PCOM Summer Meeting
Scripps Institution of Oceanography
LaJolla, California

14-16 August 1990
Agenda

Page Number
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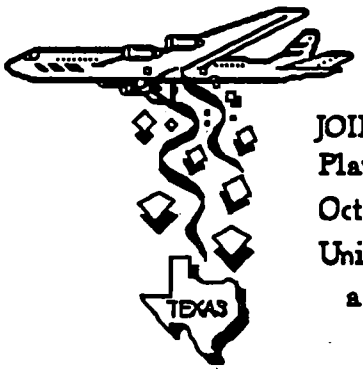
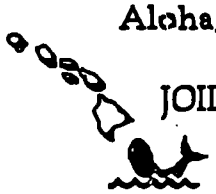
Additional Attachments



JOIDES
Planning Office
October 1, 1990
University of Texas
at Austin

Aloha,



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JOIDES RESOLUTION OPERATIONS SCHEDULE

Schedule Prepared and Presented During Paris PCOM

LEG	AREA	DEPARTURE LOCATION	DEPARTURE DATE	ARRIVAL LOCATION	ARRIVAL DATE	IN PORT	DAYS AT SEA*
135	Lau Basin	Suva, Fiji	12/22/90	Suva, Fiji	02/12/91	02/12 - 02/13	~~56~~
136	Transit	Suva, Fiji	02/14/91	Honolulu	02/24/91	02/25 - 02/27	11
	OSN-1	Honolulu	02/28/91	Honolulu	03/13/91	03/13 (1/2 day)	14
	Engineering 3A (504B)	Honolulu	03/14/91	Panama	04/15/91	04/15 - 04/19	32
137	E. Equat. Pac. Neogene	Panama	04/20/91	San Diego	06/19/91	06/19 - 06/23	60
138	Sedimented Ridges 1	San Diego	06/24/91	Victoria, B.C.	08/25/91	08/25 - 08/30	63
139	504B or EPR-1	Victoria, B.C.	08/31/91	Panama	10/30/91	10/30 - 11/04	60

Science Operator Schedule of 4 May 1990

LEG	AREA	DEPARTURE LOCATION	DEPARTURE DATE	ARRIVAL LOCATION	ARRIVAL DATE	IN PORT	DAYS AT SEA*
133	N.E. Australia	Guam	08/10/90	Townsville, Australia	10/11/90	10/11 - 10/15	62
134	Vanuatu	Townsville, Australia	10/16/90	Suva, Fiji	12/17/90	12/17 - 12/21	62
135	Lau Basin	Suva, Fiji	12/22/90	Suva, Fiji	02/18/91	02/18	58
136	Transit	Suva, Fiji	02/19/91	Honolulu	03/01/91	03/01 - 03/03	10
	OSN-1	Honolulu	03/04/91	Honolulu	03/18/91	03/18 (1/2 day)	14
	Engineering 3A (504B)	Honolulu	03/18/91 3/19/91	Panama	04/21/91 4/20/91	04/22 - 04/26	34
137	E. Equat. Pac. Neogene	Panama	04/27/91	San Diego	06/26/91	06/26 - 06/30	60
138	Sedimented Ridges 1	San Diego	07/01/91	Victoria, B.C.	09/02/91	09/02 - 09/06	63
139	504B or EPR-1	Victoria, B.C.	09/07/91	Panama	11/06/91	11/06 - 11/10	60

JOIDES MEETING SCHEDULE (07/25/90)

Date	Place	Committee/Panel
11-12 June, 1990	Iceland	PPSP
20-22 June, 1990	Washington, DC	EXCOM & ODP Council
28-29 June, 1990	Seattle, WA	DMP
10-11 July, 1990	Palisades, NY	SSP
9-10 August, 1990	College Station, TX	PPSP
9-11 August, 1990	Olympic Peninsula, WA	Cascadia DPG
14-16 August, 1990	LaJolla, CA	PCOM
17-18 September, 1990	Sidney, BC	PPSP
26 September, 1990	College Station, TX	Deep Drilling WG
27-28 September, 1990	College Station, TX	TEDCOM
2-3 October, 1990	Villefranche, France	EXCOM
8-10 October, 1990	Basel, Switzerland	IHP
9-12 October, 1990	Townsville, Australia	SMP
11-13 October, 1990	Townsville, Australia	DMP
11-13 October, 1990*	Tokyo, Japan	LITHP
19-21 October, 1990*	Canberra, Australia	OHP
1-3 November, 1990*	Paris, France	TECP
2-3 November, 1990	Paris, France	SGPP
27 November, 1990	Kona, Hawaii	Panel Chairmen
28 Nov.-1Dec.,1990	Kona, Hawaii	PCOM
5-6 March, 1991*	College Station, TX	SMP
23-25 April,1991*	Narragansett, RI	PCOM
June, 1991*	Cardiff, Wales	ex-IOP & Co-Chiefs
20-22 August,1991*	Hannover, FRG	PCOM
22-23 October, 1991*	Halifax, Nova Scotia	SMP
3 December, 1991*	Austin, TX	Panel Chairmen
4-7 December, 1991*	Austin, TX	PCOM

* Tentative meeting; or not yet formally requested and/or approved.

PCOM Summer Meeting
Scripps Institution of Oceanography
LaJolla, California

14-16 August 1990

Agenda Notes

0900 Tuesday 14 August 1990

A Introduction

Welcome, and comments about meeting logistics (J. Natland).

Introduction of PCOM members, liaisons, and guests.

B Approval of Minutes of 24-26 April 1990 PCOM Meeting at Société Géologique de France, Paris.

The attached revised draft minutes include corrections received at the JOIDES Office through 26 July.

Call for additional corrections or additions; call for approval.

C Approval of Agenda

The purposes of this Summer Meeting are to prepare for the Annual Meeting, confer with liaison groups to other international global geoscience initiatives, and conduct routine JOIDES business. We will also hear reports on strategy for renewal and on engineering developments, and act on them as necessary

D ODP Status Reports by Liaisons to PCOM

NSF (B. Malfait)

JOI (T. Pyle)

Science Operator (T. Francis) (except engineering details)

Wireline Logging (R. Jarrard or R. Anderson)

Break 1000-1015 Coffee

E JOIDES Status Reports by PCOM Liaisons

EXCOM (R. Moberly) The Executive Committee met with the ODP Council in Washington on 20-22. June. EXCOM and the ODPC discussed the perspective and scheduling for renewal, going country by country much as PCOM did in Paris. In summary little had changed since fall of 1989. Most timing seems about right, even though fiscal years and decision points may vary from country to country. Everyone has some worry about competing programs and global initiatives, but most are optimistic if there is not a major increase in required funds. Reports by JOI, BCOM, PCOM, Wireline Services, and the Science Operator were well received. EXCOM noted "with approval the successful efforts of all concerned in bringing the publication of Initial Reports and Scientific Results on to schedule".

[Later in this meeting, J. Austin and M. Leinen can give their evaluations of the meeting relative to renewal, and the JOI Board of Governors letter to Eric Bloch can be discussed.]

Interest by members of EXCOM and the ODPC to visit or participate in the short leg off Hawaii in late February or visit the *JOIDES Resolution* in port in San Diego in late June requires a firm schedule well in advance of those times. The 1991 joint EXCOM-ODPC meeting is to coincide with the San Diego port call. PCOM and the Science Operator must set the dates of the Honolulu and San Diego port calls at this PCOM meeting so that EXCOM and ODPC can be informed by 1 September. The most recent schedule based on what PCOM has approved for drilling, and that L. Garrison distributed in Paris, listed 25-27 February in Honolulu and 19-23 June in San Diego. Garrison in early May, however, revised those dates but Moberly objected to the delay, which had not been discussed before PCOM. We must decide at this meeting what if anything is to be added to the legs, but an appropriate place on the agenda is after hearing other reports.

SMP (M. Leinen) Although we heard a report in April of SMP's 20-21 March meeting, we did not have the SMP minutes and therefore did not act on their recommendation to allow no radioactive or enriched stable isotope solutions on board *JOIDES Resolution*. We should define our policy on isotopes, and there may be other issues PCOM members want to raise regarding SMP's previous meeting (draft minutes attached)..

PPSP (R. Moberly, June; J. Austin, August) The Pollution Prevention and Safety Panel met in Reykjavik, Iceland, on 11-12 June. Its draft minutes are attached. For Leg 135, Lau Basin-Tonga Arc, three sites were approved, one provisionally approved, and two disapproved; the latter three were to be reconsidered if additional information would be presented at a 9-10 August meeting at College Station. PPSP also discussed the need to include consideration of possible high-temperature hazards in some upcoming legs, and discussed again possible clathrate drilling and shipboard monitoring, the safety of drilling the Northeast Australian Margin, and the Exmouth Plateau post-mortem. With respect to the last topic, PPSP emphasized that all proposed drill sites of all legs will be considered on a case-by-case basis, and that the decision to allow the twinning of an industry site, with hydrocarbon shows, on the Exmouth Plateau, should in no way be construed as setting a direct precedent to be extrapolated to other drilling proposals. The 9-10 August meeting will have been after this agenda briefing book is mailed.

