for the later deployment of your seismometer.

The time estimates work out as follows:

	Site NW-1B
Water Depth	5330 m
Sediment Thickness	300 m

	Hours
Jet-in soil test (done at an earlier hole)	2
Make up cone and 16" casing	4
Trip in	12
Jet in and release casing	3
Drill 300 m sediment (14-3/4" hole)	9
Drill 15 m basalt (14-3/4" hole)	4
Wiper trip, condition hole	4
Trip out	11
Make up 25 jts 11-3/4" casing	10
Trip in, reenter	12
Land, release, cement casing	5
Round trip/reentry with 9-7/8" bit	22
Drill out cement and shoe, flush hole	5
Trip out, secure	12
	115 (4.8 days)
Contingency time (1 round trip)	22
Total	137 (5.7 days)

Ocean Drilling Program
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Texas A&M University Research Park
1000 Discovery Drive
C Station, Texas 77845-9547 USA
(4.. .45-8480
Telex Number: 62760290
FAX Number: (409) 845-4857

We feel that it is necessary to add some contingency time to the 4.8-day estimate for the actual operations. Large swells are endemic in this region of the North Pacific and a chert zone was encountered at nearby Site 581 drilled on Legs 86 and 88. In fact, *Glomar Challenger*'s Leg 88 was a pretty disastrous affair, failing twice to establish a re-entry hole (see *Initial Reports DSDP*, Vol. 88, p. 9-11). *JOIDES Resolution* is a larger and more seaworthy vessel than *Glomar Challenger* and we feel that we can do a much better job. Nevertheless, the weather and chert could create a problem, so we have added in a contingency time of 22 hours (one round trip) to make a total estimate of 5.7 days.

As you know, the pilot hole for this site, NW-1A, will be drilled as part of the scheduled Leg 145 program. It is possible that the hole could be so unstable that attempting to set casing would be too risky. In that case, we assume that the attempt to create the reentry hole for OSN-2 would be abandoned.

It will now be up to the JOIDES Planning Committee to decide at its December meeting whether to include this work in the Leg 145 program.

Best regards,

Tim

Timothy J.G. Francis
Deputy Director

TJGF:hk

xc: Dr. James Austin, Chair JOIDES PCOM
Dr. Nick Shackleton, Chair JOIDES OHP
Dr. Ivan Basov, Leg 145 Co-Chief
Dr. Dave Rea, Leg 145 Co-Chief
Mr. Ron Grout, ODP Leg 145 Operations Superintendent
Dr. Tom Janecek, ODP Leg 145 Staff Scientist
Mr. Barry Harding, ODP
Dr. Audrey Meyer, ODP
Mr. Mike Storms, ODP

000597

Lamont-Doherty Geological Observatory of Columbia University | *Palisades, N.Y. 10964*

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Room 206
New Core Lab

October 3, 1991

Dr. James A. Austin
Chair, JOIDES Planning Committee
Institute for Geophysics
University of Texas
8701 Mopac Boulevard
Austin, Texas 78759-8345

RECEIVED
OCT 0 9 1991
Ans'd............

Dear Dr. Austin:

Having experienced first-hand over the past four years the emotional roller coaster one is placed on when shepherding a drilling proposal through the ODP "maze", I am writing you at another low point in my ride. This precipitous fall was brought about by PCOM's decision to tentatively include a 10-day drilling program as part of the Ocean Seismic Network into an already crowded cruise schedule. As your letter of 5 September to the Thematic Panel Chairs stated, this action by PCOM will mean the elimination from the existing Leg 145 prospectus of over 20% of the planned on-site operations.

During the past fifteen years much of my research has concentrated on resolving paleoceanographic problems utilizing North Pacific sediments. I assisted in the selection of sites for Pacific Leg 86, participated in the cruise, served as a co-proponent for Leg 145 sites, and have been invited to be a shipboard scientist on this leg. It is from this background that I wish to raise an objection to the "last-minute" inclusion of a program which will consume over 20% of Leg 145's scientific operations time. Although I can see the justification for accepting small supplemental science programs as add-ons, I have great difficulty considering this large a proposal as "supplemental".

As I am sure you are well aware, much good science has been already been trimmed from various North Pacific programs, first by CEPAC and then by OHP under expressed PCOM guidelines, so as to fit within the present Leg 145 61-day cruise limit. I am reminded of my roller coaster ride of several years past, when CEPAC personnel were diligently accessing submitted North Pacific and Bering Sea science programs. If the proponents of the Ocean Seismic Network had proposed their package during this time period, CEPAC may have been able to present PCOM with an even stronger North Pacific/Bering Sea proposal which could have conceivably justified two legs in this region. After all, the drill ship has not ventured into the Bering Sea since DSDP Leg 19. If the Ocean Seismic Network program is so important scientifically that it can circumvent the formal proposal review process established for extensive programs of its type, then PCOM should have the conviction to go to the international drilling community and state that it is necessary to keep the drill ship in the Pacific for another month or two to complete peer-reviewed, justifiably top-notch science.

I respectively await your reply.

Sincerely,

Joseph J. Morley

Joseph J. Morley

000598

cc: I. Basov
B. Bornhold
S. Humphris
L. Keigwin
J. McKenzie
E. Moores
J. Mutter
T. Pederson
D. Rea
C. Sancetta
D. Scholl
N. Shackleton

000599

The University of Michigan

DEPARTMENT OF GEOLOGICAL SCIENCES

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28 October, 1991

RECEIVED
OCT 30 1991
Ans'd............

Planning Committee
Ocean Drilling Program

Jamie

Dear ~~Planning Committee~~:

I am writing to encourage you decline the request to drill a seismometer hole at the location of Leg 145 proposed site NW-1A. The additional time now estimated for that operation, just less than 6 days, may place in serious jeopardy one or more of the objectives of the leg. The plans for Leg 145 were carefully crafted first by CEPAC and later by OHP, a process that involved those most knowledgeable about the sediments and history of the North Pacific Basin. The objectives are fundamental to deciphering the paleoceanographic record of the largest ocean and since I am concerned by suggestions that they may be routine in nature or not well thought out I offer this brief synopsis of the Leg 145 objectives.

Sites NW-1A and NW-4A are sited on locations where we expect to recover siliceous ooze overlying pelagic clays, overlying Cretaceous limestones. Basement ages at these two locations, necessary for accurate plate backtracking histories, are not well known and will be used to test tectonic reconstructions presented in the past several years by various authors. Of particular interest in these cores is the definition of the middle Miocene onset of significant silica deposition in the Pacific Ocean. The pelagic clays will provide an eolian record from which we can define the intensity of the zonal winds, a fundamental paleoclimatic record, and the aridity of the Asian source regions. These sites will enable much improved definition of important changes in atmospheric circulation at the Paleocene-Eocene boundary and associated with the late Cenozoic cooling of the northern hemisphere, as well as the first definition of atmospheric circulation changes at the Cretaceous-Tertiary boundary. These data can be related to the silica information to see if the silica shift corresponds to enhanced atmospheric, hence sea-surface, circulation. Alternatively, the addition of silica to the North Pacific may follow the development of important deep water sources in the North Atlantic forcing deep nutrient-rich waters to the North Pacific in the sense of present circulation. We look forward to obtaining much better dates on the pelagic clays than hitherto possible by measuring the strontium isotopes of the ichthyoliths and comparing the results to the strontium seawater curve. Pelagic clays are also the most faithful recorders of past ocean chemistry, and these sites will help define geochemical anomalies previously reported for the Paleocene-Eocene and Cretaceous-Tertiary boundaries. The basal limestones, likely of middle Cretaceous age, will provide paleoceanographic information of the northern sub-tropical Pacific at a time when the Pacific formed nearly all of the world's ocean.

Detroit Seamount and the Meiji Drift are the setting for a depth transect down the east slope of Detroit seamount between the summit location at a depth of 3.22 seconds (2415 meters) and the deep Meiji Drift site at 5.11 seconds (3833 meters). These and the one or two - depending on PCOM actions - intervening sites will provide a depth transect in this subarctic location. The depth transect is intended join those conducted in the Atlantic, Indian and equatorial Pacific Oceans to provide a more complete picture of the whole ocean circulation through at least the Neogene and, depending on recovery, portions of the Paleogene. Changes in carbonate dissolution, the age and nutrient concentration of deep waters, the history of North Pacific productivity, and the timing and nature of northern Pacific intermediate and deep water sources are important objectives. The sites should provide the highest resolution of any known North Pacific pelagic sites and a clear tie between the magnetic reversal stratigraphy and sub-polar biostratigraphies, thus providing the setting for numerous efforts that would benefit from such a good stratigraphy. These would include construction of a high-latitude biostratigraphic reference section, sub-Arctic paleoceanography, and studies of ice-rafted debris, eolian dust, tephrochronology, etc. The deep site is situated to penetrate the Meiji Drift, a large drift deposit that progrades south along the east side of the northern Emperor Seamounts. Recovery of these sediments will provide the first true definition of the flow of (at least) late Cenozoic bottom waters in the North Pacific, a record that we expect to be able to link to standard stratigraphies. This deep site lies on crust generated during the Cretaceous quite zone and so may contain a long record of north Pacific oceanic history. This region has been well surveyed by the U.S. Geological Survey *Farnella* cruises (Meiji Drift) and by the *Thomas Washington* Roundabout Leg 6 (1988) cruise (Detroit Seamount) so site selection and links to the regional geology are readily achieved. As an example of these geophysical data, the attached figure shows the proposed drillsite for the Detroit Summit Site, DS-1, where 0.44 seconds of sediment overly acoustic basement.

In February of 1985 the participants of the INPAC workshop held in Seattle suggested that the seamount platforms of the Gulf of Alaska should provide pelagic windows through the thick turbidite deposits and thus be important locations for paleoceanographic investigations. Ensuing surveys conducted by scientists from the Pacific Geoscience Centre and the University of British Columbia confirmed that these pelagic windows existed, and that the one with the most potential was located on the platform level of the Patton-Murray seamount group. Drillsite PM-1 at this well-surveyed location should allow generation of high resolution records of late Oligocene and younger oceanographic and climatic phenomena. The sediments should provide materials which link the carbonate-related, silica-related, and clastic-related events. Reversal, bio, and isotopic stratigraphies should be readily obtainable. A paleoclimatic record of particular importance that should occur at PM-1 is the ice rafting history which may reflect the growth and decay of the Cordilleran Ice Sheet, a history that may be distinctly different from that of the Larurentide Ice Sheet to the east. This site is intended to achieve for the Gulf of Alaska much of what the Detroit Seamount sites will for the far Northwest Pacific. It is unlikely, however, that these two locations will merely mirror one another since they are farther apart than the North Atlantic is wide (between Newfoundland and Spain). Any east-west asymmetries in either surface or deep water circulation should become apparent when comparing results from Patton-Murray Seamount to those from Detroit Seamount.

Currently Leg 145 has about 11 days planned for operations at NW-1A and NW-4A, 24 days for Detroit Seamount and vicinity, and 6.5 or 7 days for the work scheduled at Patton-Murray. Reassignment of 6 days to another objective will impact greatly on one or more of the above projects. Although I have not seen the minutes of the recent OHP meeting, my understanding is that they recommend abandoning the deep Mesozoic objectives in the vicinity of Detroit Seamount and the Meiji Drift if you insist on the seismometer emplacement hole. Further, only one intermediate-depth APC site could be cored at Detroit Seamount, rather than the two hoped for in the original plan.

In addition to this request to preserve all of the well-planned, fundamentally important science now scheduled for Leg 145, I want to address the broader topic of planning in general. The ODP planning structure is peopled by busy hard-working scientists knowledgeable in their various endeavors; who believe in the project and that their input can improve the overall science conducted. The final CEPAC prospectus was over six years in the making; we reviewed scores of proposals and selected the very best for presentation to PCOM. The downhole seismometry group had over two years after the first grand exposition of this idea at COSOD-II to present a cogent plan to CEPAC for consideration. Since that panel came up only a couple of weeks short of two strong legs in the Northern Pacific and Bering Sea, the timely submission of such a plan would have been welcomed. The present side-door approach, if successful, makes a mockery of those CEPAC efforts and of the last two years of OHP planning. Ask the proponents to prepare and submit an ODP drilling proposal in the normal fashion. If it is good science the appropriate panels will rank it highly and keep in on their lists for future drilling. If you permit drilling proposals (this is much more than an add-on proposal, a concept already put to rest) to avoid the planning structure a strong message of futility emanates from PCOM; geopolitics wins, geoscience looses.