DMP (D. Cowan) The Downhole Measurements Panel met 28-29 June in Seattle. Its draft minutes are attached. DMP learned about experiences on the Nankai leg, reviewed downhole-measurement plans for possible Pacific legs, and assessed the status of the high-temperature logging initiative. DMP recommends a review of previous drilling difficulties in Barbados and Nankai, an approach to JAPEX about the availability of JAPEX high-temperature logging tools, an open-hole logging program of the Oahu test hole and a test of a borehole seal there, a TECP liaison to DMP, and a representative of DMP or LDGO at DPG meetings to provide help on the nature and scheduling of downhole measurements.

SSP (J. Watkins) The Site Survey panel met 12-13 July at Lamont. Its draft minutes are attached. SSP updated its assessment of Pacific programs and organized its future work for Atlantic programs. SSP reported concerns with weather- and current-related oceanographic problems at sites and lack of SSP liaisons to DPGs. Important specific comments concern Chile Triple Junction, Cascadia Margins, North Pacific Transect, OSN Pilot Hole, Hess Deep, and Peru Gas Hydrates.

Cascadia DPG (M. Langseth) This DPG will have met 9-11 August, after this agenda briefing book was mailed. L. Cathles states that the DPG report will be available in time for late-August inclusion in

the FY1992 Pacific Prospectus that will be mailed then to all thematic panel members, panel chairs, PCOM members, and liaisons.

Lunch 1200-1300

F Report of Co-Chairs of Liaison Groups

FDSN (A. Dziewonski; M. Purdy)

GSGP (E. Kauffman; T. Bralower)

G Engineering Report

Developments (M. Storms) Status of engineering projects at ODP TAMU

Leg 132 (M. Storms; J. Natland) Operations and engineering results on Engineering Leg 2.

Engineering 4 (M. Storms) PCOM had asked for estimates of the distribution of time required for operations on the combined engineering-science leg on the East Pacific Rise.

Recommendations by the Science Operator. Discussion of potential effects on FY91 and subsequent planning.

Break 1500-1515 Coffee

H Adjustment of Near-term Program

In light of various requests, panel recommendations, and the engineering and other reports heard here, what if any adjustments may be required in the FY91 program? How will adjustments affect scheduling?

Leg 135 (Lau Basin - Tonga Arc). Relation to PPSP meeting; time estimates.

Leg 136A (FDSN Pilot Hole) Relation to FDSN liaison report, SSP report, DMP logging recommendations (and if to be fully logged, should it be fully cored?), request to test borehole seal; time estimates and their relation to EXCOM-ODPC desires.

Leg 136AA? (further engineering test before EPR) At the time that entry into this agenda book is being closed for reproduction and mailing (27 July), we were told that a message from J. Natland and G. Brass from onboard the *JOIDES Resolution* had been FAXed to us, but we have not received it. Natland and Brass can speak to the subject, which is reported to be a request for a further test of the DCS at Loihi, near Hawaii. If so, PCOM will need to hear them and the Science Operator, discuss, decide, and if necessary, determine time requirements

Leg 136B (Hole 504-B) Is there any reason to modify the logging, milling, and if possible, deepening operations decided by PCOM in Paris?

Leg 137 (Eastern Equatorial Pacific Neogene Transect) JGOFS request for experiments on a non-interference basis.

Leg 138 (Sedimented Ridges I) Status of high-temperature tools. Deployment of Geoprops, assuming a successful test of MDCB on Leg 134 or 135.

Leg 139 (Engineering 4 on EPR) Relation to status of engineering preparation.

Is there any PCOM action? Does any action require new recommendations to the Science Operator or instructions to thematic or service panels or to DPGs?

Adjourn 1730

0830 Wednesday 15 August 1990
[Note: As the JOIDES Office is not able to estimate the time for Agenda Item J, the morning coffee break, lunch, and the afternoon coffee break will be set at specific times (1000-1015, 1200-1300, and 1500-1515) rather than on pauses in the Agenda.]

I Scientific Reports of Recent Drilling Legs

Leg 130 (L. Kroenke)

Leg 131 (A. Taira)

Leg 132 (J. Natland)

J Facilitation of Renewal of ODP

Report of the Ad hoc Strategy Committee (J. Austin)
Minutes of the 29 May meeting in Washington, and copies of some other correspondence, are attached. A salient point is a recommendation to PCOM that the following six themes become a focused approach to future ocean drilling:

- High-resolution Neogene Paleoceanography transects
- Sea-level studies
- Deep-drilling to understand the structure and fluid dynamics of accretionary prisms
- Passive-margin evolution
- Evolution of sedimented and unsedimented ridge crests
- Offset drilling for deep lithosphere objectives.

The list had evolved from a comparison of the objectives of Phase 1 of the Long Range Plan with the highly ranked proposals from any ocean, with some committee adjustments in scope and wording.

In light of the themes listed above (while stressing that they are a flexible framework into which modified or new themes could be incorporated), STRATCOM suggests to PCOM that it charge the thematic panels to go beyond existing proposals and DPG drilling plans to synthesize a prospectus involving a finite number of long-term focuses of ODP, each perhaps consisting of 4 to 6 drilling legs. The following questions must be addressed:

- How will such programs be tackled effectively?
- Who will the proponents of these programs be?
- Do the proposals exist to tackle these programs effectively? If not, how will these proposals be generated?

The November 1990 Annual Meeting was proposed as a time to start this process, after a general discussion within PCOM in August.

In addition, the committee proposed the inclusion in the Long Range Plan brochure of a series of one-page summaries of ODP's existing and newly formed relationships with important global initiatives in the earth sciences. These were to be on global change, technology development, global sedimentary processes, ridge-crest processes, high-latitude drilling, and continental drilling.

Also:
- JOI was asked to include a presentation, similar to its one before the National Science Board in March, before EXCOM-ODPC in June.
- JOI was asked to consider augmenting the number of LRP/brochure packets to be published, to allow more mailings.
- NSF was to be asked to approach the Ocean Studies Board of NAS-NRC for a formal review of the LRP(D. Heinrichs was so asked at the EXCOM meeting).
- PCOM is asked to retain STRATCOM as an ad hoc executive subcommittee of PCOM

Dissent to Part of the Report. (Moberly)
In a letter to the committee members shortly after the meeting Moberly detailed his opinion (attached) that for the most part, the committee had excellent suggestions about publicity, coordination, and other ways to help renewal of the program, but that we mislead ourselves if we believe that formalizing and publicizing a focus on half a dozen drilling opportunities will help renewal.

If our sets of themes for future drilling are narrowed there will be important ramifications to our planning on such points as panel interests, funds for scientists in the US and other countries, Global Change, international geoscience initiatives with whom we are developing liaisons, specific criticisms of ODP and the JOIDES advisory structure, national interests and the lolly-pop concept, the use of alternate platforms, and credibility with our panels.

In summary, Moberly wrote his belief that renewal will be helped by keeping the program international, by finding a way to get innovation into our planning but otherwise by keeping faith with our panels, by showing not only how we serve new international geoscience programs but also how we lead them (and by finding how best to work with Global Change), by keeping and rewarding a broad clientele, and by strong public relations including "popular" information for the layman.

Innovative Science: PCOM may want to include in this discussion, and possibly act upon, the recommendation by N. Shackleton about proposals for add-on science opportunities, and the response by T. Pyle.

PCOM will need to discuss these proposals, and in particular decide:
- what actions are desirable for program renewal

- whether or not a sharper focus of future drilling is also desirable for program renewal
- if so, how many topics shall there be and how shall they be determined?
- For the topics that are selected, how can they be turned into effective drilling programs

A Dinner will be hosted on Wednesday evening by the Scripps Institution of Oceanography and Jerry Winterer.

0830 Thursday 16 August 1990

K Old Business: Continuing Issues

Letters: These are mainly for information. There is a letter from Warnke about outside participation in planning and lack of high-latitude drilling legs. There is another letter from Froelich about publication deadlines.

PCOM Watchdogs: PCOM may wish to assign watchdogs for the New Pacific and North Atlantic Proposals under consideration for drilling.

- The new Pacific programs requiring Watchdogs are:
  - Hess Deep
  - Oahu Pilot Hole
  - Peru Gas Hydrates

  In addition EPR Bare Rock Drilling will require another watchdog with the rotation of G. Brass.
- The new highest-ranking North Atlantic programs requiring Watchdogs are:
  - Barbados Accretionary Wedge
  - Cayman Trough
  - Equatorial Atlantic Transform Margins
  - MARK Area: Long Section of Upper Mantle
  - Mediterranean Gateways
  - New Jersey Margin Sealevel
  - North Atlantic: Non-Volcanic Rifted Margins
  - North Atlantic: Volcanic Rifted Margins
  - Northernmost Atlantic Paleoceanography: Arctic Gateway

TAG Area High-Temperature Hydrothermalism
Vema FZ: Layer 2/3 Transition
Vema FZ: Layer 3-Mantle Transition
West Florida Margin Sealevel

Evaluation of ODP drilling results in terms of COSOD I objectives: The JOIDES Office has received responses from 43% of the Co-Chiefs covering 60% of the Legs concerning revisions of the tables that EXCOM asked the JOIDES Office to provide for its Fall 1989 meeting. The JOIDES Office has not received any additional responses since 17 April 1990. The tables have been revised based on these responses. There has been a wide range in the degree of detail of the responses and some conflicts between Co-Chiefs in the interpretation of accomplishments. There were no responses from Co-Chiefs from Legs 101, 102, 109, 111, 114, 115, 116, 117, 120, 124 and 125. The revised tables are provided in the back of the Agenda Book.

L Membership and Personnel Actions

Panels and Panel Chairs

The panels have not made any nominations for replacements on the various panels, therefore appointments do not need to be made at this PCOM meeting. PCOM should, however, consider the disciplinary balance on the panels that will be affected by the following impending changes in membership PCOM may wish to specify the areas for which appointments will be made at the 1990 Annual Meeting.

LITHP S. Humphris has accepted the chairmanship. Normally, R. Batiza would have rotated 1/1/90, but his tenure was extended because of his chairmanship of LITHP. Now that he has stepped down as chairman, how much longer should he serve? L. Cathles and M. Perfit are due to rotate 1/1/91, replacements for them need to be discussed by the panel this fall, for PCOM selection at the Annual Meeting.

OHP It was planned to have 16 members on OHP for the fall meeting and then revert to 15 members after replacing W. Berger and D. Kent when they rotate at the end of 1990. An official letter of resignation has not been received from Eric Barron, but he has been removed from panel membership with the appointment of J. Barron.

Because of heavy commitments this fall, J. Parrish declined the invitation to join OHP at this time but would like to serve in the near future; the alternate L. Pratt accepted the appointment.

SGPP Because of a change in position, a present US member may need to be replaced with someone eligible for USSAC funds. P. Froelich and M. Goldhaber are scheduled to rotate at the end of 1990 and their replacements need to be discussed by the panel at the fall meeting for PCOM selection at the Annual Meeting. SGPP has also discussed the addition of a microbiologist to the panel.

TECP I. Dalziel will be stepping down as chairman after the Fall 1990 meeting. E. Moores has accepted the chairmanship. Normally, Dalziel would have rotated 1/1/90, but his tenure was extended because of his chairmanship of TECP. After he steps down as chairman, how much longer should he serve? R. Buck and D. Engebretson are scheduled to rotate at the end of 1990 and their replacements need to be discussed by the panel at the fall meeting for PCOM selection at the Annual Meeting.

DMP No actions needed.

IHP Both P. Fryer and W. Wise have accepted the Co-Chief positions on IHP.

PPSP No actions needed.

SMP No actions needed.

SSP J. Hedberg has not been able to attend any meetings of SSP and has resigned; nominations for a new oil industry representative will be sought by USSAC. Because of maternity, A. Trehu was given a bye and will become a SSP member in the summer of 1991. The alternate, G. Moore, has accepted.

TEDCOM The addition to TEDCOM of someone with expertise in high-temperature drilling would be helpful. Chevron has replaced W. Cotten with P. Nicholls.

Detailed Planning Groups and Working Groups

A North Atlantic Rifted Margins Detailed Planning Group was established at the Paris PCOM Meeting. It will combine expertise on

volcanic and non-volcanic margins. PCOM needs to set membership and establish the mandate for the DPG at this meeting. S. Humphris has promised to send a further list of nominees from LITHP and we have the list prepared by TECP and LITHP at their joint Spring meeting. These names will be shown on overhead projections at the meeting along with a draft mandate. PCOM must decide on the mandate, membership, and liaison.

A Deep Drilling Working Group was also established at the Paris PCOM Meeting. Plans for a one day meeting of this WG have been made for 26 September one day prior to the TEDCOM meeting. Various individuals have already been invited to attend the meeting, since preparations had to be made well in advance for some participants. A list of possible members will be shown on overhead projections at the meeting. PCOM must decide on the mandate, membership, and liaison.

It was the consensus of PCOM that a North Atlantic Arctic Paleoceanographic Gateway Detailed Planning Group would be formed and staffed at the August 1990 PCOM meeting. N. Shackleton has provided a list of nominations for this group that will be shown on overhead projections at the meeting along with a draft mandate. If the DPG is formed, PCOM must decide on the mandate, membership, and liaison.

PCOM was also to consider the formation of a Sealevel Working Group after the results of the El Paso workshop are examined by the chairmen of the thematic panels. N. Shackleton has provided a list of nominations for such a group and these plus some additions from other panels will be shown on overhead projections at the meeting. If the Working Group is formed, PCOM must decide on the mandate, membership, and liaison.

Liaisons from Service Panels to DPGs

Both DMP and SSP have suggested that they be allowed to send liaisons to meetings of the Detailed Planning Groups to ensure that their concerns are known to the DPG. Having either a DMP liaison or Wireline Logging liaison will help provide realistic logging plans early in the planning process. Having either an SSP liaison or Data Bank liaison will help communicate the coverage of the site survey data base and any deficiencies. Earlier, PCOM had decided that having members from appropriate panels on the DPGs would eliminate the need for liaisons, but this has not occurred in all

instances. The PCOM chairman now handles these requests on an *ad hoc* basis; is this sufficient?

PCOM membership and liaison work.

- At the June EXCOM Meeting the potential gaps in expertise in the areas of ocean history and geochemistry were pointed out to the EXCOM members.

- With recent and upcoming changes in PCOM membership and chairmanship, changes of PCOM liaison responsibilities are necessary (see table).

	LITHP	OHP	SGPP	TECP	DMP	IHP	PPSP	SMP	SSP	TEDCOM
J. Austin						•	10/1			
~~G. Brass~~	•	•								•
M.Cita-Sironi								•		
D. Cowan					•					
R. Duncan		•								
H. Jenkyns		•								
Y. Lancelot						•			•	
M. Langseth					•					
M. Leinen								•		
J. Malpas	•									
R. Moberly							•			
J. Natland	•									•
A. Taira				•						
B. Tucholke				•						
U. von Rad			•							
J. Watkins									•	

PCOM Liaisons to DPGs

J. Natland	EPRDPG
M. Langseth	CAPDPG

Liaison to Global Earth-Science Programs

- Global Sedimentary Geology Program (GSGP)
  T. Bralower (co-chair) and J. McKenzie (member) accepted appointment as JOIDES representatives.

- Federal Digital Seismic Networks (FDSN)
  M. Purdy (co-chair) and J. McClain (member) accepted appointment as JOIDES representatives

- Nansen Arctic Drilling Program (NAD)

T. Vorren, chairman of NAD Executive Committee, listed six NAD names in a letter to Moberly of 20 November 1989, received after PCOM was meeting at Woods Hole, so there was no action at WHOI or Paris. The six: J. Thiede (alt. A. Lisitzin), G. Brass (alt. Y. Kristoffersen), T. Vorren (alt. L. Johnson). OHP has one nominee, and PCOM should consider others.

- International Geosphere and Biosphere Program (IGBP)

IGBP has interests so far in coordinating work on data bases and in the late Quaternary. OHP has nominees ready; we await an answer to the 22 February letter from T. Pyle to H. Oeschger.

- InterRIDGE

We await a formal letter from the international program. PCOM made two provisional JOIDES nominations at the Paris PCOM meeting but no formal actions have been taken *in lieu* of a formal letter agreeing to form the Liaison Group.

- JGOFS

We await a formal reply.

Co-Chief Scientists

Leg 136 (Oahu Pilot Hole and Engineering Leg at 504B) needs to have recommendations for Co-Chief Scientists from PCOM. If we have now settled the objectives and strategy for Leg 136, PCOM can make Co-Chief Scientist recommendations.

Acceptance of slates of members

It will be easiest if PCOM incorporates all personnel changes in a single motion.

M New Business

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N Future Meetings

28 November-1 December 1990, Kailua-Kona, Hawaii. The University of Hawaii will be host the 1990 Annual PCOM meeting at the Hotel King Kamehameha on the big island of Hawaii. The PCOM meeting will be preceded by the Panel Chairmen's meeting on Tuesday, 27 November. A field trip prior to the meeting is possible if there is sufficient interest.

23-25 April 1991, Narragansett, Rhode Island. The Graduate School of Oceanography of the University of Rhode Island will host the 1991 Spring PCOM meeting.

20-22 August 1991, Hannover, Federal Republic of Germany. The 1991 Summer PCOM meeting will be hosted by the Bundesanstalt für Geowissenschaften und Rohstoffe. There will be a two day field trip after the meeting, which will possibly include stops in East Germany.

4-7 December 1991. The 1991 Annual Meeting will be hosted by the University of Texas Institute for Geophysics at the Thompson Conference Center on the Austin campus. The PCOM meeting will be preceded by the Panel Chairmen's meeting on Tuesday, 3 December.

The 1992 Spring PCOM meeting will be hosted by either Oregon State University or the JOI Office in Washington. Dates and venue are to be decided at this PCOM meeting.

Hosts should confirm, amplify, or note changes in any of the above.

O Adjournment

There can be a coastal field trip sometime after the meeting, but because of the timing of low tide it must be during the morning.