Sincerely yours,

Dave

[redacted]

David K. Rea
Professor and
Leg 145 Co-Chief Scientist

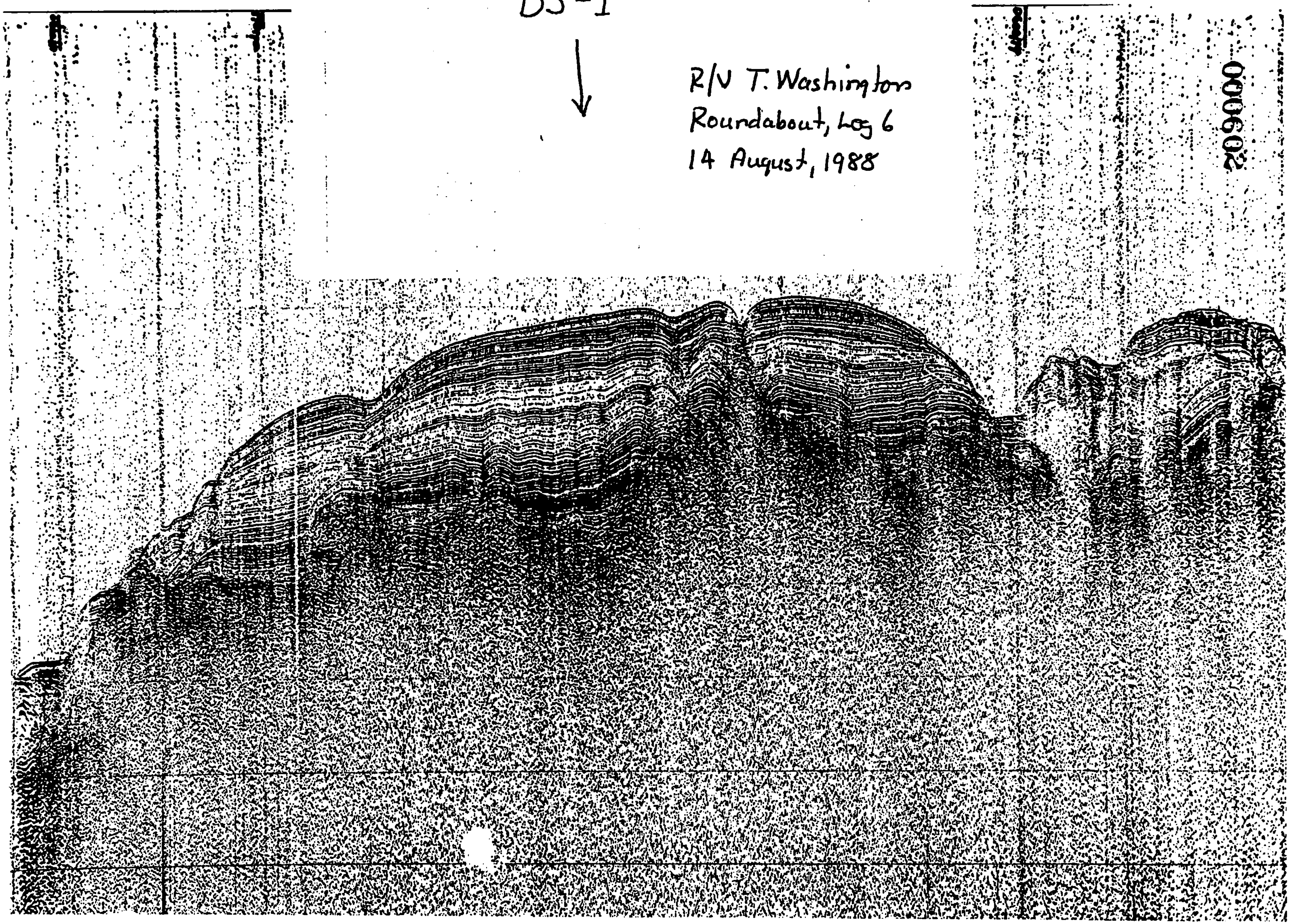
xc: Thematic Panel Chairs
Leg 145 Proponents
B.T. Malfait
T. Pyle

Jamie - Latest estimates from
A. Mayer & T. Janecek

onsite (memo 9/30)	46.0d
travel (memo 10/6)	17.8
Det-Smt inter site	.5
	64.3d

∴ we already have to trim several days as is.

-DR.



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United States Department of the Interior

U.S. Geological Survey
Branch of Pacific Marine Geology
345 Middlefield Rd. MS - 999
Menlo Park, California 94025

David W. Scholl
Telephone: (415) 354 3127
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RECEIVED
NOV 0 5 1991
Ans'd...........

October 31, 1991

Dr. James A. Austin
Chairman, JOIDES Planning Committee
Institute for Geophysics
University of Texas
8701 Mopac Blvd.
Austin, Texas
78759-8345

Dear Jamie:

This letter concerns Leg 145 and the proposed add-on drilling objective of the Ocean Seismic Network folks. I am writing now because time is getting short for me as I must soon join the Chile Triple Junction gang (Leg 141).

Back in the birthing days of the ODP cycle of JOIDES planning, I helped as a member of CEPAC to guide the Chile drilling proposal toward its acceptance by PCOM. I similarly devoted lots of effort to the framing of the scientific prospectus for the recently completed Lau-Tonga Leg (135). The same can be said for the north Pacific transect leg, for which I can be regarded as a co-proponent. So, I was really pleased when PCOM scheduled Leg 145 to address scientific objectives in this high north Pacific region.

I relate the above information as a way of explaining that in one capacity or another I have work diligently in support of the JOIDES planning process. As a consequence of these experiences, I believe I understand the procedures involved in planning leg science. So, I was both puzzled and troubled when I learned that PCOM is considering devoting perhaps as much as 20 percent of Leg 145's available on-site drilling time to accomplish an add-on science objective of the Ocean Seismic Network.

During my days on CEPAC, and as a liaison member to the Tectonic Panel, I can recall no proposal or related discussion concerning a north Pacific OSN objective. But I do vividly recall lengthy deliberations centering on the need for several drilling legs to carry out the most worthy of the scientific objectives submitted to JOIDES in the form of preliminary and mature drilling proposals. Although both a north Pacific transect and a Bering Sea leg were strongly recommended by CEPAC, only the north Pacific transect was endorsed by PCOM.

I don't need to emphasize that competition for ODP drilling time is intense, a circumstance that can spawn darn-right contentious debating in advisory panel meetings. As a consequence of this mulling process, the completed CEPAC drilling prospectus evolved into a thoroughly thought through planning document. Knowing this, it seemed to me that PCOM would not be considering forgoing achievement of 20 percent of the recommended high-latitude science unless the OSN proposal was of exceptional merit. Notwithstanding this recognition, I remain curious about how the OSN proposal would have fared in one-on-one competition for drilling time if it's virtue had been argued before the CEPAC and thematic panel members who guided the writing of the drilling prospectus.

I was disappointed that a Bering Sea Leg was not scheduled to round-out our understanding of the paleoceanographic history of the far north Pacific. Both surface and deep-water circulation patterns are importantly influenced by the exchange of north Pacific and Bering Sea waters. The paleoceanography of the north Pacific is in part conditioned by that of the Bering Sea, which in turn is strongly controlled by transpressive plate-margin tectonic processes that modulate Pacific-Bering circulation by opening and closing passes between blocks of Aleutian islands. The yin and yang of high latitude surface and deep-water paleoceanographic knowledge thus reside in drilling both south and north of the Aleutian Arc.

Although the OSN work is described as add-on science program, it is clearly a subtracting one insofar as achieving the scientific objectives outlined in the planning prospectus. Allowing that the OSN proposal is of exceptional caliber, can it not therefore be called upon to justify an expanded rather than a reduced high-latitude drilling effort? For example, should not the OSN drilling objective be coupled to those already described for the Bering Sea to flesh out a second high-latitude drilling leg?

I close here by expressing my thinking that if a second high-latitude leg is not presently doable, that the OSN work should be held in reserve to bolster a future effort of high Pacific-Bering Sea drilling. As it has been explained to me, I further believe that the OSN objective does not justify diminishing even a small fraction of the science program articulated in the CEPAC planning prospectus. A worthy add-on program, however, would be to schedule time to drill deeper into the igneous crust of Detroit Seamount for the purpose of verifying or challenging the presumed slow southward track of the Hawaii hotspot.

I would greatly appreciate your willingness to share this letter of concerns and suggestions with other members of the PCOM.

Cheers and best regards,

Dave

David W. Scholl

c/c

David Rea
Joe Morley
Lloyd Keigwin
Brian Bornhold

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000605

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4 November 1991

Dr. David Rea
Department of Geological Sciences
1006 C.C. Little Building
University of Michigan
Ann Arbor, MI 48109-1063

RECEIVED
NOV 0 6 1991
Ans'd............

Dear Dave:

Thanks for the copy of your 28 October 1991 letter to PCOM regarding Leg 145.

I don't want to get into the merits of current leg objectives versus a hole for the Ocean Seismic Network (OSN). I regret that the OSN proposal didn't come sooner since you pointed out that it would have been welcomed in drafting a two leg North Pacific/ Bering proposal.

My only reason for writing is to object to your characterizing the OSN proposal as a "side-door approach" and as perjorative "geopolitics" compared to your objectives which are "geoscience."

It is my understanding that the OSN proposal was submitted in good faith as a Supplemental Science, add-on (or whatever we're calling it) proposal. Whether it or any of the other S proposals exceeded the time limits was a later, separate decision for PCOM as was the decision to end the "add-on proposal" experiment. It was certainly not a "concept already put to rest" as you seem to suggest.

The timing may have been unfortunate but it did respond to an OHP and PCOM initiative. To label someone else's science as "geopolitics" because it doesn't fit one's own niche is not helpful. ODP has lots of inertia but it has to try and respond <u>whenever</u> good ideas come in, convenient or not. It also has to try and remain flexible and responsive to other major geoscience programs if it is to be renewed.

Having got that off my chest, I look forward to the discussion that will decide this (and at least one other "S proposal" issue of interest) at the next PCOM.

Sincerely,

Tom

Thomas E. Pyle
Vice President and Director,
Ocean Drilling Programs

cc: PCOM Members
Thematic Panel Chairs
B. Malfait

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000606

28 August, 1991

Dr. Bobb Carson
Department of Geological Sciences
Lehigh University, #31
Bethlehem, PA 18015-3188

Dear Bobb:

On behalf of the JOIDES Planning Committee, I want to congratulate you on your appointment as a co-chief (with Graham Westbrook) for Leg 146 drilling off Cascadia.

With that job comes a great deal of responsibility, as I am sure you are aware. Among your first tasks will be staffing the leg and preparing a drilling prospectus, which in the case of Leg 146 will be based primarily on the Cascadia-DPG report (October 1990 *JOIDES Journal*). Much of the DPG report focused on the study of fluid processes along the Cascadia margin, and it is in this context that I am writing to you. Recently, PCOM learned that Geoprops will not be ready for test deployment on Leg 141, Chile Triple Junction, as originally scheduled. Part of the reason for that decision is that the Geoprops tool did not measure up during bench testing, which gives ODP-TAMU the right to delay its deployment on the *Resolution*. Dan Karig, the proponent for Geoprops, has indicated that he is unwilling to pursue the project further (because that would entail writing another proposal to ODP/NSF, which he has neither the time nor the willingness to do). This has put the advisory structure in a quandary regarding the future of this tool.

PCOM, at its meeting in Hannover just concluded, has reiterated its support for Geoprops, and has further advised JOI that "special" monies should be made available for its continued development, hopefully in time for test deployment of the tool on Leg 146. These monies (to come from an increment which NSF <u>may</u> make available in FY92 to pursue scientific objectives delineated by ODP's Long Range Plan) will not be accessible in any event until after January 1, 1992; timing will be up to JOI and NSF. Nonetheless, Geoprops, and fluid sampling on Leg 146 in general, needs a champion. PCOM is hoping that the Leg 146 co-chiefs will take up where Dan Karig has left off, in order to assure Leg 146 some kind of <u>in situ</u> physical properties/fluid sampling capability. If NSF makes the above money available for Geoprops development, your role would be to advise ODP/TAMU engineers on further development of the Geoprops tool. If these monies do not become available, a separate proposal to NSF might have to be written to fund the tool's continued development. Are you and/or Graham willing to take on these tasks? For your information, guidelines on "third-party tool development" have been published in the February 1991 *JOIDES Journal*. When you have had a chance to peruse those, give me a call and we can discuss them.

PCOM is also concerned that Leg 146 may be seriously impacted if no reliable fluid sampling capability were to be available in time for drilling off Cascadia. This is an issue larger than Geoprops. For your information, the entire fluid sampling issue is currently being debated by a special group convened for the purpose by Paul Worthington, chair of DMP. PCOM is interested in co-chief input on how Leg 146 would need to be modified in that eventuality (i.e., perhaps to emphasize clathrate sampling). We will need co-chief response on this matter before mid-November, as PCOM may have to consider the issue of modifying Leg 146, based in part upon such input, at its Annual Meeting with panel chairs in early December in Austin.

I know that this is a lot to absorb at one blow, so let it all sink in and give me a call at your convenience and we can discuss the matter further. Feel free to discuss these matters with Graham before getting in touch with me. Thanks again for your service in support of ODP.

Sincerely,

James A. Austin, Jr.

James A. Austin, Jr.
Senior Research Scientist
Chair, JOIDES Planning Committee

JAA/km

cc: T. Francis, ODP/TAMU
S. Humphris, LITHP
B. Malfait, ODP/NSF
J. McKenzie, SGPP
E. Moores, TECP
T. Pyle, JOI
N. Shackleton, OHP
G. Westbrook, co-chief, Leg 146
P. Worthington, DMP

000608

September 20, 1991

Dr. Bobb Carson
Department of Earth and
Environmental Sciences
Building 31
Lehigh University
Bethlehem, PA 18015

Dear Bobb:

As promised, our engineers have had a good look at the 2 existing Geoprops tools and I now enclose a report on "Feasibility of Continued Development of the Geoprops Probe" by Scott McGrath. Briefly, the ODP-TAMU view is as follows:

1. The Geoprops Probe is an ingenious device which can be made to work.

2. The design philosophy seems to have been to make an instrument as cheaply as possible to work once/a few times. Reliability for repeated use has **not** been considered in the design of the existing tools.