JOIDES PLANNING COMMITTEE SPRING MEETING
24-26 April 1990
Société Géologique de France
Paris, France

REVISED DRAFT MINUTES

Members:

J. Austin - University of Texas at Austin
G. Brass - University of Miami
M. Cita-Sironi - Universita d'Milano, ESF Consortium
D. Cowan - University of Washington
R. Duncan - Oregon State University
H. Jenkyns - Oxford University, United Kingdom
Y. Lancelot - Université Pierre et Marie Curie, France
M. Langseth - Lamont-Doherty Geological Observatory
M. Leinen - University of Rhode Island
J. Malpas - Memorial University, Canada-Australia Consortium
R. Moberly (Chairman) - Hawaii Institute of Geophysics
J. Natland - Scripps Institution of Oceanography
K. Suyehiro - Ocean Research Institute, Japan (alternate for A. Taira)
B. Tucholke - Woods Hole Oceanographic Institution
U. von Rad - BGR, Federal Republic of Germany
J. Watkins - Texas A&M University

Liaisons:

L. Garrison - Science Operator (ODP-TAMU)
R. Jarrard - Wireline Logging Services (ODP-LDGO)
E. Kappel - Joint Oceanographic Institutions, Inc. (alt. for T. Pyle)
B. Malfait - National Science Foundation

Guests and Observers:

J. Backman - University of Stockholm, Sweden
P. Blum - Future Executive Assistant and Non-US Liaison in JOIDES Office
M. Cheminee - Université Pierre et Marie Curie, France
A. Crawford - University of Tasmania, Australia
A. Meyer - Science Operator (ODP-TAMU)
K. Pisciotto - British Petroleum Exploration, UK
C. Sparks - Institut Français du Petrole
M. Storms - ODP-TAMU Engineering

JOIDES Planning Office:

H. Iwamura - Secretary
L. d'Ozouville - Executive Assistant and Non-US Liaison
G. Waggoner - Science Coordinator

Tuesday, 24 April 1990

833 Introduction

PCOM Chairman Ralph Moberly called the 1990 Spring Meeting of the JOIDES Planning Committee to order. Yves Lancelot welcomed everyone to Paris. Lancelot explained logistics including a reception at the Université Pierre et Marie Curie. Moberly welcomed new PCOM member Jim Natland and PCOM alternate Kiyoshi Suyehiro standing-in for A. Taira. Introductions were then made around the table.

834 Minutes of 27-30 November 1989 Annual PCOM Meeting

Moberly called for comments, corrections and approval of the previous minutes. There were no further corrections to the draft minutes.

PCOM Motion

PCOM approves the minutes of the 27-30 November 1989 Planning Committee meeting. (Motion Brass, second Natland)
Vote: for 15; against 0; abstain 0; absent 1

835 Approval of Agenda

Moberly called for additions or revisions, and then for adoption of the agenda for the meeting. Several minor additions and modifications were requested in the Agenda.

PCOM Motion

PCOM adopts the agenda for the 24-26 April 1990 Planning Committee meeting with amendments. (Motion Tucholke, second Brass)
Vote: for 15; against 0; abstain 0; absent 1

836 ODP Reports By Liaisons to PCOM

EXCOM

EXCOM has not met since the last PCOM meeting in November. R. Moberly reported that Peter Blum will be the next non-US Liaison, in the JOIDES Office at the University of Texas at Austin.

NSF

B. Malfait reported that the 1990 budget was announced in mid-January. Overall, NSF received an 8% increase with the biggest increase going to Education. The Antarctic program also had a major increase, in part for a new icebreaking research vessel. Geoscience programs had a 5% increase overall, with most going to Earth Sciences. Ocean sciences had a 1% increase and Ocean Drilling got about a 2% increase. Global change programs such as WOCE, JGOFS, and RIDGE got most of the increase. Overall, shipboard support is down. Looking ahead to 1991, Geosciences is requesting an 18% increase mainly for Global Change Programs. The request for Ocean Sciences is around 16% and includes a 9% increase for Ocean Drilling.

The FY90 budget for Ocean Drilling was approved in late December at $38M, with $21.5M from NSF and $16.5M from the international partners. The FY91 budget had a target of $39.3M with a supplement of $0.3M for additional new technology. There has been a reduction of the administrative costs charged by JOI to ODP. After administrative review of the 1991 draft plan, NSF has advised JOI of a final target of $39.6M for the 1991 budget.

US ODP Science Program news items included: there has been an increase in proposals for downhole instrumentation for both the *JOIDES Resolution* and by wire-line reentry; a shallow-water drilling program in the Bahamas with Bob Ginsburg as PI is being jointly supported by Ocean Sciences and MG&G programs; NSF ODP Field Programs that are upcoming are: near-bottom refraction of the EPR around 9°N by Purdy, MCS study of US East Coast margin by Miller, Christie-Blick and Mountain in May 1990 on the *Ewing*, MCS study of the Antarctic peninsula by Dalziel/Austin/Shipley (UTIG) and Hayes/Mutter (LDGO) scheduled for January 1991 on the *Ewing*, Deep-tow study of the Kane Transform by Delaney and Spiess scheduled for early in 1991 on the *Melville* in a joint project with French scientists.

Other items discussed were: the possibility of Soviet participation is being re-examined by the US administration; in March the National Science Board got a briefing on the status and scientific results of ODP; the US Continental Drilling Office (DOSECC) has moved to Texas A&M and joint funds will be used to support an engineer working for both ODP-TAMU and DOSECC; an Index to DSDP volumes is in the final stages of preparation and will most likely be published in hard copy with an accompanying CD-ROM; two positions in the NSF Ocean Drilling program are going to be advertised.

Discussion

Cowan asked what percentage of proposals for field programs are getting funded. Malfait said that less than 50% get funding. Moberly said that any percentage near 50 is an improvement over the previous level of around 24% funding.

von Rad wanted to know what other responses had been received on USSR participation besides the one from the Science Advisor to the President. Malfait said that there have been expressions of concern over USSR participation by some other segments of the government related to technology transfer.

JOI

E. Kappel discussed the status of the FY91 program plan and budget after the BCOM meeting in March. The target budget of $39.3M is less than the $40M predicted in the 4-year program plan as necessary to continue technology development. Continued development has been possible due to fortunate circumstances, including constant day-rates, which have saved about $1M,

and reduction of indirect costs at JOI by around $400K. BCOM had suggested that an additional $450K be requested for cooperation with Sandia to develop and build two sets of high-temperature slimline tools JOI is interested in knowing if other groups could compete with Sandia to supply these slimline tools in time for the upcoming drilling legs. A second set of tools does not appear to be possible in next year's budget. The Micro-paleontological Reference Center bids are due at the JOI Office and it appears that it will require about $70K per year for two years. Special Operating Expenses in the FY91 budget (Appendix A) include: $843K for continued development of the Diamond Coring System; $172K for publication of 4 additional *Proceedings* volumes; $450K for replacement of exceptionally high losses of drilling supplies; $180K for dewarring of slimline tools donated by ARCO; $46K for shipboard FMS processing; $30 K for CONOCO consortium fee; plus some miscellaneous other equipment purchases.

Actions related to ODP renewal efforts have included: well-received presentations by R. Corell, J. Baker, W. Ruddiman, P. Fryer, P. Worthington and N. Pisias to the National Science Board; Long Range Plan has been sent to the printer and the complete portfolio will be available by the June EXCOM meeting. 3000 copies of the LRP will be printed and will get distributed to JOIDES Journal recipients and 100 copies to each ODP Office of the non-US partners. The portfolio will consist of the LRP, a layperson brochure and additional space for a member-country brochure.

Coordination with other International Geoscience Programs is progressing. PCOM has formally named JOIDES members to the GSGP Liaison Group and provisionally to FDSN. A positive response has been received from the Nansen Arctic Drilling Program. Discussions have begun with: InterRIDGE which will have an international meeting in Brest on 12-14 June; International Geosphere/Biosphere Program; US Continental Scientific Drilling Program, FRG KTB; Italy ENEL/UNG. More effort is needed with such other continental drilling and geothermal programs as Geol. Prof. de la France, UK Geothermal-hot dry rock, Japan, USSR, Sweden etc. PCOM needs to consider drilling holes in cooperation with these other programs; the pilot hole north of Oahu for FDSN would show a strong commitment to this kind of cooperation which will strengthen ODP.

Discussion

Leinen asked why no letter had been written to the International JGOFS Office. JGOFS is very interested in cooperation in the Eastern Equatorial Pacific Neogene Transect Leg. Kappel said that JOI would write JGOFS.

Cita agreed that PCOM needs to give a high priority to cooperation and make a commitment to drill a hole such as the Oahu pilot hole.

Tucholke said that he is concerned that there was no competition for the funds for the high-temperature slimline tools. Garrison said that the problem was the limited period of time before the tools are needed; there was the need for a supplier that could provide instruments in a timely fashion. Moberly said that Sandia has invested a lot of money in developing high-temperature logging tools, allowing for a quick response. Malfait said that because co-mingled funds are being used, the competition should be open to the international partners. Kappel said that JOI is aware that there should be both open competition and international competition for these funds, but to issue an RFP would take time and the drilling is coming up very soon. Kappel asked if any PCOM member and especially the non-US partners know of someone who could provide the high-temperature slimline tools in a timely fashion; if so, they should let JOI know.

Science Operator

L. Garrison reported on the current drilling on Leg 131 at the Nankai Trough. At Site 808 (NKT-2) the predicted turbidites were encountered during drilling. The A-hole was drilled to 112 mbsf but the pipe became stuck and after packing off the BHA was lost at 83 mbsf. The B-hole was XCB cored to 359 mbsf and before the RCB change-over it was decided to log the hole. During the logging operations, logging tools including a radioactive source were lost. For the C-hole, the drill-in casing system developed for Leg 110 was tried and the hole was cased from 14 to 105 mbsf. Further drilling with the RCB is approaching the décollement at about 1000 mbsf. Bad weather and strong currents have hampered operations at this site. The LAST tool has not worked well.

A. Meyer reported on Leg 130 on the Ontong Java Plateau. This was a very successful leg, with 4822 m of core recovered from 5 sites. In the Neogene transect, OJP-6 was substituted for OJP-3 based on the results of drilling at the previous site (803, OJP-4). Drilling at Sites 803 and 807 recovered basement, with about 150 m recovered at 807. There was a successful airdrop of the multi-shot orientation device that was flown from Ponape.

J. Backman commented that a textbook stratigraphy was recovered, which included K/T boundaries at two sites. Some shipboard scientists were uneasy by what were viewed as two competing programs. Cita said that based on the results, the decisions made onboard appear to have been good. The leg was clearly successful as a multiple objective leg which has provided abundant core for everyone to study. Leinen said that any problems caused by arguments over the objectives of the leg were the results of PCOM decisions and PCOM needs to be more careful in defining these objectives in the future.

L. Garrison next presented some minor changes in the ODP Operations Schedule (Appendix B). The port for the end of the NE Australia Leg and the beginning of Vanuatu Leg is now Townsville rather than Brisbane and the

dates are 11-15 October. The Vanuatu Leg has had 6 days added as a result of Safety Panel considerations, and is now 62 days long. The port dates in Suva have been changed to 17-21 December.

A. Meyer discussed the staffing of legs. Co-Chief Scientists have been named for Sedimented Ridges 1 (E. Davis and M. Mottl) and for Eastern Equatorial Pacific Neogene Transect (L. Mayer and N. Pisias). Staffing is almost complete for Legs 133-135 with the exception of some non-US partners. Leg 137 and 138 will be staffed in June. Meyer presented the tally of shipboard participants through Leg 130 (Appendix B).

Since the November PCOM meeting, 7 *Proceedings* volumes have been published (Appendix B). The "Scientific Results" through Leg 107 are out and by the end of FY90, the "Scientific Results" through Leg 116 and "Initial Reports" through Leg 128 are expected to be published. It is now taking from 37-40 months post-cruise for the "Scientific Results" to appear and this should decrease to 33 months post-cruise by next year (Appendix B). The initial meeting at 3-4 months post-cruise of the essential part of the shipboard party for Legs 125-128 has worked well. The first 12-month post-cruise meeting will be for Leg 125 around the end of May.

Malfait asked what the optimum number of persons was for the initial meeting at 3-4 months post-cruise. Meyer said that the Co-Chief Review Meeting suggested that one from each critical discipline is needed, so that means 7-8 persons. Austin asked if this meeting had to be held at TAMU. Meyer said that TAMU is where the information needed for the "Initial Reports" is most readily available and therefore the meeting should be held there.

Duncan asked if the problems with publications illustrated by the letter from W. Prell in the Agenda Book were representative. Meyer said that it was typical of the problems caused by lack of communication and the necessity to set deadlines before getting a response from individuals. A compromise deadline has now been set for May which should allow the manuscripts to get finished. Duncan asked if many synthesis papers get delayed because of the slow submission of other manuscripts. Meyer said that under the new system of meetings, draft manuscripts should be brought to the post-cruise meeting and the Co-Chiefs can begin writing their synthesis papers based on these drafts.

Meyer distributed the recommendations from the Fifth Annual Co-Chief Scientists' Review Meeting (Appendix C) held in March and emphasized items of concerns for PCOM. Meyer said that there were two recommendations about Science Operations which are related to PCOM: better scientific justification for logging recommendations by DMP; and liaisons from relevant thematic panels to the pre-cruise meeting. Recommendations about scientific equipment and procedures included two

workshops, one of paleomagnetists and the other of physical properties specialists, to make suggestions for improvements in shipboard facilities. There is also a recommendation that the multi-shot orientation tool be run in all APC holes for reversal stratigraphies. Under curation recommendations, the Co-Chiefs suggested that the master sampling report produced at the end of the cruise be augmented to include information about what scientific studies will be done and what must be completed to fulfil cruise obligations. Publications recommendations include one that the initial post-cruise meeting should include at least one person from each discipline "critical" to the cruise objectives.

Brass was concerned that having only liaisons from the relevant thematic panels might lead to confusion over the priorities of various objectives; PCOM should be balancing the objectives from the various panels and integrating them into multiple-objective legs. Meyer said that the Co-Chiefs said that they would like to have a better knowledge of the background for the leg priorities, this could come from PCOM or its representatives. Lancelot said that PCOM as a body does not generally look at proposals and therefore it would be better to have the experts giving advice at the pre-cruise meeting. This is especially true since the cruise prospectus is being used as a legalistic document and requires details about cruise objectives. Brass said that members of PCOM, especially watchdogs, do read the proposals and minutes of thematic panel meetings. PCOM synthesizes the information and balances the various objectives on multiple-objective legs. Natland said that from experience as a former WPAC member, regional panels integrate information when preparing their prospectus. Austin said that as recommendation #5 states, invite proponents to be Co-Chiefs, if this is not done someone needs to distill the minutes. Moberly reminded PCOM that the Science Plan, approved at the Annual Meeting and written by the JOIDES Office, is a distillation of science advice from panels and PCOM.

Austin agreed with recommendation #3 that wider and more timely distribution of short summaries of upcoming legs is needed; these should appear as soon as possible after PCOM schedules the legs. Leinen suggested that this be taken up with AGU for publication as a periodic information item in EOS, as is done for some other programs. von Rad said that a one-page summary would be helpful for keeping a wider community informed. Brass and Cowan agreed that this was an important item. Meyer said that in terms of staffing of a leg, this information needs to be out about 12 months in advance of the leg.

Lancelot said that as a recent Co-Chief, he thought that the paleomagnetist workshop was an important item for consideration. Moberly said that the easiest way to handle this item is to invite some appropriate guests to a SMP meeting and to have some time put aside for discussing the problems and possible solutions.

Langseth said that he was concerned about the statement regarding DMP needing further scientific justification for their logging recommendations. Further discussion on items from the Co-Chief meeting was deferred until the reports of the panel meetings.

Meyer reported that since funds have been made available, the production of a CD-ROM containing ODP data is now underway. NGDC will be developing the software, which is the most expensive part of the process, for producing the ODP CD-ROM. The plans are to take a "snapshot" of the ODP data at the time of production of the master, later "snapshots" will be used to remaster the CD-ROM as more data accumulates. Lancelot asked when the CD-ROM that is accessible by the Macs will be ready. Kappel said that this is still at least 5 months down the road. Meyer said that the ODP CD-ROM should be Mac accessible.

The West Coast Repository at Scripps is being relocated to a new building, so that ODP cores will now be housed in one location. Based on an IHP recommendation, Job Descriptions are now mailed with the letters of invitation, which spell out the time requirements and duties of the particular position.

Austin asked if there was any attempts being made to keep the size of the science party down. Meyer said that this was being attempted.

Wireline Logging Services

R. Jarrard presented the Wireline Logging Services report for the Lamont Borehole Research Group. He discussed logging results from Legs 129 and 130 (Appendix D). Leg 129 had only modest logging plans to begin with and problems with the logging cable resulted in even less logging than anticipated. The seismometer experiment on Leg 128 used several kilometers of cable which was to be replaced, however, due to problems with the Japanese Export Agency, the cable was not allowed to go onboard the *Resolution*. This resulted in a splice at the end of the cable and the inability to use the SES. After a tool got stuck and the cutter and crimper misfired near the middle of the cable, the likelihood of successful further logging with that cable decreased significantly. Therefore the lower interval of Hole 801C could not be confidently logged and the decision not to log was made in consultation with the Schlumberger logging engineer, BRG, PCOM Chairman and the Science Operator. The new logging cable did arrive for Leg 130 and logging was efficient on this leg. Post-cruise processing of the logging data has revealed identifiable Milankovich cycles in Leg 129 and Leg 130 records, which can be used for sedimentation rate studies (Appendix D). One of the primary logging objectives on Leg 130 was to help with correlation between Sites 586 and 806 and the logging is complete enough to allow compilation into a continuous stack (Appendix D). The FMS data in the basement allows identification of pillows and will allow core orientation. Processed FMS data

from Leg 126 has been used to orient cores and identify rotation of the Philippine Plate using the dip direction (Appendix D).

On Leg 131 at Nankai, a $200K tool string was lost when the drillstring was inadvertently lowered onto the tool string due to a communications problem between the driller and the logging winch operator. An entanglement of lines above the blocks, necessitated lowering the drillstring, but the driller failed to alert the winch operator. There may be some problem with backup supplies due to loss of the swivel. BRG is looking into a resupply by a small boat. The wireline packer was modified up to the last minute, but was ready for use on the leg in either perforated casing or in the open hole. The wireline packer can be used in the open hole only if the caving rate is low, otherwise there is the danger that too much material will pile up on the tool and get it stuck.

Looking ahead to milestones expected for downhole measurements over the next 12 months: the wireline packer will probably be used on the Nankai and NE Australia legs; some slimhole logging techniques will be tested on the Engineering 2 leg, the new SES will be used on the NE Australia leg, which will also include shipboard FMS processing; the German digital televiewer will be used on the Vanuatu leg as well as a trial of the French magnetic-reversal stratigraphy tool; the Sandia high temperature and fluids tool will be tested on Engineering 3; cooling by circulation will be tested on the Sedimented Ridges leg.