3. Whether Geoprops will work downhole depends not only on the tool functioning properly, but on enough of the 15 ft. pilot hole drilled by the MDCB remaining clean enough to accept it (about 10 ft.). This aspect of Geoprops operation can only be tested at sea.

We therefore propose a two stage approach to the continued development of Geoprops:

Phase 1: To consist of testing, modifications, preparation of support equipment, spares, documentation. This work will be the responsibility of ODP-TAMU, but in order to minimize its impact on our engineering manpower, done largely by an outside consultant. Modifications to the 2 existing tools will be minimized. The objective will be to have sea trials on Leg 143 (4 MDCB/Geoprops runs would require 2 days of ship time, but might contribute to the scientific objectives of that Leg) and operational deployment on Leg 146 (Cascadia). The cost of this phase, not including ODP-TAMU staff time, is estimated at $33K.

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Subject to the success of the Leg 146 deployments, a decision would then be made to proceed to:

Phase 2: The purpose of this phase would be to convert the prototype instruments, now proven to have worked in the field, into reliable tools for repeated use over the long term. The cost of this phase is estimated (roughly) at $57K. ODP-TAMU will not be able to accept long-term responsibility for Geoprops as an "ODP Mature Tool" until Phase 2 has been successfully completed.

Please note that if the Phase 1 development is to go ahead on schedule, we must have funding approval by 1 November 1991 at the latest. Good luck in your efforts to secure this additional funding.

Yours sincerely,

Tim

Timothy J.G. Francis
Deputy Director

TJGF:hk

xc: Dr. J. Austin, JOIDES PCOM
Dr. P. Worthington, JOIDES DMP
Dr. B. Malfait, NSF
Dr. T. Pyle, JOI
Mr. B. Harding, ODP
Dr. A. Meyer, ODP

Lehigh University

000610

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Dr. James A. Austin, Jr.
Senior Research Scientist
Chair, JOIDES Planning Committee
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8701 Mopac Boulevard
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31 October 1991

RECEIVED
NOV 05 1991
Ans'd...........

Dear Jamie:

I have deferred my response to your letter of 28 August so that I could apprise you of recent developments regarding the Geoprops probe. I limit my discussion in this letter to Geoprops, and will send you another shortly that addresses the larger issue of fluid sampling. That response will include some of Graham Westbrook's wisdom; this one is based largely on my own activities, as I have taken responsibility for Geoprops.

Prior to receipt of your letter, Dan Karig had contacted me and apprised me of the state of the tool and the fact that someone other than he would have to take over further development. I have agreed to take on that task and see Geoprops to full operational status. To that end, I requested of ODP a detailed assessment of the two existing Geoprops tools and the estimated cost of bringing them to completion. The detailed report prepared by Scott McGrath (ODP; 16 September 1991) is enclosed, as is a cover letter from Tim Frances. The report recommends that development proceed in two stages. The first stage ($33,000) will make the existing tools functional, and should permit testing at sea during Legs 143 /144, so that further modifications could be made prior to Leg 146. The second phase ($90,000) entails design changes required to minimize future maintenance, increase reliability, and the bring the instrument to the status of a fully mature ODP tool. In addition to finding the necessary funds, Tim Francis informed me that those monies would have to be available by 1 November 1991, if modifications to Geoprops were to be completed prior to Leg 143. As you can see from the report, alterations to the instrument would be made by an outside consultant, as the ODP engineering staff is presently fully committed to other items prioritized by PCOM. Nevertheless, Tim agreed that ODP would provide oversight to the Geoprops development program.

On October 10, I submitted a supplement to my existing NSF grant, which included a request for $33,000 to cover the phase 1 costs for modifying Geoprops. This approach was the only one that could provide funding in time to meet the November 1 deadline. Bruce Malfait has approved that request. The fly in the ointment with this approach is that the supplement budget is nearly as large as the initial grant, and NSF Grants and Contracts may balk. Nevertheless, Bruce and Tom Pyle have agreed to find the funds elsewhere if my supplemental request is denied.

To this point, all of the obstacles to continued Geoprops development envisioned by PCOM at its last meeting have been surmounted: a Leg 146 co-chief has assumed responsibility for continued development at no cost to NSF or ODP, the funds have been acquired to ready the instrument for sea trials and subsequent operation on Leg 146, and a mechanism has been worked out to expedite the alterations without directly involving the ODP engineering staff. However, ODP will have much closer control on development of the instrument heretofore than was apparently the case in the past.

Having said all of this, however, I am informed by Tim Francis today that it will not be possible to test Geoprops on Legs143/144; downhole testing is to be deferred to Leg 146. To say that I am not taking this news well is, at best, an understatement. Having dropped much of my other research activity over the past two months to forge a workable development plan and obtain the necessary funding to place Geoprops on Legs143/144 for testing, I am incredulous that we cannot find time to run the instrument down a hole. I sympathsize with the 143/144 co-chiefs, but I find it difficult to believe that the 6-12 hours required to pump down the MDCB and Geoprops probe for at least one test cannot be found. I suggest that it is time for PCOM to wield a heavy hand.

We have all waited over 4 years for Geoprops to appear. Its use has been repeatedly recommended by DMP in accretionary prism settings (Nankai, Chile Triple Junction, Cascadia) as the primary tool that will provide both fluid samples and measure hydrogeologic properties (primarily *in situ* pore pressure and permeability). Yet with the advent of 146, a leg which cannot ignore fluid advection (even if its emphasis was to be redefined as you suggested in your 28 August leter), it is unbelievable that we would put to sea with an untested tool when that need not occur.

I trust that you will bring this matter to PCOMs attention. In the meantime, I will continue to move development of Geoprops forward as quickly as possible. I must say, however, this decision takes a good deal of heat off both NSF and ODP, and will make my job that much more difficult.

Sincerely,

Bobb Carson

Bobb Carson
Professor of Earth and
Environmental Sciences

cc: T. Francis
G. Westbrook

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000612

6 November 1991

Dr. Bobb Carson
Department of Earth and Environmental Sciences
Lehigh University
Williams Hall 31
Bethlehem, PA 18015-3188

Dear Bobb:

Thank you for your letter of 31 October, and for taking over the complex task of overseeing and funding Geoprops development. Fluid sampling is a much bigger issue in ODP than its application during Leg 146, as I am sure you are aware. Your stewardship of this tool will benefit not only the Cascadia program, but all future fluid sampling objectives that many in the JOIDES advisory structure hold dear.

The issue of exactly when to test a third-party tool at sea is a complex one. First, the tool must be ready, and in my opinion ODP-TAMU may have been a bit optimistic when they targeted one of the Atolls & Guyots legs for a pre-Cascadia test of Geoprops. My conversations with ODP-TAMU personnel have led me to believe that extra time will be necessary for bench-testing ashore. Second, deployment of Geoprops requires co-deployment of the MDCB. Although the MDCB will be tested during Leg 141, your assessment of 6-12 hours for a Geoprops test during Atolls & Guyots is almost certainly an underestimate (a matter on which you will be receiving some further information from Tim Francis soon).

You imply that PCOM has gone back on its own intiative regarding the Geoprops tool. That is simply not the case. I remind you of our action in this regard at the August 1991 meeting in Germany:

"PCOM reaffirms the critical importance of the development of GEOPROPS, or tool of comparable capability, as an integral part of scientific planning. PCOM further recommends that OPCOM funds be made available as soon as practicable to further this aim. *PCOM anticipates that a suitable tool could be tested on Leg 146.*" [italics mine]

You also suggest that a delay in an at-sea test will hurt your initiative to field a suitable tool. My conversations with personnel at both NSF (Malfait) and ODP-TAMU (Francis) suggest otherwise. Everyone is aware of the urgency of this situation, and speed records will likely be broken to get you and Graham Geoprops for Cascadia.

OCEAN DRILLING PROGRAM

Having provided you with both praise and information, I now venture a criticism. I sense a growing attitude in ODP which I find both distressing and distasteful: "Do it on the other guy's leg, not on mine." We all know that drillship time is precious, and PCOM spends many hours trying to devise plans that use it wisely. In that capacity, PCOM has already asked the Atolls and Guyots co-chiefs to accommodate a 60-hour test of the shallow-water drilling capability of *Resolution* during Leg 143, and both legs 144 and 145 may have "supplemental" science objectives added to their prospectuses which were not anticipated by the co-chiefs of those legs. My own opinion (not PCOM's; I will include your letter to me and this response in the Agenda Book of our December meeting and schedule time for discussion.) is that we have asked the Atolls and Guyots co-chiefs to do enough science/engineering that is not directly related to their own objectives. Put yourself in their place. Cascadia already benefits (through simple logistics) from more on-site time than any other leg in the FY 92 Pacific schedule. A viable at-sea test of Geoprops in the spot where it is needed the most, and where the co-chiefs will take the time to do the test(s) properly because their own scientific interests are involved, seems not only logical but wise. A "heavy hand" simply is not required in this case, in my opinion.

I will advise you of any PCOM action on this matter following the December meeting. Thank you for your input.

Sincerely,

Jamie

James A. Austin, Jr.
Senior Research Scientist
Chair, JOIDES Planning Committee

JAA/ja

cc: T. Francis
B. Malfait
T. Pyle
G. Westbrook

000614

November 7, 1991

Dr. Bobb Carson
Department of Earth and
Environmental Sciences
Building 31
Lehigh University
Bethlehem, PA 18015

RECEIVED
NOV 0 8 1991
Ans'd............

Dear Bobb:

Geoprops Probe

This is to summarize the state of play with Geoprops.

1. Following my letter to you of 20 September 1991 and your successful efforts in securing \$33K for phase 1 of the continued development of Geoprops. we have now been authorized to proceed with this work.

2. In my letter of 20 September, we proposed aiming for sea trials on Leg 143. Following the recent Leg 143/144 pre-cruise meeting and discussions between the Leg 143/144 Co-Chiefs and PCOM Chair, it has been decided that there is insufficient time on Leg 143 to conduct MDCB/Geoprops tests. Testing of *JOIDES Resolution*'s shallow water drilling capability in Enewetak Lagoon is now scheduled for the end of that leg. The possibility of 3+ days being spent in logging Hole 801C (Jurassic crust) on Leg 144 is still on the cards, and will be decided at the December PCOM. This effectively rules out Leg 144 for Geoprops.

   This means that the first sea trials of Geoprops have now slipped to Leg 146 -- your leg. I hope that you are not too frustrated by this. As you know, the drill ship is a unique facility in great demand by a very large scientific community. We could keep it fully occupied to the end of the century on existing proposals.

3. If you want to discuss technical aspects of the Geoprops work, please contact Dave Huey, Supervisor of Engineering Development, or Scott McGrath, Development Engineer, here at ODP-TAMU. Note that both Dave and Scott will be at sea on Leg 141.

Best regards,

Tim

Timothy J.G. Francis
Deputy Director

TJGF:hk

xc: Dr. J. Austin, JOIDES PCOM
Dr. P. Worthington, JOIDES DMP
Dr. G. Westbrook, Leg 146 Co-Chief
Dr. B. Malfait, NSF
Dr. T. Pyle, JOI

Mr. B. Harding, ODP
Dr. A. Meyer, ODP
Mr. D. Huey, ODP

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000615

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Oct. 28, 1991

RECEIVED
NOV 0 5 1991
Ans'd............

Dr. James A. Austin
Institute for Geophysics, University of Texas at Austin
8701 Mopac Blvd.
Austin, TX 78759-8345

Dear Jamie:

Miller, Mountain, and Christie-Blick have proposed an ODP drilling transect of the middle Atlantic continental shelf and slope offshore New Jersey (Proposal #348). This "Mid-Atlantic Transect" (MAT) serves as one of the primary ODP legs on siliciclastic margins that is dedicated to sea-level change. We are optimistic that a major portion of the MAT boreholes can be drilled by the *JOIDES Resolution* during May-June 1993 or 1994. Of twelve proposed offshore holes, 9 are within what we understand to be the water depth range of dynamic positioning (>50 m).

As recognized by COSODII, the JOI/USSAC Sea-level Workshop, and the JOI Sea-level Working Group, drilling by the *Resolution* alone is not sufficient to address the sea-level issue. The MAT project serves as an excellent example. In order to address the timing and magnitude of late Oligocene to Recent relative sea-level changes we must:

1) drill five boreholes on the adjacent coastal plain to depths of ~1500' (500 m). We have submitted a preliminary proposal to NSF/EAR for these boreholes. We hope to work collaboratively with the U.S.G.S. on the scientific aspects and use their drilling rig.
2) drill three boreholes on the New Jersey inner continental shelf in water depths less than 50 m; this probably requires a supplementary platform (e.g., barge or jack-up rig). This letter is to inform you of progress made on the offshore supplementary platform.

We have obtained one quote for proposed Sites MAT1-MAT3 on the inner continental shelf from Warren George Inc. ($1,768,450). A copy is enclosed. Their price is similar to that for the Ginsburg-Bahamas drilling (in which Warren George used a jack-up rig) considering our greater water depths and depth of penetration. Price quotes were solicited from Tonto, Longyear, and CBC-Boyles Bros. They have declined to submit quotes. We welcome additional suggestions for drilling companies who are capable of this work.

We would like for you to open discussions with ODP engineers as to the feasibility of using the *Resolution* in a dynamically positioned mode to drill in water depths of greater than 50 m. How realistic is it to drill in 50-90 m of water with the *Resolution*? Is it possible to use the *Resolution* to drill on the inner shelf in water depths <50 m perhaps by anchoring to buoys? This may not be the best use of a dynamically positioned drillship, but could be implemented at a considerable savings.

Sincerely yours,

Ken

Kenneth G. Miller

Greg

Gregory S. Mountain

x/c D.V. Kent, B. Malfait, T. Pyle, P. Rabinowitz

000616

Foot of Jersey Avenue
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WGI Warren George Inc.

SUBSURFACE EXPLORATION

New Jersey (201) 433-9797
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October 22, 1991

Rutgers University
Dept. of Geological Sciences
New Brunswick, NJ 08903
Attn: Dr. Kenneth Miller

**PRELIMINARY PROPOSAL FOR
DRILLING AND CONTINUOUS CORING
OF THREE DEEP MARINE BOREHOLES
SOUTHERN NEW JERSEY**

Dear Dr. Miller:

Warren George, Inc. is pleased to present our proposal to drill and continuously core three deep boreholes in southern New Jersey. We understand that these holes are an extension of the scientific efforts of the Ocean Drilling Program.

General information on our qualifications and drilling methods has been submitted in a previous proposal dated July 9, 1991. This proposal adds information and costs for performing similar borings over water.

Borehole Sites

The approximate locations and depths of the holes to be drilled are given below. The sites are near Barnegat Light off the New Jersey coast. Water depths are 110 feet.

MAT1	1980 ft
MAT2	2475 ft
MAT3	2475 ft

Proposed Equipment

The drilling equipment and coring tools have previously been described. The marine equipment is described below:

Jack-up Vessel. We proposed a jack-up vessel for this work because of its relative insensitivity to sea conditions during the drilling operations. We have used jack-ups in numerous past investigations.

The jack-up proposed is the "Gulf Island V" operated by Power Offshore in New Orleans, Louisiana. This vessel has made two previous trips to the east coast for Warren George, Inc. coring projects. The vessel has three 175-ft long legs that are hydraulically jacked to the ocean bottom. The legs are fitted with large steel pads. Once the legs are on bottom, the jacking action lifts the hull out of the water.

The vessel must be jacked high enough above the waves to prevent wave forces on the hull. The distance above the waves is called the "air gap." In addition, depending on the bottom softness, the legs may penetrate some distance into the bottom. Both of these constraints limit the depth of water in which the vessel can be safely jacked. On a firm bottom and with moderate sea conditions, the "Gulf Island V" can jack in about 110 feet of water.

The vessel has onboard living accommodations for 12 persons in addition to the crew. A fully staffed galley will prepare 3 meals and a midnight snack each day.

A data sheet on the vessel is attached.

Supply Vessel. We propose the use of our tug "Sandy G" for logistical support. We anticipate making about two trips per week with fuel, water, and other supplies. The "Sandy G" is 58-ft long by 18-ft wide and 7-ft deep. It is powered by two 8-92 turbo diesels.

Personnel

We propose to operate on a "round-the-clock" basis to fully utilize the expensive jack-up vessel. The workday will be divided into two 12-hour shifts. Each shift will have a three-man drill crew. To oversee operations, we will also have a full-time superintendent onboard. The vessel will have a fulltime crew of 5.

Estimated Cost/Schedule

Our estimated fee to mobilize the vessel and drill the borings is as follows:

Task	Quan	Unit	Unit Rate	Total
Mobilization	1	ea	$450,000	$450,000
Set-up at Each Site	3	ea	$25,000	$75,000
Drill and Core	6930	ft	$150	1,039,500
Set Temporary Casing(s)	---	ft	$60	$ ------
Casing Left in Hole	---	ft	$20	$ ------
Grouting Borehole	6930	ft	$15	$103,950
Demobilization	1	ea	$100,000	$100,000
Standby for Client	---	hours	$700	------
Estimated Total				$1,768,450

The above prices include all personnel and equipment to drill and core the holes.

We recognize that the drilling is not expected to occur until late 1993 or early 1994. Accordingly, we must stress that our prices reflect 1991 costs for equipment and personnel. Note that the jack-up vessel market can be extremely volatile.

We estimate that it will take approximately 2 months to drill the three locations.

* * *

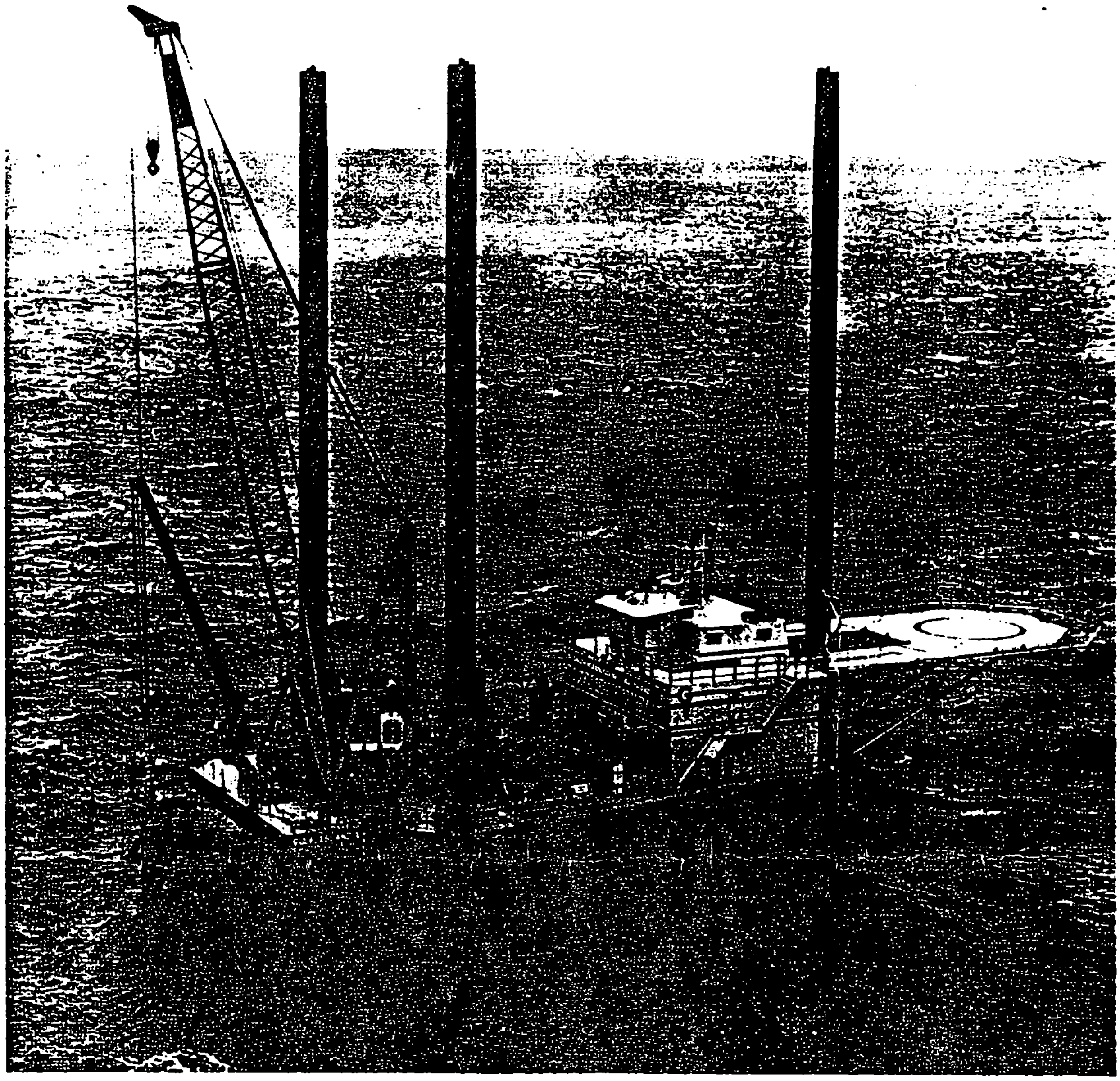
Ken, we look forward to assisting you on this challenging project. Call me if you need additional information.

Sincerely,
Warren George, Inc.

Lowell V. Babb

Lowell V. Babb
Vice President

GULF ISLAND V



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000640 6 November 1991

Dr. Gregory S. Mountain
Lamont-Doherty Geological Observatory
Palisades, NY 10964

Dr. Kenneth G. Miller
Department of Geological Sciences
Rutgers, The State University
New Brunswick, NJ 08903

OCEAN DRILLING PROGRAM

Dear Greg and Ken:

Thank you for your letter of 28 October regarding planning for shallow-water and/or land drilling to accompany proposed New Jersey sea level/Middle Atlantic Transect ODP sites. Let me fill you in, briefly, on steps that PCOM has taken recently to implement the Long Range Plan strategy to incorporate "additional" platforms into ODP.

1. At its August meeting, PCOM endorsed its "Opportunity Subcommittee" (OPCOM) recommendations regarding the use of anticipated "new" monies in FY 92 and FY 93 for "additional" drilling platforms. The dollar figure OPCOM arrived at for this activity was $1.7M, an interesting correlation with your quote from Warren George Inc. Further, OPCOM recommended, and PCOM endorsed, a feasibility study on the availabilities and capabilities of "additional" drilling platforms by an outside expert. Herb Zaremba (formerly with AMOCO, the acknowledged expert in drilling platforms recommended by TEDCOM), is currently writing a proposal to JOI/NSF for support to conduct this study, which might be completed by early 1992. By copy of this letter and your letter to me, I will inform Zaremba of your activities. He already has a copy of the North Atlantic Prospectus, a part of which is proposal #348.

Please bear in mind that while monies have already been made available to fund the Zaremba study (by "robbing Peter to pay Paul", a time-honored academic technique), dollars to hire a non-*Resolution* platform will not be available until 1992, and their status at that time depends upon the pace of renewal and other factors. I will keep you informed.

2. PCOM has authorized a test of the shallow-water drilling capability of the *JOIDES Resolution* in the lagoon of Enewetak atoll at the end of Leg 143. This should give PCOM a better understanding of the vagaries of dynamic positioning the drillship in water depths of ~30-40 m. SEDCO has also informed ODP-TAMU that drilling with the SEDCO/BP 471, in DP mode, should be possible in water depths of 50-90 m. However, as you are well aware, the open continental shelf off New Jersey and a central Pacific lagoon are very different tests of DP. Success at Enewetak does not guarantee success off New Jersey! Nonetheless, it will be a start on a learning curve.

By the way, it is PCOM's understanding at the moment that anchoring the *Resolution* is not feasible, but that may be predominantly a matter of cost (i.e., a separate ship to carry/deploy anchors, combined with inadequate deck space on the drillship for that kind of mooring capability).

I will bring your letter to the attention of PCOM at its next meeting in December, when we will set the FY 93 drilling schedule. Once again, thank you for your input, and your continuing interest in ODP.

Sincerely,

Jamie

James A. Austin, Jr.
Senior Research Scientist
Chair, JOIDES Planning Committee

JAA/ja

cc: T. Francis
B. Malfait
A. Maxwell
T. Pyle
H. Zaremba

000622

Bermuda Biological Station for Research, Inc.

Ferry Reach, GE 01, Bermuda (809) 297-1880 Fax (809) 297-8143 Telex BA 3246

Dr. James A. Austin Jr.
Institute for Geophysics
University of Texas
8701 N. Mopac Blvd.
Austin, TX 78759
USA

September 6, 1991

Dear Dr. Austin:

I am writing in regard to a telephone conversion I had with Karen Meador discussing the possibilities of holding a conference in December 1992 at the Bermuda Biological Station for Research, Inc. (BBSR). If you decide to hold the meeting at BBSR, please be sure to make tentative reservations as soon as possible. Having meetings or arrivals and departures does not present difficulties on weekends, however our business offices operate on a Monday to Friday 9-5pm basis. I would be at your service throughout the conference including weekends. I would assist in all aspects of your workshop/conference planning. The following is basic information on our conference facilities.

The Biological Station is situated on a 15-acre property. In addition to the main dormitory building's single and double rooms, one-, two-, and three-bedroom apartments and cottages accommodate our visitors. Please advise participants that we are a working field station and accommodations are basic but clean and comfortable. Three meals a day are provided cafeteria style in our Dining Hall.

Conference facilities available include the newly completed Hanson Hall which will accommodate approximately 250 persons theatre style, an additional lecture hall which has a seating capacity of 80 when arranged theatre style and two smaller meeting rooms which will accommodate a group of up to 35. We have three teaching labs which can accommodate up to 35 people and could also be utilized as meeting rooms should your group wish to break off into smaller units. Various audio/visual equipment is available and can be set up in any of the meeting rooms or labs.

The airport is approximately 5 minutes from the Biological Station and taxi fare is \$7.00-\$9.00. Participants must arrange their own taxi from the airport to the station, however, I would arrange taxi's for departure. Most tourists rent mopeds or bicycles while on the island because cars are not for hire. An adequate bus service and mini-bus service are also available The business centre, the City of Hamilton, is approximately 15 miles from BBSR and the village of St. George's is approximately 2 miles away.