Discussion

Brass asked if the Custer temperature tool had been considered. Langseth said that temperatures would have to be less than 350°C for that tool. Garrison said that Sandia will be lending both a memory tool and an active temperature tool. Tucholke asked if the fluid sampler was from Sandia or Los Alamos. Jarrard said it was Los Alamos. Langseth asked if there would be a seal for the holes. Storms said that ODP would have a basic seal ready to be deployed, but it may not have the sensor package.

Langseth asked if there was a better hope of success at Cascadia for the geotechnical tools that were anticipated to work on the Nankai leg. Jarrard said that one problem was that technology development took longer than anticipated and the other was hole conditions at Nankai have been worse than expected. Lancelot said that the problems caused by sands at Nankai were not unexpected and the leg was planned knowing that this could cause problems. Brass echoed this and said the leg was proceeding as planned. Langseth said that PCOM should be more realistic about tool development. Moberly said that PCOM discussed the risks and both took some advice and ignored other advice from panels; the decision was to stay at the edge of technology development in order to advance the program. Leinen agreed that being at the edge of technology was needed, but the ability to drill and

maintain a hole in the expected sand-rich environment was not adequately addressed during the planning of the leg. Garrison said that the use of the drill-in casing was successful in establishing a hole and some geotechnical measurements can be made with the wireline packer and LAST tool.

837 Reports By PCOM Liaisons

LITHP

Liaison R. Duncan reported on the 5-7 March 1990 meeting of LITHP, which was held jointly with TECP. An important question that arose during the ranking of programs was, what constitutes a proposal for consideration in the 4-year plan, since there is a range from letters to fully mature and developed proposals. LITHP decided that in their rankings all proposals within a theme would be considered as potential programs. LITHP spent considerable time discussing Engineering 3 at 504B and the EPR. At 504B, LITHP recommends a 3-day logging program before the attempt to clean the hole by fishing and milling. If the hole is cleaned, LITHP recommends that it be deepened as much as possible with the remaining time and therefore a small scientific staff be onboard the *Resolution*. At the EPR, LITHP recommends that two sites be established with about 50 m of basement penetration and that a modest science party be on hand.

During the joint session, deep drilling was discussed and LITHP recommended the establishment of a task force to consider how best to approach drilling deep holes in oceanic environments, since it does not appear to be feasible to drill a hole deeper than 1.5 to 2 km at this time. ODP could help sow the seeds for a future deep drilling program. LITHP along with TECP recommended the formation of a Volcanic Margins Working Group and suggested a slate of names for consideration. The lack of combining petrologic and tectonic objectives during zero-age crust drilling was jointly discussed and there will be efforts to combine the two in future drilling programs. During the joint session there was a presentation by M. Purdy about the Ocean Bottom Seismic Station pilot hole north of Oahu and both LITHP and TECP endorsed drilling this hole.

Discussion

Natland said that Susan Humphris has been unanimously nominated to be the next LITHP chairman.

von Rad asked why LITHP recommended that the Lau Basin Working Group be asked to look at the proposal for drilling ore deposits in the back-arc since the Working Group no longer exists. Natland said that LITHP thought that the proposal deserved consideration as a back-up site. Further discussion was deferred until Minute 850.

OHP

Liaison G. Brass reported on the 29-31 March 1990 meeting of OHP, which spent most of its time reviewing proposals and ranking programs. OHP discussed the present publication targets and the impact on synthesis chapters and content of the volumes. OHP generally endorsed the schedule with several concerns about about delays caused by the editorial process and getting important data included in the volumes. OHP also spent time discussing the addition of personnel to the panel. OHP expressed concerns about the ability to recover organic-rich sediments on the continental margins that are important for paleo-productivity studies but which may be excluded from drilling by safety considerations.

Discussion

Garrison asked about the importance of the organic rich sediment drilling. Brass said that it is very important for understanding the carbon cycle and will probably require drilling in deeper and more risky environments as well as gas hydrates. Both OHP and SGPP probably need to send liaisons to PPSP to discuss these issues since they address fundamental science.

SGPP

Liaison G. Brass reported on the 14-16 January 1990 meeting of SGPP, which followed the USSAC Geochemistry workshop. The main focus of the meeting was the reviewing of proposals and ranking of programs for the 4-year plan. SGPP also worked on another revision of their white paper and position papers on technology and sampling issues. J. Parkes also presented a preliminary report on the biological activity experiments conducted on cores from Leg 128. T. Pettigrew presented information on the pressure core barrel and SGPP discussed what features would be desirable. SGPP questioned the necessity of routinely collecting and freezing whole-round core samples for future organic geochemistry studies. They suggest that a study be made of the numbers and kinds of research programs done with these cores.

Discussion

von Rad asked why names have been suggested by several panels for a Sealevel Working Group, when PCOM has not formed one. Moberly said that this was done in anticipation of a PCOM action, which PCOM said would follow and be based on the report from the sealevel workshop. Watkins said that the El Paso Workshop Report will be coming out very soon.

TECP

Liaison B. Tucholke reported on the 5-7 March 1990 meeting of TECP, which was held jointly with LITHP. TECP did a thorough job of looking at all the ODP proposals in order to see which new and old proposals had TECP interests in them. TECP would like to see more documentation about the

structural settings of proposals when it is relevant to the objectives. The Chile Triple Junction still remains the top program for TECP, although there is some concern over the location of specific sites. During the joint session with LITHP, the tectonics of mid-ocean ridges was discussed. TECP is concerned that there has not been an appropriate consideration of what tectonic objectives can be addressed by MOR drilling. E. Moores will be preparing a position paper for TECP on MOR tectonic objectives. TECP and LITHP recommended the formation of a Volcanic Margins Working Group. TECP emphasizes that stress measurements in holes of opportunity are important objectives for understanding fundamental geodynamic processes.

Discussion

Natland thought that better guidelines for preparation of proposals need to be formulated so that there is integration of proposals into stronger programs.

Brass asked how TECP would measure stress. Tucholke said that orientation of breakouts in basement holes is the current method; TECP is trying to encourage the integration of these measurements with other programs in holes drilled into basement.

DMP

Liaison M. Langseth reported on the 23-24 January 1990 meeting of DMP. The meeting was held at TAMU and the panel was able to examine the new SES and discuss its operation. DMP was concerned that PCOM had not specifically endorsed its recommendations at the November meeting. Langseth went over the 17 recommendations given in the Executive Summary of the DMP minutes. Moberly pointed out that PCOM does take the advice of its panels under consideration but does not always make specific endorsements of them. Many of the recommendations of DMP involve budget items for the subcontractors and have to be worked out by them, JOI, and the Budget Committee. ODP is putting an effort into developing high-temperature logging tools now that these legs have been put into the schedule. Funds have been shifted to start developing the tools as soon as possible. T. Pyle has undertaken to help coordinate interprogram tool development. The decision not to log the lower section at Site 801C was discussed previously by R. Jarrard during his presentation and needed no further justification. Langseth said he was concerned that reaming of the 4-inch DCS hole to a 6-inch size compatible with the present suite of logging tools is not receiving enough attention from ODP-TAMU. Discussion of the logging at 504B was put off until after discussion of the Engineering leg in Minute 846.

Discussion

Jarrard asked when the reaming option will be tested. Storms said that it might be possible to test this on the upcoming Engineering leg, but he does not consider it a promising option. Natland said that if the DCS works it may

be used at many sites, including use as a mini-riser system, therefore slimline logging tools will be needed. Lancelot said that this was considered before and the ODP budget could not cover the costs of developing new slimline tools. Brass said that the major problem was developing slimline tools for hot environments, suites of slimline tools exist for normal hole conditions. Jarrard said that there is some hope of modifying a small number of tools for hot conditions but at great expense. Leinen said that further discussion should wait until after the Engineering Leg when there will be new information. Lancelot said that since logging is so important to the future of the program, this discussion should be taken up again when there is more time and new data to examine.

IHP

Liaison J. Watkins reported on the 7-9 March 1990 meeting of IHP. The panel has made a number of suggestions concerning problems pertaining to publication of the "Scientific Results" volumes including: enforcing deadlines; keeping Editorial Review Boards; having the staff scientist act as an on-site expediter for the volume; appoint an additional outside ERB member at the request of the ERB chairman to lessen the load. IHP also reviewed the DSDP printed index and recommended that it be published. IHP will review the ODP indexing of volumes and make suggestions. IHP has made suggestions for what kinds of data should be included in the ODP data base. IHP recommends that a second systems manager be put on the *Resolution*.

Discussion

Lancelot asked if the expense to publish the DSDP Index would be small. Meyer said that it would be. Malfait said that there were questions about the utility of the Index in printed form and said that an attempt would be made to put it on a CD-ROM using money outside of ODP.

von Rad asked what was being done to ensure that the Co-Chief synthesis papers would be included in the "Scientific Results" volumes. Watkins said that IHP thought that it was important to have them included and their suggested changes are designed to lighten the load on the Co-Chiefs for this purpose.

PPSP

Liaison R. Moberly reported on the 27-28 February 1990 meeting of PPSP. Sites for legs 132 (Engineering II), 133 (Northeast Australian Margin), and 134 (Vanuatu) were approved. Some of the sites for Legs 133 and 134 were adjusted slightly for safety considerations. On Leg 133 special care in monitoring will be demanded on several sites, especially those along the edge of the Townsville Trough. Both Co-Chief Scientists, an additional geophysicist, and the organic geochemist for Leg 133 were present at the meeting; engineers were present for 132 and both Co-Chiefs for 134.