Our 1991 conference rate is $120 per participant, per day. Spouses may attend at a rate of $52 per day which includes meals and accommodation. Our 1992 Schedule of Fees is not yet published, however, the usual increase is 5-10% each year. The conference rate includes the following facilities and services: 000623

- room and board for each participant;
- the meeting room(s) or lab(s) your group uses;
- audio/visual equipment;
- photocopy machine use;
- office supplies (tablets and pens);
- coffee breaks (two per day);
- cocktail party on the day of arrival
- the services of our conference coordinator; and
- the use of our Senior Common Room (BBSR bar/club).

We will provide a "welcome packet" for each participant which will include information about BBSR, a map of Bermuda, a bus schedule, identification badges and the agenda for your meeting. We will be happy to enclose any other information from you that your participants will need upon arrival.

We will also be pleased to arrange for any special events, such as a dinner off Station for your group. Activities can be arranged for spouses of participants so that their experience also can be an enjoyable one. And we will be glad to help you arrange for any special services such as secretarial help or computer rental.

A $100 deposit from each participant is required four months in advance. Should you make definite reservations, we will forward forms. Please ask each participant to complete the Participant Information Form to be sent directly to my attention along with his/her $100 deposit. Please emphasize to your participants that we cannot hold a room without a deposit and a completed Participant Information Form. The Biological Station accepts cash, travellers cheques, personal cheques, Visa and Mastercard. We do not, however, accept American Express.

Should you require further information, or change your requirements, please do not hesitate to contact me by facsimile at 809-297-8143, by telephone at 809-297-1880, or by telemail to BDA.BIOSTATION.

Thank you for your interest in the Bermuda Biological Station for Research, Inc. for your conference site. We look forward to hearing from you soon.

Sincerely,

I. L. Bondi

Isabella Bondi
Conference Coordinator

cc: Dr. T. Knap, Director, BBSR

Encl: Conference Info. flyer.
Schedule of Fees (91)

000624

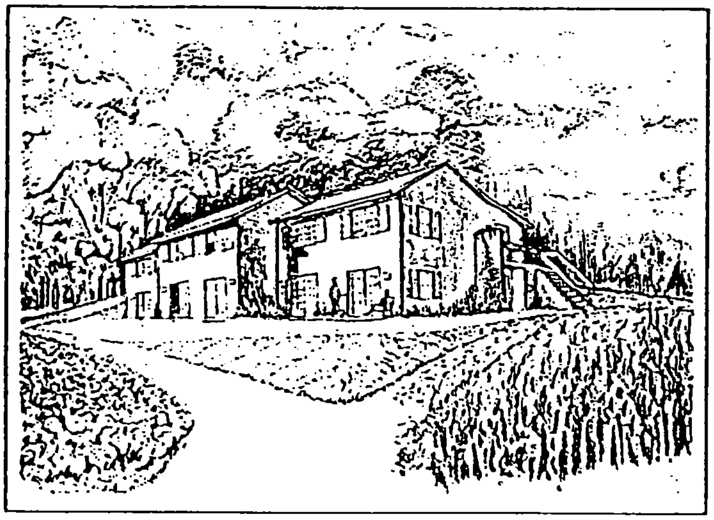
BBSR CONFERENCE FACILITY

Conference facilities:

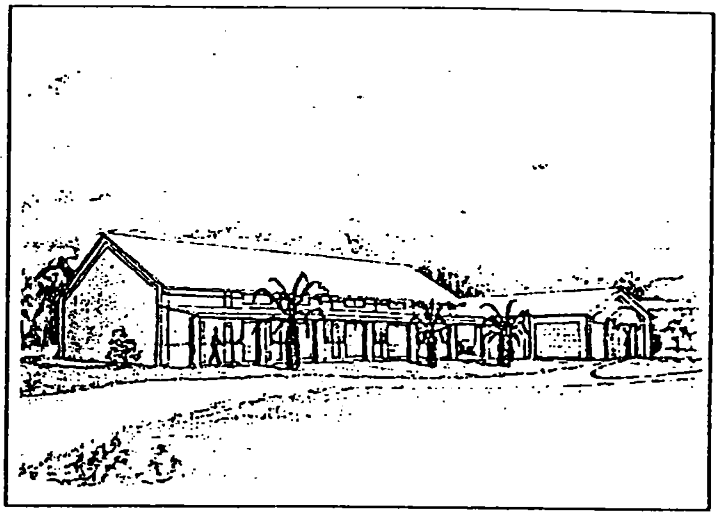
- modern lecture hall with flexible seating for 50 - 200 people
- enlarged video projection, slide & overhead projection
- three smaller "conference" rooms for working sessions
- guest-house type housing with cafeteria style dining
- full access to a 20,000 volume marine science library
- group laboratory space
- computer facilities
- Omnet E-mail link to the international scientific community arranged on request

BBSR: a center for marine & atmospheric science

- an independent U.S. non-profit research and educational institution established in 1903 and incorporated in New York in 1926 but located in Bermuda
- a scenic campus near the East End of Bermuda on fifteen acres of tropical park with the airport located 5-10 minutes away
- all facilities on site with an all inclusive conference rate significantly lower than typical resort rates Cocktail reception and daily coffee included in rate
- field trips to reefs and wreck sites can be arranged



New housing scheduled for completion in April, 1991.



Hanson Hall

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—Gilbert M. Grosvenor
President and Chairman,
National Geographic Society
at the dedication of Hanson Hall,
December 8, 1990.

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Bermuda Biological Station for Research, Inc.
St. George's, GE 01
Bermuda

Telephone.: (809) 297-1880
Fax: (809) 297-8143
Telex: BA 3246

Inquiries to: Conference Coordinator, ext. 243

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Oceanography Adm Bldg 104
Corvallis, Oregon
97331-5503

Telephone
503-737-3504
Fax
503-737-2064

000625

22 August, 1991

RECEIVED
AUG 2 9 1991
Ans'd............

Dr. James A. Austin Jr.
PCOM Chairman
Senior Research Scientist
Etc.
The University of Texas at Austin
Institute for Geophysics
8701 Mopac Blvd.
Austin Texas 78759-8345

Dear Jamie

Thank you for the opportunity to present some of the results from Leg 138 to PCOM. I hope that the information was useful to the committee.

On the plane home I had more than enough time to think about the question of how the paleoceanography community or any sector of ODP could utilize the ship for extended periods of time. As you can tell I do not believe that giving the drill ship to any community for a long period is in the best interest of doing good science.

One way to determine an answer to your question about paleoceanographers using the drill ship for two years say is by examining the numbers of good proposals that have been submitted to JOIDES. I have restricted these lists to objectives achieved with APC/XCB type drilling to be able to also address the question of an alternate platform.

In the first 40 legs of ODP there have been 7 legs which were focused solely towards paleoceanographic objectives which could be achieved by APC/XCB drilling, 105 (which I am not that familiar with), 108, 113, 114, 117, 133, 138. Three legs where drilled with paleoceanography being half of their primary objective, 112, 115 and 130 (half of the Leg 130 was dedicated to paleoceanography but the only reason it was scheduled was because of OHP's very high ranking of that half). With respect to the future option of using a smaller alternate platform, two of these legs could not have been completed with a smaller ship (113 and 114).

I would guess that if we looked at all paleoceanographic proposals submitted to JOIDES that these proposals would also represent the best surveyed programs submitted. But even so, the quality of survey data for these legs is highly variable. I know that Legs 117, 130, and 138 all had excellent seismic, seabeam and regional sediment studies available before drilling. The quality of data for Leg 133 was also excellent; 114 had good seismic for all sites but no seabeam and limited regional sediment studies;

Oregon
State
University

113 had mixed quality of site survey data (it's the only carbonate depth transect drilled where there was no evidence from the site survey to show that there was any carbonate sediments to drill); and 108 had site survey data only sufficient to demonstrate that the youngest parts of the section were paleoceanographically useful but the recovery of even middle and early Neogene sections could not be achieved on this leg.

I can't think of any proposal submitted to JOIDES that contained the quality of data available for legs 130 or 138 and were not considered of very high priority. This may reflect the limitation posed by outside funding of regional studies. There is clearly not sufficient monies in agencies such as NSF to fund all field program to support drilling proposals. A case in point is our effort to get NSF to fund a California Current study to support drilling in this important oceanographic regime.

Thus, because of this measure of effort from the paleoceanographic community (about 12 legs in 6 years) and because of my belief that to spend over $80 million on two years of drilling without having the best possible regional studies completed before drilling is foolish, I don't see the paleoceanographic community being able to properly utilize a drill ship for a continuous extended period of time.

Again thanks for the opportunity to present the results of Leg 138 to PCOM. Keep up the good work leading JOIDES.

Sincerely,

Nicklas G. Pisias
Professor of Oceanography

P.S. Note I have not included arguments about the availability of funds and people to work on results of these legs.

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Proposals received since July 1991, except those included in the North Atlantic Prospectus 1991

(Sorted by "Received")

Ref.No	Received	Abbreviated Title	Contact	Status
400----	09/03/91	Mass balance/def. mech., Middle Am. Trench/Costa Rica	Silver, E.A.	In Review
401----	09/05/91	Evolution of a Jurassic Seaway, SE Gulf of Mexico	Buffler, R.T.	In Review
402----	09/09/91	Geochemical anomaly in MAR basalts between 12°-18°N	Sobolev, A.V.	In Review
403----	09/09/91	KT boundary in the Gulf of Mexico	Alvarez, W.	In Review
404----	09/11/91	Neogene paleo. from W North Atlantic sediment drifts	Keigwin, L.D.	In Review
405----	09/12/91	Amazon fan growth and climate, denudation, sea-level	Flood, R.D.	In Review
406----	09/16/91	North Atlantic climatic variability	Oppo, D.	In Review
407----	09/16/91	North Atlantic shallow mantle at geochemical anomaly	Dick, H.J.B.	In Review
408----	09/16/91	Testing two new interpretations, N Nicaragua Rise	Droxler, A.W.	In Review
409----	10/04/91	Late Quaternary paleo., Santa Barbara Basin	Kennett, J.P.	In Review
361-Add	10/25/91	Site survey, TAG hydrothermal field, MAR 26°N	Thompson, G.	**Ranked 1991**

Proposal log sheets and abstracts of these proposals are appended.

Proposals included in North Atlantic Prospectus 1991(NAP91)

(Sorted by "Ref.No")

Ref.No	Received	Abbreviated Title	Contact	Status
323-Rev	02/11/91	Alboran basin and Atlantic-Mediterranean gateway	Comas, M.C.	**Ranked 1991**
330----	07/17/89	Accretionary prism and collision, Mediterranean Ridge	Cita-Sironi, M.B.	**Ranked 1991**
330-Add	01/22/90	Accretionary prism in collisional context, Med. Ridge	Cita-Sironi, M.B.	**Ranked 1991**
330-Add2	09/10/91	Accretionary prism in collisional context, Med. Ridge	Cita-Sironi, M.B.	**Ranked 1991**
346-Rev2	08/14/91	Ivory Coast - Ghana transform margin	Mascle, J.	**Ranked 1991**
348----	08/16/89	Paleogene/Neogene stratigraphy, U.S. Atlanic margin	Miller, K.G.	**Ranked 1991**
348-Add	08/30/91	Uppper Paleogen to Neogene U.S. mid-Atlantic transect	Miller, K.G.	In Review
361-Rev	03/01/91	Hydroth. system, slow-spread. ridge, MAR 26°N (TAG)	Thompson, G.	**Ranked 1991**
369-Rev	09/09/91	Generation of oceanic lithosphere, MARK area	Casey, J.F.	**Ranked 1991**
369-Add	09/16/91	MK2: deep hole in oceanic upper mantle	Mevel, C.	**Ranked 1991**
376-Rev	09/16/91	Layer 2/3 boundary and vertical tectonics, VEMA F.Z.	Mevel, C.	**Ranked 1991**
380-Rev2	09/12/91	VICAP, Gran Canaria	Bednarz, U.	**Ranked 1991**
388----	10/01/90	Neogene deep water circ. and chemistry, Ceara Rise	Curry, W.B.	**Ranked 1991**
388-Add	09/06/91	Add. to Neogene deep water circ. and chem., Ceara Rise	Curry, W.B.	**Ranked 1991**
391----	01/02/91	Formation of sapropels, eastern Mediterranean	Zahn, R.	**Ranked 1991**
391-Add	09/12/91	Formation of sapropels, eastern Mediterranean	Zahn, R.	**Ranked 1991**
NAAG	04/11/91	North Atlantic - Arctic Gateways DPG Report	Ruddiman, W.F.	**Ranked 1991**
NARM	09/10/91	North Atlantic Rifted Margins DPG Report	Larsen, H.C.	**Ranked 1991**

See NAP91 for proposal log sheets and abstracts of these proposals.

000628

000629

ODP Proposal Log Sheet 400----

Proposal received: Sep 3, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

Proposal for the Ocean Drilling Program for Determination of Mass Balance and Deformation Mechanisms of the Middle America Trench and Accretionary Complex off Costa Rica

E.A. Silver, T.H. Shipley and K.D. McIntosh

Abbrev. Title: Mass balance/def. mech., Middle Am. Trench/Costa Rica	Key: Costa Rica acc. wedge	Area: Eq Pac

Contact:

Dr. Eli A. Silver
Earth Sciences Department
University of California
Santa Cruz, CA 95064 (US)

Tel: 1 (408) 459-2266
FAX: 1 (408) 459-3074
Email: esilver@ucscc.UCSC.EDU

Objectives:

LRP: 8

Determination of mass balance and deformation of trench and accretionary prism off Costa Rica
- Determine material mass balance within accretionary prism
- Test equilibrium with incoming sediment and quantify offscraped, underplated shortened, subducted material
- Document trajectory of sediments in the prism
- Determine effects of fluids on prism deformation.

General area: Equatorial Pacific
Specific area: Middle America Trench and Costa Rica Accretionalry complex
Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
CR-1	09.64°N/086.20°W	4350	450	0	450	Lower plate reference (lithology, geochem., phys. prop.).
CR-2	09.73°N/086.12°W	3320	1850	0	1850	Age, strat., structure of apron and prism.
CR-3	09.79°N/086.06°W	2600	950	0	950	Age, strat., structure of apron and top of prism.
CR-4	09.81°N/086.00°W	2200	950	0	950	Age, strat., structure of slope apron in zone of extension.

Proposal acknowledged by JOIDES Office:	Sep 6, 1991	to:	Silver, E.A.
Proposal forwarded for review:	Sep 16, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Sep 16, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000630

Proposal Reference No.: 400----

Title: "Proposal to the Ocean Drilling Program for Determination of Mass Balance and Deformation Mechanisms of the Middle America Trench and Accretionary Complex off Costa Rica"

Proponents: E.A. Silver, T.H. Shipley and K.D. McIntosh

Abstract

We propose to determine the flow patterns, nature of the deformation mechanisms, and distributions of deformation and dewatering throughout an accretionary prism off Costa Rica. Impediments to such determinations in subduction environments have been the widespread presence of turbidites, with their uncertain and rapidly varying deposition rates, erosion of the accretionary wedge and lack of excellent deep structural imaging of forearcs. The Middle America Trench at Costa Rica has no turbidites, a thick sedimentary apron capping the accretionary prism, and excellent 2D and 3D seismic reflection data over a broad swath. We wish to utilize this fortunate setting and excellent seismic data by proposing four drilling sites to determine: (1) the material mass balance within the prism; (2) the partitioning of deformation into offscraped, underplated, internally shortened, and subducted material; (3) the trajectory of prism material; and (4) the effects of fluids on prism deformation.

000631

ODP Proposal Log Sheet 401----

Proposal received: Sep 5, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

Evolution of a Jurassic Seaway, Southeastern Gulf of Mexico

R.T. Buffler and G. Marton

Abbrev. Title: Evolution of a Jurassic Seaway, SE Gulf of Mexico	Key: Jurassic Golf of Mexico	Area: N Atl

Contact:

Dr. Richard T. Buffler
Institute for Geophysics
University of Texas at Austin
8701 Mopac Boulevard
Austin, TX 78759 (US)

Objectives:

LRP

1. Deformational processes at divergent plate margins 7
   - Continental rifting processes under oblique extension (transtensional margin evolution)
   - Age, nature, and distribution of pre-, syn-, post-rift sediments and unconformities
   - Vertical motion history, basin formation, and rift-drift evolution
   - Breakup history of Pangea – constrain models for early evolution of Gulf/Caribbean area
   - Asymmetric evolution of the Gulf of Mexico rift
2. Jurassic Paleoceanography 13
   - Paleoenvironment and evolution of seaways
   - Long-range changes in oceanic circulation, climate, flora/fauna
   - Effect of sea level history and tectonics on depositional systems and stratigraphy

General area: North Atlantic
Specific area: SE Gulf of Mexico
Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
SE-1	24°05.94'N/084°52.65'W	3450	1927	0	1927	Full pre-, syn-, post-rift sed. suite; unconformities; paleo.
SE-2	23°32.58'N/084°17.35'W	2812	1612	50	1662	L. Jurassic carbonate platform rocks; bsmt.; paleo.
SE-3	23°28.91'N/084°23.82'W	3127	1969	0	1969	Late syn-rift/post-rift clastic carb. sequence; breakup proc.
SE-4	23°23.35'N/084°33.24'W	2460	1794	0	1794	?Mesoz./?Paleoz. pre-rift rocks; test upper plate model.
SE-5	23°21.04'N/085°06.18'W	2625	1725	0	1725	As SE-4.
SE-6	23°51.31'N/085°23.97'W	3450	1584	0	1584	E. Cret. tectonic episode and related sed.; unconformities.

Proposal acknowledged by JOIDES Office:	Sep 6, 1991	to:	Buffler, R.T.
Proposal forwarded for review:	Sep 16, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Sep 16, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000632

Proposal Reference No.: 401----

Title: "Evolution of a Jurassic Seaway, Southeastern Gulf of Mexico"

Proponents: R.T. Buffler and G. Marton

Abstract

The southeastern Gulf of Mexico during the Jurassic was a complex rifted transform zone connecting the Gulf of Mexico ocean basin with the proto-Carribean ocean basin. It evolved as an important seaway during the breakup of Pangea as South America separated from North America. Movement along this zone accommodated oblique extensional strain between the Florida block and an independent Yucatan block and can be classified as a transtensional rifted margin. The area contains a thick Jurassic and older sedimentary section that is within reach of deep ODP drilling.

Six deep stratigraphic test sites are proposed to penetrate Jurassic and older rocks in the southeastern Gulf of Mexico. These sites are designed to address major global thematic problems as well as regional problems related to the early evolution of the Gulf/Caribbean region. Major themes include deformational processes at divergent plate margins and longer period changes in oceanic and atmospheric circulation and climate during the Jurassic (i.e., Jurassic paleoceanography and seaway evolution). More specific objectives related to deformational processes include: 1) continental rifting processes under oblique extension (transtensional margin evolution), 2) age, nature, and distribution of pre-rift, syn-rift, and post-rift sedimentary sequences and related unconformities, 3) vertical motion history, basin formation, and rift-drift evolution, 4) breakup history of Pangea - models for the early evolution of the Gulf/Caribbean region, and 5) asymmetric evolution of the Gulf of Mexico rift. Specific objectives related to Jurassic paleoceanography include: 1) paleoenvironment and evolution of seaways in the Gulf/Caribbean region, 2) long-range global changes in oceanic circulation, climate, flora/fauna, and 3) effect of sea level history and tectonics on depositional systems and stratigraphy. These sites will be an important link in a global array of deep Jurassic stratigraphic sites. Because of the area's proximity to a possible KT impact site in northern Yucatan, the drilling of possible impact deposits at the proposed sites is added as an additional important objective.

The proposed drilling represents only one aspect of a total integrated study of the region that will include the use of seismic and other geophysical data as well as outcrop studies of Cuba and southern Mexico.

000633

ODP Proposal Log Sheet 402----

Proposal received: Sep 9, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

The Geochemical Anomaly in MAR Basalts between 12°-18°N

A.V. Sobolev, L.V. Dmitriev and H. Bougault

Abbrev. Title: Geochemical anomaly in MAR basalts between 12°-18°N	Key: MAR basalts	Area: N Atl

Contact:

Dr. Alexander V. Sobolev
Vernadsky Institute of Geochemistry
USSR Academy of Science
Kosigin Str. 19
Moscow 117975 (USSR)

Objectives:

LRP: 2

Dynamics of mantle melting proc. and magma transport (inc. segreg., mixing), and mantle heterogeneity

- Short scale time var. of geochem. features of magmas at anomaly extremes between 12° and 18° MAR
- Accurate age of the anomaly in tectonically undisturbed region
- Dynamics of magma supply using incompatible elements as natural tracers

General area: North Atlantic

Specific area: Mid Atlantic Ridge, 12°-18°N

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
SITE 1	14.1°N/045.0°W	3000	0	300	300	Anomaly maximum, topographic high.
SITE 2	15°06'N/044°51'W	4500	0	300	300	Anomaly maximum, close to 15°20' FZ.
SITE 3	12°40'N/044.0°W	4500	0	300	300	Anomaly minimum.
SITE 4		0	0	0	0	On 10 Ma crust on 14.2°N.
SITE 5		0	0	0	0	Dependant on result of SITE 4.
SITE 6		0	0	0	0	Dependant on result of SITE 5.

Proposal acknowledged by JOIDES Office:	Sep 10, 1991	to: Sobolev, A.V.
Proposal forwarded for review:	Sep 16, 1991	to: LITHP, OHP, SGPP, TECP
Proposal copies:	Sep 16, 1991	to: JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:

000634

Proposal Reference No.: 402----

Title: "The Geochemical Anomaly in Mar Basalts Between 12°-18°N"

Proponents: A.V. Sobolev, L.V. Dmitriev and H. Bougault

Summary*

....The following problems are now in the center of interest of the geo-scientific community: The dynamics of the processes of mantle melting and magma transport, including melt segregation and mixing; and mantle heterogeneity, including both passive and active scenarios.

A possible way to contribute to the study of the dynamic phenomena of MORB formation is to use natural tracers which permit the identification of individual batches of magma both on the level of primary melts and their derivatives. The ideal tracers of this sort are incompatible elements in basalts from regions of steep concentration gradients in space and time. The ratios of these elements are not significantly affected by low pressure fractionation of magmas and thus reflect mantle source compositions and/or processes of magma extraction from the source as well as magma mixing processes. An accurate 3 dimensional picture of geochemical patterns of magmas at such regions including isotopic measurements can be extremely useful for developing quantitative models of processes in the system: mantle source-magma-chamber(s) - oceanic floor.

In order to successfully study the phenomena of mantle heterogeneity, it is necessary at least to understand the geochemical structure of these heterogeneities. This requires dense sampling and relatively regular structure of the geochemical object. However the structure of well-known strong geochemical anomalies along the Mid-Atlantic Ridge are rather complicated and irregular.

The geochemical anomaly between 12° and 18°N on the Mid-Atlantic Ridge meets all major criteria for the study of the problems listed above and is thus an excellent target for advanced study....

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000635

ODP Proposal Log Sheet 403----

Proposal received: Sep 9, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

Proposal to Drill the KT Boundary in the Gulf of Mexico

W. Alvarez, J. Smit, E.M. Shoemaker, A. Montanari and R.T. Buffler

Abbrev. Title: KT boundary in the Gulf of Mexico	Key: KT bound., G/Mexico	Area: N Atl

Contact:
Dr. Walter Alvarez
Department of Geology and Geophysics
University of California
Berkeley, CA 94720 (US)
Tel: 1 (415) 642-3993
FAX: 1 (415) 643-9980

Objectives:

LRP: X

To test wether buried circular structure at Chicxulub is K-T impact crater
- Redrill for full recovery in the area of previous sites 536 and 540
- Attempt to recover coarse ejecta close to Chicxulub crater
- Drill a radial transect across the Campeche Escarpment

General area: North Atlantic
Specific area: Gulf of Mexico
Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
GMKT-1	23°49.73'N/084°22.25'W	2926	350	0	350	Full strat. sequence drilled at Site 540.
GMKT-2	23°29.39'N/085°12.58'W	2790	100	0	100	Full strat. sequence drilled at Site 536.
GMKT-3	22°36'N/090°19'W	150	1200	0	1200	Sample KT ejecta blanket ~100km north of impact structure.
GMKT-4	22°59'N/090°38'W	900	855	0	855	Sample KT ejecta blanket ~150km north of impact structure.
GMKT-5	22°06'N/090°43'W	2740	555	0	555	Sample and date poss. KT erosional channeling and slump.
GMKT-6	23°09'N/090°46'W	3150	760	0	760	Sample and date possible KT slump blocks.

Proposal acknowledged by JOIDES Office:	Sep 10, 1991	to:	Alvarez, W.
Proposal forwarded for review:	Sep 16, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Sep 16, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000636

Proposal Reference No.: **403----**

Title: "Proposal to Drill the KT Boundary in the Gulf of Mexico"

Proponents: W. Alvarez, J. Smit, E.M. Shoemaker, A. Montanari and R.T. Buffler

Abstract

Six sites are proposed in the Gulf of Mexico to test whether the buried 180 km Chicxulub structure along the north coast of Yucatan is the large KT impact crater predicted by the hypothesis that impact caused the KT mass extinction. Two sites are located in the southeastern Gulf of Mexico at DSDP Sites 540 and 536, where KT impact deposits already have been interpreted. Four sites are located along a radial transect across the north margin of the Campeche Bank. Two sites are located along the outer bank and are designed to sample directly the proximal ejecta blanket approximately 100-150 km NNW of the structure. Two other sites are designed to sample possible impact-generated scars and slump blocks along the Campeche Escarpment. Sampling proximal deposits in the Gulf of Mexico near the major KT impact site has the potential for advancing significantly our understanding of the KT event as well as impact events in general.