After a review of hydrocarbon shows in the Sea of Japan on Legs 128 and 129, PPSP and guests began a discussion of current trends of monitoring techniques and equipment. They also had a further discussion of clathrates, and held a discussion of factors in the safety of drilling virgin but potentially hydrocarbon-bearing basins of continental margins. A subcommittee of organic geochemists is to develop expanded guidelines for monitoring gas shows and to draft revisions of PPSP policy on gas hydrates. Their report, and a final one on the Exmouth Plateau drilling, will be presented at the next PPSP meeting.

SMP

Liaison M. Leinen reported on the 20-21 March 1990 meeting of SMP. No minutes were available from the meeting. The decision of SMP is that No Radioactive or Enriched Stable Isotope Reagents be allowed onboard the *Resolution*. Requests for exceptions should be channeled through the thematic panels for justification and passed to SMP for action. Operation SWAB found that the *Resolution* is presently free of contamination. The test of the high-speed streamer was not optimal, but did not indicate any improvement in the records. The opinion of the geophysicists is that the ODP streamer data is not that bad. The system for digital recording of the Visual Core Description (VCD) was examined and judged to be "awesome". The system is flexible and should improve the quality of the VCD. Computer capture of color core descriptions was also demonstrated by R. Merrill. SMP still recommends the purchase of a real-time GPS data monitor and a sulfur coulometer. SMP requests a workshop of paleomagnetists and physical-properties specialists to suggest improvements for the labs and procedures on the *Resolution*.

Discussion

Jenkyns asked about how the exceptions to the rule about no radioisotopes would be handled. Leinen said that the mechanisms have yet to be formulated. Brass said that this needs careful consideration because of the potential conflicts between panels; what may be scientifically desirable for one panel may be a disaster for another.

SSP

Liaison J. Watkins reported on the 9-10 April 1990 meeting of SSP. The panel has examined the complete data package from Leg 136, Engineering 3, and recommends completion of the planned near-bottom seismic study, in order to assess the thickness of the rubble zone, before placement of the guidebases at the EPR. For Leg 137, Sedimented Ridges, all data requested by SSP are now in hand. SSP recommends the collection of near-bottom side-scan data in the Escanaba Trough. For Leg 138, Eastern Equatorial Pacific Neogene Transect, the data are in hand although proponents are refining seismic data with further processing. Regional data packages are now considered generally

adequate for Chile Triple Junction, Cascadia, Atolls and Guyots, North Pacific Neogene and Bering Sea, but SSP has specific recommendations for desirable improvements. SSP will do a final review of Chile Triple Junction when site locations are refined. A July meeting is planned to examine programs in the 4-year track more carefully.

TEDCOM

Liaison J. Natland and TEDCOM chairman C. Sparks reported on the 13-14 February 1990 meeting of TEDCOM. The committee discussed the continued development of the 4500-meter version of the DCS, and inspected the DCS in the contractor's yard. Representatives of the thematic panels presented their technological objectives, especially with respect to deep drilling and the recovery of undisturbed cores in unconsolidated sediment. TEDCOM is concerned about the problem of fatigue failure in pipe that non-destructive testing for cracks has not predicted and suggest that ODP avoid running heavily-used pipe. TEDCOM is favorably impressed with the improvements in the DCS system since Leg 124E which have included: secondary heave compensator; top-drive system and winch; integrated platform, mast, and power-pack systems; core-barrel assembly; diamond core bits; bottom-hole assembly bits; latch for center bit; riser connector-tensioning tool; mini-hard-rock guide base; casing hanger; back-off sub; modified re-entry cone; and DCS 3-1/2 inch drill rod string. The addition to TEDCOM of someone with expertise in high-temperature drilling would be helpful.

838 Deep Drilling

TEDCOM had previously examined the Long-Range Plan in terms of the technological developments that are required and had noted that very deep drilling of Phase 1 and 2 objectives may be realistic but depend on manpower commitment and budget increases. Phase 3 objectives including a MOHO objective may not be realistic and TEDCOM recommended the organization of an International Symposium to address these concerns. PCOM suggested that as part of the 13-14 February 1990 meeting of TEDCOM, representatives of LITHP, SGPP, and TECP present their technological objectives, particularly those related to deep drilling. Discussion centered around the COSOD II goal to drill through the crust into the mantle. To drill this kind of a deep hole will require the investment of both a large amount of time and money (estimates suggest 4 or more years of time and a $500M cost). Some requirements for a hole to this depth include: dedication of a platform for extended amounts of time; a top drive system capable of establishing a large-diameter, perfectly vertical hole; a severing system; a riser system; and downhole turbine drives. In essence, it would be a system vastly different from the one on the *Resolution*. TEDCOM favors the creation of a small task force composed of members of TEDCOM/TAMU/LITHP plus some additional expertise in deep drilling to discuss how to proceed. Access to Russian experience of deep drilling and coring must be obtained.

Discussion

Malpas said that this technological evaluation of COSOD I & II priorities is long overdue. The present evaluation suggests that a dedicated long-term effort in the area of Lithosphere drilling will be needed to obtain these COSOD goals and this would be at the expense of other areas that ODP has pursued in the past. ODP must eventually make a decision about where it is headed. If ODP does not make a commitment to developing these drilling capabilities, then it is the same as saying we are giving up on the COSOD goals. Cowan is in favor of this kind of deep drilling as a scientific goal, but the realities of cost suggest the need for examination of whether or not it should be part of ODP. Watkins said that if these costs are accurate, deep drilling would seem to require development outside of ODP. This makes further assessment of the engineering requirements and costs vital.

von Rad was concerned that other communities within ODP, such as OHP, also require drilling time. Natland observed that programs such as margin drilling and some deep stratigraphic tests require a drilling capability of more than 3.5 km, which cannot be done with the present system.

Lancelot made the observation that ODP is approaching a turning point. Support for continuing in the present mode is waning; new science frontiers and special developments are needed. These can include some deeper objectives, not necessarily through the crust into the mantle, but at least some new and exciting challenges. Deep drilling into the Earth is a new scientific frontier. Leinen suggested that with its well-developed scientific base, ODP can serve as a spring-board for other new programs. Natland said that both COSOD and the workshop on Drilling the Oceanic Lower Crust and Mantle convened by H. Dick showed that there is a broad community interested in deep drilling.

Cita said a study needs to be done to see if the objectives of deep crustal drilling can be accomplished by an offset drilling program and to determine the feasibility of deep drilling considering the financial costs. Natland said that more is needed than just a price tag, we need to start thinking about future programs. Garrison said that the present program will not evolve into one focussing on deep drilling; another structure in parallel to ODP is needed. Leinen said that for a deep drilling program to be successful it would need a structure similar to the one that ODP has developed.

Malpas said that the Long Range Plan needs to be examined to see what other developments are critical for ODP's future. Cita was concerned that there were items in the LRP that may not be technically feasible. Brass said that the LRP was designed to show what new areas of scientific endeavor were viewed as promising for ODP to move into and it was not assumed that the *Resolution* had to have all of these capabilities; alternate platforms were considered as part of the plan. Malpas said that it was important for ODP to

move into new areas of science. Austin said that the LRP was consistent with COSOD goals.

Moberly suggested that a small group meet in conjunction with the next TEDCOM meeting which will include appropriate persons from other deep drilling programs (e.g. Soviets, Swedes, Japanese, Germans, etc.). Austin suggested that a Workshop would have the advantage of including a bigger constituency in the planning. Brass agreed that a large constituency needs to be developed. Austin asked how quickly this effort needs to be developed. Lancelot said that ODP needs to show that it is addressing these concerns and planning new initiatives. Malpas said that ODP needs to be actively pursuing these goals. Jenkyns said that the pragmatic view in the UK is that they cannot pursue both NEREIS and ODP and he was not sure how a separate deep drilling initiative would fit into the picture. PCOM took action in Minute 845.

Wednesday, 25 April 1990

839 Engineering Developments

M. Storms distributed a handout on the status of various engineering developments. He then discussed the following developments: Motor Driven Core Barrel (MDCB) formerly called the Navidrill Core Barrel (NCB3) has undergone further modifications and will be tested again on Leg 134; Sonic Core Monitor (SCM) was tested on Leg 130 where it had 4 good runs but still had some problems with core jamming and will undergo further testing on Leg 134; Drill-In-Casing System (DIC) was successfully used on Leg 131; Advanced Piston Corer-Design Upgrade (APC) was used extensively on Leg 130 where it had a rapid turn-around time and high recovery rate; APC Breakaway Piston Head (BPH) was field tested on Leg 130 where there were problems with premature releases of the piston head resulting in poorer core recovery; TAM Drilling/Straddle Packers (TDP) are ready for use on Leg 131 (Nankai) and a new go-devil redesign allows deployment of a downhole flow-meter; Pressure Core Sampler (PCS) was modified for use on Leg 131 (Nankai) adding another sampling port for sampling fluids by displacement from the chamber and a "harpoon" sampling port for sampling fluids from inside the core sample; Conical Side Entry Sub (CSES) should be available for Leg 133; Vibra-Percussive Coring (VPC) drive unit is under fabrication. Investigation into the techniques and hardware required for high temperature drilling and coring operations is continuing; it is currently planned to test prototype hardware for controlling steam flash hazards on the third engineering leg. The Development Engineering schedules (Appendix E) were shown.