000637

ODP Proposal Log Sheet 404----

Proposal received: Sep 11, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

Late Neogene Paleoceanography from Western North Atlantic Sediment Drifts

L.D. Keigwin and E.A. Boyle

Abbrev. Title: Neogene paleo. from W North Atlantic sediment drifts	Key: W. N. Atl. sed. drifts	Area: N Atl

Contact:

Dr. Lloyd D. Keigwin
Woods Hole Oceanographic Institution
Woods Hole, MA 02543 (US)

Objectives:

LRP: 12/13; X

1. Late Neogene paleoceanography on suborbital timescales from high sedimentation rates in sediment drifts
   - How persistent are millenial scale oscillation observed (carbonate, oxigen/carbon isotopes, trace metal)?
   - Are these oscillation truly cyclic?
   - How are oscillations linked to the history of northern hemisphere glaciation?
2. Other, related studies:
   - Processes involved in drift sedimentation, including sediment wave migration
   - Detailed studies of secular variation of the Earth's magnetic field and of changes during magnetic reversals
   - Relationship between geotechnical properties and seismic stratigraphy
   - Study of gas hydrates
   - Paleoceanography of earlier Neogene and possibly Paleogene on flanks of Blake Ridge
   - Structure of Pleistocene and late Pliocene oxygen and carbon isotope Milankovitch cycles in N. Atlantic

General area: North Atlantic

Specific area: Bermuda Rise, Bahama Outer Ridge, Blake Outer Ridge

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
BR-1	33°41.2'N/057°36.9'W	4500	300	0	300	High-resol. record; onset of acoustically laminated sed.
BBOR-1	28°14.7N/074°26.4'W	4760	100	0	100	High resol. record; sed. wave migration; deepest hemipel.
BBOR-2	28°15.0'N/074°09.0'W	4500	300	0	300	High-resol. record.
BBOR-3	28°15.0'N/074°04.0'W	4250	150	0	150	High-resol. record.
BBOR-4	29°18.5'N/073°11.0'W	4000	250	0	200	High-resol. record; deepest Blake Ridge site.
BBOR-5	30°39.8'N/074°14.5'W	3500	250	0	250	High-resol. record.
BBOR-6	31°40.0'N/075°16.5'W	3000	250	0	250	High-resol. record.
BBOR-7	32°04.5N/076°28.0'W	2500	250	0	250	High-resol. record.
BBOR-8	32°31.5'N/076°35.0'W	2250	250	0	250	High resol. record; shollowest site of transect.

Proposal acknowledged by JOIDES Office:	Sep 11, 1991	to:	Keigwin, L.D.
Proposal forwarded for review:	Sep 16, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Sep 16, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000638

Proposal Reference No.: 404----

Title: "Late Neogene Paleoceanography from Western North Atlantic Sediment Drifts"

Proponents: L.D. Keigwin and E.A. Boyle

Abstract

We propose APC/XCB coring for paleoenvironmental purposes the late Neogene hemipelagic sediments which are deposited at accelerated rates on western North Atlantic sediment drifts. Deposits on the northeastern Bermuda Rise (4500 m) accumulate at rates between 20 and 200 cm/kyr and contain one of the highest-resolution records of surface and deep oceanographic change from the world ocean. Available evidence indicates that surface ocean temperature and salinity, terrigenous sediment flux from high northern latitudes and deep ocean circulation vary on the millenial scale and are related. Because of the very high deposition rates, records longer than about 80 kyr can only be recovered by ODP. Longer cores are needed to understand the ocean-climate system at high resolution on Milankovitch (orbital) timescales and to trace the evolution of this system since the inception of northern hemisphere glaciation.

Results from the Bermuda Rise, which are available from only one water depth, need to be confirmed at a deep, high-deposition rate location elsewhere in the western North Atlantic. Furthermore, late Neogene oceanographic change in the western North Atlantic needs to be documented for millenial as well as Milankovitch timescales for the entire deep and intermediate water column. These goals can best be achieved by APC/XCB coring of a depth transect of 8 sites on the Blake and Bahama Outer Ridges, the first such ODP transect in the North Atlantic. There it will be possible to monitor the history of North Atlantic Deep Water production, glacial intermediate water production, and changing sediment fluxes with depth.

Four holes will be required at many of the proposed sites to ensure complete stratigraphic sections and to dedicate one core at each site for paleochemistry studies. This is necessary because the high terrigenous flux reduces the relative abundance of benthic foraminifera, and it will require waiving ODP sampling restrictions on that core. Coring will be limited to 250 m sub-bottom in the Blake-Bahama region because of the prevalence of gas hydrates at greater depths.

000639

ODP Proposal Log Sheet **405----**

Proposal received: Sep 12, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

Amazon Deep-Sea Fan Growth Pattern: Relationship to Equatorial Climate Change, Continental Denudation and Sea-Level Fluctuations

R.D. Flood, C. Pirmez, W. Showers, J.E. Damuth, P.L. Manley, R.O. Kowsmann and D. Peteet

Abbrev. Title: Amazon fan growth and climate, denudation, sea-level	Key: Amazone fan	Area: Eq Atl

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Objectives:

LRP: 14/12

Amazone deep-sea fan and equatorial climate change, continental denudation and sea level change.

- Stratigraphy and dating of major fan units.
- Lithology and facies of key acoustic fan units; external (sea level) and internal (channel avulsion) controls.
- Record of land climate during lowstands, from proximal levee sed. (at least several glacials cycles).
- Record of western eq. Atl. surface circulation patterns, from distal levee sed. and condensed sequences.
- Overall response of eq. Atl. to glacial-interglacial and other cycles in climate, sea level, perhaps tectonics.

General area: Equatorial Atlantic

Specific area: Amazon deep-sea fan

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
AF-1	05°37.6'N/047°45.1'W	3570	625	0	625	Channel-levee systems; ?debris flows; deeply buried syst.
AF-2	05°38.0'N/047°36.4'W	3600	170	0	170	Up. levee complex; reflector; ?debris flow; buried systems.
AF-3	05°56.1'N/047°45.3'W	3685	180	0	180	Overbank sed. Brown, Ch.1 systems; reflector; ?debris flow.
AF-4	05°21.4'N/047°49.1'W	3450	160	0	160	Levee sed. Ch.1, Ch.2A; deeper levees; d. flow near Ch.1.
AF-5	05°22.5'N/048°01.5'W	3390	280	0	280	Debris flow and underlying systems, condensed sections.
AF-6	05°08.6'N/047°31.4'W	3180	250	0	250	Overbank sed. Ch. 1; sample early diagenetic gasses.
AF-7	04°37.3'N/047°15.2'W	3180	250	0	250	Overbank sed. Blue, Yellow, Ch.6; layers beneath Ch.6.
AF-8	05°14.4'N/047°09.3'W	3520	175	0	175	Overbank sed. Ch. 6C; Blue, base of 6C and underlying.
AF-9	05°11.3'N/046°55.5'W	3410	350	0	350	Overbank sed. Yellow, Ch. 6, underl. levee, condensed sect.
AF-10	05°08.6'N/046°38.3'W	3500	150	0	150	Overbank system 5 and underlying system.
AF-11	05°13.1'N/047°03.4'W	3460	125	0	125	Overbank system 6B.
AF-12	04°44'N/47°30'W	2790	30	0	30	Acoustic facies of active Ch. 1; early diagenetic gasses.
AF-13	06°02'N/047°42'W	3780	30	0	30	Sed. overl. Brown system for potential planctonic record.
AF-14	05°25.4'N/047°29.5'W	3475	50	0	50	Sed. overl. Aqua system for planctonic record.
AF-15	05°29.1'N/047°40.8'W	3415	50	0	50	Sed. in cutoff channel meander; organics, diagenetic gasses.
AF-16	04°38.4'N/047°40.8'W	2780	50	0	50	Sed. overlying Blue system.
AF-17	04°35.2'N/047°11.4'W	2780	50	0	50	Sed. overlying Yellow system.
AF-18	05°08.4'N/046°36.2'W	3475	40	0	40	Sed. overlying system 6C.

Proposal acknowledged by JOIDES Office:	Sep 12, 1991	to: Flood, R.D.
Proposal forwarded for review:	Sep 16, 1991	to: LITHP, OHP, SGPP, TECP
Proposal copies:	Sep 16, 1991	to: JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:

000640

Proposal Reference No.: **405----**

Title: "Amazon Deep-Sea Fan Growth Pattern: Relationship to Equatorial Climate Change, Continental Denudation and Sea-Level Fluctuations"

Proponents: R.D. Flood, C. Pirmez, W. Showers, J.E. Damuth, P.L. Manley, R.O. Kowsmann and D. Peteet

Abstract

During low sea-level stands, the Amazon River discharged its sediment load directly into the deep-sea to build the Amazon fan. The fan itself is built of a series of distinctive seismic units that are typical of many mud-rich fans. These units include channel-levee systems, composed of a reflective channel and associated, less-reflective overbank deposits, that thin downfan to the reflective lower fan, and large, transparent debris flows. The units stack and overlap to build the fan that, for Amazon fan, has been active since mid-Miocene. Although the structure of this and other muddy modern fans is often displayed on seismic profiles, the lithologies and ages of the sediments that make up these units, and the relationships between these units and sea-level change, are poorly defined. In order to resolve these questions, we propose to sample several of the acoustic units to determine their lithologies, facies and ages. Since fan sediments are river-derived, analysis of the sediments deposited in the channel levees (e.g., pollen, clay and sand mineralogy, organic matter) should reveal a high-resolution record of land climate during several glacial-interglacial cycles. In addition, Amazon fan underlies the western Equatorial Atlantic, and work to date suggests that high-quality planktonic records can be obtained from fan sediments when proper care is given to sample placement. In particular, cores recovered from the elevated flanks and crests of abandoned levees, especially when shielded from the active levee system, contain high sedimentation-rate records apparently free from downslope flows. These sediments appears to contain a record of surface circulation through the mapping of river-discharge patterns. Temporal changes in river discharge patterns suggests that surface circulation patterns change on a time scale of several thousand years. The integrated analysis of fan architecture and growth pattern, land climate as recorded in fan sediments, and paleocirculation patterns in the western Equatorial Atlantic will allow us to more fully understand the response of this important equatorial region to glacial-interglacial and other climate cycles and to tectonic influences such as Andean uplift.

000641

ODP Proposal Log Sheet **406----**

Proposal received: Sep 16, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

North Atlantic Climatic Variability: Sub-Orbital, Orbital, and Super-Orbital Time Scales

W. Broecker, G. Bond, D. Oppo, S. Lehmann, M. Raymo and T. van Weering

Abbrev. Title: North Atlantic climatic variability	Key: N Atl. climatic var.	Area: N Atl

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Objectives:

LRP: 12, 16

1. North Atlantic climatic variability from long high-sedimentation rate cores (1-3 Ma).
   - Sub-orbital scale
     - how widespread are Heinrich layers and apparent Dansgaard-Oeschger equivalents found at DSDP 609?
     - evidence for strong surface-deep water link on sub-orbital scales prior to stage 3/during earlier deglac.?
     - evidence of Younger Dryas-type oscillations during periods of ice growth?
     - does UNADW production vary on sub-orbital scales? does it vary strictly out-of-phase with LNADW?
   - Orbital and super-orbital deep water variability.
     - new northern component endmember records
     - new cores from deep western Atlantic
     - Plio-Pleistocene deep water evolution
     - post-Oligocene deep water evolution
2. Paleontological and evolutionary investigations.

General area: North Atlantic

Specific area: Northwestern Atlantic, Feni Drift and Hatton Bank/Rockall Plateau

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
NWA-1	48°00'N/045°03'W	2183	300	0	300	Mid-depth ocean circulation; surface-deep water link.
NWA-2	41°31'N/045°08'W	4585	300	0	300	As NWA-1.
FD-1	55°30'N/014°42'W	2157	300	0	300	Mid-depth nutrient variability; surface-deep water link.
FD-2	55°19'N/014°56'W	2223	300	0	300	Alternate to FD-1.
FD-3	54°48'N/014°46'W	2635	300	0	300	Deep water circulation; surface-deep water link.
HB-1	54°24'N/018°44'W	1326	300	0	300	New N. comp. endmember; intermed. water nutrient var.

Proposal acknowledged by JOIDES Office:	Sep 16, 1991	to:	Oppo, D.
Proposal forwarded for review:	Sep 16, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Sep 16, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000642

Proposal Reference No.: 406----

Title: "North Atlantic Climatic Variability: Sub-Orbital, Orbital, and Super-Orbital Time Scales" A Proposal to Drill in the North Atlantic

Proponents: W. Broecker, G. Bond, D. Oppo, S. Lehman, M. Raymo and T. van Weering

Abstract

Here, we propose to drill at six sites in the North Atlantic (including one alternate site) in order to address several questions relating to climatic variability on a range of time scales. As a result of recent investigations on high sedimentation rate marine cores, it is evident that rapid oscillations such as those observed in temperature and dustiness in Greenland ice cores (Dansgaard-Oeshger events) also exist in the marine record. They can be seen as changes in surface fauna (sea surface temperature), carbonate, color, and deep ocean chemistry. One of the primary goals of this drilling proposal is to retrieve long high-sedimentation rate cores to determine whether these oscillations have characterized the marine record through the changing climatic regimes of the past 3 million years, and also to study the geographic distribution of these events. Also found in the marine record are events with longer characteristic repeat times (~10,000 years), which we believe are related to surges from the eastern Laurentian ice sheet. We would like to investigate the geographic distribution of these Heinrich events and determine whether they characterize the longer record. By also studying deep-water variability on sub-orbital time scales, and relating observations from surface water, deep water, and ice cores to each other, we anticipate that we will be in a better position to understand the forcing and dynamics of sub-orbital scale variability.

Using carbon isotopes from some of the same high sedimentation rate sites and from additional sites, we propose to study Upper and Lower North Atlantic Deep Water (UNADW and LNADW, respectively) on orbital and super-orbital time scales. For example, we propose one shallow North Atlantic site that will provide a better endmember for UNADW variability, and in conjunction with new records from our other proposed sites, will also provide the opportunity to examine vertical nutrient redistribution on several time scales. These new records will provide additional constraints on thermohaline circulation during key climatic intervals.

000643

ODP Proposal Log Sheet 407----

Proposal received: Sep 16, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

Offset Drilling in the North Atlantic Shallow Mantle at a Geochemical Anomaly

H.J.B. Dick, L. Dmitriev, H. Bougault, G. Thompson, M. Tivey, P. Kelemen, J. Casey, S. Silantiev

Abbrev. Title: North Atlantic shallow mantle at geochemical anomaly	Key: 15°20'N shallow mantle	Area: N Atl

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Objectives: LRP

1. Drilling exposed petrologic transition zone (dunites) between crust and mantle, and shallow mantle. 1/2
   - Drill into mantle plumbing system feeding the crustal magmatic system at a slow spreading ridge.
   - Shallow chemical and structural stratigraphy of the crust mantle transition zone.
   - Comparison to similar zones seen at the crust mantle transition in ophiolites.
   - Extent and effects of shallow mantle melt-rock interaction as a melt-modifying process in MORB evol.
   - Extent of lateral heterogeneity of mantle due to shallow melt migration processes.
2. Drill through and sample fluids and rocks from a mantle section undergoing active hydrothermal alteration. 10
   - Size, shape, geometry, geology and tectonic settings of the vent field and underlying plumbing system.
   - Nature, origin, history of precipitates and altered wall rocks near to, through, and far from fault zone.
   - To understand mineral zonation and evol. in hydro. system using theoretical calc. coupled with field obs.
   - Chemical exchanges during rock-seawater interactions at deep levels in the crust, and with mantle rocks.
   - Estimate significance of these deposits in global geochemical budgets and cycles.

General area: North Atlantic

Specific area: 15°20'N Fracture Zone, Mid Atlantic Ridge

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
FT-1	15°05'N/044°W	2400	0	500	500	Shallow mantle strat. at geochem. anomaly at mid-segment.
FT-2	15°N/44°W	3700	0	500	500	Shallow mantle strat. at geochem. anomaly at end of segm.
FT-3	15°20'N	3400	0	500	500	Hanging/foot wall of master fault controlling hydro. upwell.

Proposal acknowledged by JOIDES Office: Sep 16, 1991 to: Dick, H.J.B.
Proposal forwarded for review: Sep 16, 1991 to: LITHP, OHP, SGPP, TECP
Proposal copies: Sep 16, 1991 to: JOI, SO, SSDB
Proposal forwarded to DPG: 00/00/00 to:

000644

Proposal Reference No.: 407----

Title: "Offset Drilling in the North Atlantic Shallow Mantle at a Geochemical Anomaly"

Proponents: H.J.B. Dick, L. Dmitriev, H. Bougault, G. Thompson, M. Tivey, P. Kelemen, J. Casey, S. Silantiev and A. Sobolev

Summary*

....This proposal is for drilling in an extensive area of shallow mantle exposed by detachment faulting at the eastern intersection of the Mid-Atlantic Ridge with the 15°20' Fracture Zone. This region presents a unique opportunity for shallow mantle region for three major reasons:

1) It exposes the only large belt of dunites yet found in mantle outcrops in the oceans. These dunites are the products of melt rock interaction during shallow melt migration out of the mantle to the crust and represent the first documented exposure of the petrologic transition zone between crust and mantle. Drilling into these dunites provide us with the unique opportunity to document the stratigraphy of this critical region, and thus to constrain the early evolution of MORB and the nature of primary melts beneath ocean ridges.

2) Harzburgites dredged from this region reflect extremely high degrees of mantle melting and are spatially associated with geochemically "enriched" MORB with elevated $K2O/TiO2$, Sr and Pb isotopic ratios, and LREE enrichment similar to peridotites and basalts dredged at other geochemically anomalous regions of the mid-ocean ridges. Thus, the site directly addresses the need for drilling a shallow mantle section at a geochemical anomaly as addressed in detail in the JOI/USSAC workshop report on Deep Crustal Drilling.

3) Dredging at the foot of a scarp on the inside corner high has recovered hydrothermally cemented peridotite breccias, blue mud, aragonite-chrysotile spherulites and concretions which identify the locus of a hydrothermal upwelling zone. This provides the opportunity to drill through and sample fluids and rocks from a mantle section undergoing active hydrothermal alteration, representing an end-member for crustal alteration and fluid exchange in slow-spreading ocean crust....

....We propose three separate re-entry drill sites, each 500 m deep. Two of these would start on bare-rock exposures of the mantle, one in the dunites (FT-1), one in the harzburgites (FT-2), while a third (FT-3) would start in the hydrothermally cemented breccias dredged at the base of the fault scarp at the inside-corner high....

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000645

ODP Proposal Log Sheet 408----

Proposal received: Sep 16, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

Northern Nicaragua Rise Drilling Proposal: Testing Two New Interpretations

A.W. Droxler, A.C. Hine, P. Hallock, R. Buffler, E. Rosencrantz and A. Mascle

Abbrev. Title: Testing two new interpretations, N Nicaragua Rise	Key: N Nicaragua Rise	Area: N Atl

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Objectives:

LRP 12/14

Neogene evolution of carbonate platforms (northern Nicaraguan Rise: NNR).

- Influence of strong tectonic activity, primarily motion along 1200 km strike-slip.
- Influence of NNR carbonate platform and tectonic regime on development of Caribbean Current.
- Influence of Caribbean Current on carbonate production and accretion.
- Influence of glacial/interglacial paleoclimatic fluctuations on carbonate production/platform accretion.

General area: North Atlantic

Specific area: N Nicaraguan Rise

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
NNR-1A		0	0	0	0	
NNR-1B		0	0	0	0	
NNR-2		0	0	0	0	
NNR-3		0	0	0	0	
NNR-4A		0	0	0	0	
NNR-4B		0	0	0	0	
NNR-5		0	0	0	0	
NNR-6		0	0	0	0	
NNR-7		0	0	0	0	
NNR-8		0	0	0	0	
NNR-9		0	0	0	0	
NNR-10		0	0	0	0	

Proposal acknowledged by JOIDES Office: Sep 16, 1991 to: Droxler, A.W.
Proposal forwarded for review: Sep 16, 1991 to: LITHP, OHP, SGPP, TECP
Proposal copies: Sep 16, 1991 to: JOI, SO, SSDB
Proposal forwarded to DPG: 00/00/00 to:

000646

Proposal Reference No.: 408----

Title: "Northern Nicaragua Rise Drilling Proposal: Testing Two New Interpretations: (1) Neogene Segmentation of a Carbonate Megaplatform by Strike-Slip and Related Extensional Tectonics; (2) Its Role as a Paleogateway for the Neogene Initiation and Strengthening of the Caribbean Current"

Proponents: A.W. Droxler, A.C. Hine, P. Hallock, R. Buffler, E. Rosencrantz and A. Mascle

Summary*

....Recent research in several carbonate systems has demonstrated clearly that modern banks and basins have undergone a rapid and complex evolution in the Neogene. The resulting geologic environment does not reflect the physiography of preceding Paleogene platforms. Using carefully positioned drill sites within high quality, high resolution seismic grids, Neogene evolution has been studied in the Bahamas, the Maldives, and along the northeastern Australian margin. We are proposing a drilling program on the Northern Nicaragua Rise (NNR) to study the Neogene evolution of a shallow carbonate system that has developed since the Eocene along the northern boundary of the Caribbean plate. The NNR is unique in many ways and its study could provide insight into four important areas:

1. Neogene evolution of a carbonate system influenced by strong tectonic activity, primarily associated with the 1,200 km strike-slip motion that has occurred along the Caribbean/North American plate boundary since the Eocene;
2. the influence of the NNR carbonate platforms and tectonic regime on the development of the Caribbean Current as a western boundary current;
3. the influence of the Caribbean Current on carbonate production and accretion, in particular, turn-on/turn-off of coral-reefal and sponge-algal biohermal development; and
4. the influence of glacial/interglacial paleoclimatic fluctuations on carbonate production and platform accretion and on the role offbank transport of carbonate sediments plays in oceanic carbonate budgets....

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000647

ODP Proposal Log Sheet 409----

Proposal received: Oct 4, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *Other*

High Resolution Late Quaternary Paleoclimatic and Sedimentary Record, Santa Barbara Basin, California

J.P. Kennett

Abbrev. Title: Late Quaternary paleo., Santa Barbara Basin	Key: Santa Barbara Basin	Area: N Pac

Contact:

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Objectives:

LRP

12/15

High-resolution Late Qaternary paleoclimatic and sedimentary record.

General area: North Pacific

Specific area: Santa Barbara Basin

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
[NSBB-1]	34°16'N/120°04'W	500	200	0	200	

Proposal acknowledged by JOIDES Office:	Nov 6, 1991	to:	Kennett, J.P.
Proposal forwarded for review:	00/00/00	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	00/00/00	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000648

Proposal Reference No.: 409----

Title: "High Resolution Late Quaternary Paleoclimatic and Sedimentary Record, Santa Barbara Basin, California"

Proponents: J.P. Kennett

Summary

This is a proposal for double APC coring of the upper 200 m of sediments in the Santa Barbara Basin, California. Such a concept was previously included in a package of sites proposed for the Californian margin area by Lyle et al. (386/E). The middle to late Neogene sediments of the Santa Barbara Basin and adjacent areas were deposited at moderately high sedimentation rates in dysaerobic/anoxic conditions and contain diatoms, radiolorians, foraminifera and pollen in sufficient abundance, providing an important opportunity for high resolution paleoclimatic/paleoceanographic investigations in the Quaternary. Stable isotopic, geochemical and micropaleontological studies will be of considerable value in providing critical information within the context of global climatic change and the role of the ocean in the global carbon cycle. The site should provide a maximum of data relative to a minimum use of drill-ship time.

000649

ODP Proposal Log Sheet **361-Add**

Proposal received: Oct 25, 1991

☐ *New proposal* ☐ *Revised proposal* ☒ **Addendum to proposal** ☐ *Other*

Site Survey, TAG Hydrothermal Field, MAR 26°N

G. Thompson

Abbrev. Title: Site survey, TAG hydrothermal field, MAR 26°N	Key: TAG hydro.	Area: N Atl

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Objectives: Site survey proposal.

LRP

General area: North Atlantic
Specific area: TAG hydrothermal mound, Mid-Atlantic Ridge
Proposed Sites: See 361-Rev.

Site Name	Position	Water depth	Penetration Sed Bsmt Total	Brief site-specific objectives

Proposal acknowledged by JOIDES Office: Nov 7, 1991 to: Thompson, G.
Proposal forwarded for review: 00/00/00 to: LITHP, OHP, SGPP, TECP
Proposal copies: 00/00/00 to: JOI, SO, SSDB
Proposal forwarded to DPG: 00/00/00 to:

000650

Proposal Reference No.: **361-Add**

Title: "Site Survey, TAG Hydrothermal Field, MAR 26°N"

Proponents: G. Thompson

Summary*

....Ridge crest hydrothermal systems play a fundamental role in transferring a large fraction of the heat from the earth's interior to its surface. Through thermally-induced flow of seawater in fractures and fissures in the permeable portion of the crust and upper mantle, much of the mantle-derived thermal energy is dissipated into the lithosphere, hydrosphere, and biosphere along the global mid-ocean ridges. This circulation gives rise to a complex series of physical, chemical and biological interactions that affect the composition of seawater, and lead to the creation of many types of seafloor ore deposits, and to the existence of unusual biological communities.

Understanding the configuration, chemistry and dynamics of hydrothermal systems was identified as one of the top priority objectives at both COSOD I and II (Conference On Scientific Ocean Drilling), and was recognized as a primary requirement to accomplish the broad goals of the RIDGE initiative. Furthermore, in its Long-Range Plan, the Ocean Drilling Program (ODP) has emphasized hydrothermal circulation as an important process to study by drilling. The need to understand the structure, geology and tectonics of hydrothermal fields and their temporal variation, the dynamics and physical characteristics of flow in these systems, and to test ophiolite-based models of circulation and mineralization is of pressing urgency.

Although a considerable amount of surficial sampling has been completed on a number of ridge hydrothermal systems, many questions remain that can be answered only by drilling an active system on a mid-ocean ridge. Hydrothermal systems on unsedimented ridge axes dominate global hydrothermal activity, and hence are a major contributor to global mass and energy fluxes. Until now, a major focus of ODP has been to drill sedimented ridge hydrothermal systems where large deposits have been or are developing. It has been emphasized (e.g., by the Sedimented Ridges Working Group), however, that they represent special cases, and there is a need to drill a large volcanic-hosted deposit. It is from the interior of such mature deposits that we will be able to study the processes of recrystallization and "zone-refining", the distribution of minerals, the hydrothermal circulation and plumbing, the nature of the root zone, and the processes occurring during ore formation and deposition....

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

"Dr. Austin, may I be excused? My brain is full."