Technical support of third-party developments continues to be a significant role of ODP engineering, these include: Lateral Stress Tool (LAST) being developed by K. Moran for use at Nankai; Geoprops Probe being developed by

Dan Karig which is still in the final stages of fabrication and probably will not be deployed before Leg 134 (Vanuatu); Pressure Meter also being developed by K. Moran which should be ready by the end of Spring 1990; Flow Isolation Plug is under discussion with E. Davis, B. Carson and K. Becker who are seeking outside funding and a prototype plugging system will be tested on the third engineering leg.

The Diamond Coring System (DCS) has been receiving about half of the Engineering resources at ODP-TAMU. Leg 132 will thoroughly test the system in its present configuration. The secondary compensation system has not been fully land-tested and modifications are still being made. There was a computer software problem which resulted in the weight-on-bit not locking in. The system is 80% functional and Storms was confident that the system will be fully operational for Leg 132 tests.

840 Preparations for East Pacific Rise Drilling

Engineering Planning

Storms first discussed improvements to the DCS system and then operational plans for Engineering 3, which are illustrated in diagrams in Appendix F. Storms reported that a major factor in system performance at the East Pacific Rise will be how long the drill bits last during drilling operations. By drilling the BHA into the rubble zone and leaving it in the hole, it is anticipated that the bit life should improve over the short bit life for drilling at the Mid-Atlantic Ridge. This is because redrilling the rubble caving in from the sides considerably lessens penetration rates and bit life. The minimum that the BHA needs to be drilled in is 5 meters. With the Pogo concept it should be possible to find a location where the BHA can get sufficient penetration. The depth to which the BHA has to be drilled to case off the rubble zone will be the determining factor on the length of the Engineering 3 leg. Estimates are that around 25 days will be required per site on the EPR (Appendix F). Current estimates are that it will take about 125 days to drill 2000 m on the EPR using the DCS. At each site established on the EPR about $100K worth of hardware will be left in the hole but the guidebase can be picked up and moved to another location.

East Pacific Rise Detailed Planning Group

A letter from E. Davis outlining the results of the EPRDPG meeting was distributed. J. Austin, who was the PCOM liaison to the meeting, reported that the DPG first examined the report that the former East Pacific Rise Working Group had prepared outlining a general drilling strategy and decided it was still valid. The DPG next examined the data sets for the two competing proposals and decided that the better area was at 9°40'N, based on the geophysical data set which includes seismic refraction studies interpreted to indicate that the top of the magma chamber is reachable by drilling. The time estimates for reaching the high-temperature reaction zone at the top of

the magma chamber is sobering and led to an approach of initially drilling only two holes rather than the 8-hole pattern originally proposed. Current plans are for a 1-1.5 km deep hole slightly off-axis and a 500 m hole in the axial fissure zone. The DPG has recommended that Engineering 3B at the EPR be delayed until after a cruise by M. Purdy in early 1991, which is expected to characterize the rubble zone by a near-bottom seismic study. The DPG has made some suggestions for further site-survey work. Although tentative sites were selected by the DPG, the precise locations were not chosen because the DPG felt the results of the detailed survey by Purdy were needed first. A detailed report will be submitted in time for evaluation by the thematic panels at their fall meetings.

Discussion

Brass asked what the depth was to the magma chamber. Austin said that a negative seismic anomaly at a depth of 1-1.5 km is interpreted to be the top of the magma chamber.

Langseth asked if the plans were to drill an active hydrothermal discharge system. Austin said that in order to avoid high temperatures the plan was to stay away from active edifices, but there are extinct hydrothermal chimneys which can be drilled. A hydrogeologic characterization would not be realistic with only two holes, so this aspect is receiving less attention. Langseth suggested that the drilling might be in the recharge zone and thus avoid higher temperatures in the upper part of the section. Brass commented that there would still be high-temperatures near the magma chamber.

Natland said that based on his experience on Leg 54 and later cruises, the results of Purdy's survey of the rubble zones at depth will have no effect on site locations, since it is the rubble zone at the surface that has the largest consequences for drill bit life and you can get only 20-30 m of penetration in rubble. The only way to get stability in the upper part of the hole is to drill in fairly thick and unfractured lava flows. Natland suggested putting in the minimum amount of BHA, because if we could drill 150 m with the present rotary system there would be no use in developing the DCS to drill and core in fractured rocks. Storms said that by casing off a rubble zone with the BHA to avoid having rubble fall into the hole, the bit life and penetration rates should be improved. Natland asked what was the concept for the pilot hole and how would it be drilled. Storms said it is a bare-rock spud into the formation with the BHA and a mud-motor to see how much penetration can be obtained, so the correct amount of BHA can be made up for the hole for the DCS. Brass said DSDP results suggest that in rubble you do not get any significant penetration, but in massive flows you get penetration but the bits wear out very soon; you will be lucky to get 10 hours of drilling from a bit. Storms said that the bits have been significantly improved to enhance their life, but he agreed that 20 m of penetration is probably all that can be expected. Storms said that if they can drill and core another 100 m with the DCS then

there would be enough hole to do as the DPG thought and make some slimline logging runs, especially to establish a temperature gradient.

Brass suggested that the best location for the sites would be in topographic lows with sheet flows, which will require local-scale seafloor surveys. Duncan asked if there was enough known about the surficial geology of this area to locate massive flows. Austin said that Fornari and Haymon have extensive electronic still camera images of the bottom in this area. Collapse features from 10 to 15 m across are observed which raises the specter of losing a guidebase.

Natland asked if the DPG had recommended the establishment of one or two holes as their priority. Austin said it was his reading of the DPG that they thought that at this time it was most important to establish the one off-axis site for the science drilling leg. Austin said the DPG debated if a science party was needed on the Engineering Leg. Moberly said that the original concept of the Engineering Leg was to spend some time preparing to drill at 504B and deploy guidebases at the EPR without needing a science staff onboard; now the ideas being proposed suggest that more time is needed to prepare for the science drilling leg. PCOM needs to make some decisions about where this leg is headed. Storms said that it is estimated that about one-half of a leg would be needed to set two guidebases and start holes; establishment of these holes on an engineering leg means that more time can be devoted to coring on the science leg. An engineering leg to establish two holes will also provide more information on the capabilities of the DCS system. Moberly said that there would still be a strong science component to the leg. von Rad said that it will take more than one science leg to drill the deep hole. The EPR was identified as a long-term science laboratory from the beginning.

Langseth asked if the DPG would meet again. Moberly said that they were asked to choose between the two proposals, which they have done, and to prepare a drilling plan, which they may or may not have done. Austin said that it may require another meeting to examine the sites in more detail. Langseth said that he thought that the DPG needs to look at the balance between the science that might be achieved and the engineering objectives for setting the guidebases.

841 General Direction of the Vessel for the Next 4 Years

The major item of business for this meeting was to determine a general track for the *Resolution* for the next four years. Programs from any ocean were in competition and had been ranked by the four thematic panels. A review of the rankings of programs by each thematic panel was led by the PCOM liaisons to the last panel meeting. A summary of these rankings is given in Appendix G. In addition PCOM needed also to consider advice from other panels, the Science Operator, and Wireline Logging about such factors as: engineering preparedness; logging (and other tools) preparedness; status of

site surveys; weather or clearance problems. PCOM was also to consider: balance among scientific themes, at the panel level and within panels; balance between the extremes of (a) transiting from the highest-ranked program to the next-highest, in any ocean, and (b) picking up all programs in an area before leaving that part of an ocean; balance in temporal aspects, between (a) interval since a drilling vessel was last used for the scientific interests of one part of the community, (b) commencement or continuation of long-term, multi-hole programs that may chiefly concern one part of the community, and (c) objectives of COSOD I, COSOD II, and the Long Range Plan.

Austin suggested that the first order cuts for determining the general direction of the vessel is to look only at the top 5 ranked programs from each thematic panel. Leinen said that PCOM needs to make sure that the panels have the opportunity to get their top-ranked programs drilled. This includes having the vessel in the right areas with sufficient time and giving the panels the resources (e.g. DPG) to develop programs that are not mature. In order to set the general track she suggested some criteria for making difficult decisions: 1) Each panel should expect to see at least 1 leg from each of their 2 highest-ranked programs drilled over the next four years regardless of multiple panel interests; 2) It is better to devote more than one leg of drilling to a top-ranked program than to drill a lower-ranked program; and 3) programs of interest to more than one panel that are highly-ranked should also be considered. The priorities of the thematic panel should guide the allocation of resources.

Brass said that at this point PCOM needs only to set the general ship track; programs remain in competition for drilling time. Lancelot said he agreed with the general statement by Leinen. The track of the ship, engineering developments, site-surveys, weather windows and other factors will eventually determine what gets drilled. By setting the general ship track, PCOM will be telling the panels where to put their efforts over the next four years. Austin said that the implications of the statement by Leinen is that we are willing to accept less efficient use of the vessel by long transits and by-passing of some areas of lesser interest. Cowan was concerned that PCOM may not be democratic in its allocation of drilling time, so we may not be able to drill all high-ranking programs. Leinen said that PCOM needs to adhere to the thematic rankings of the panels to be consistent with what we told the community.

Brass said that PCOM may be trying to over-constrain itself; all that is required at this meeting is a general ship track and not a 4-year drilling site plan; PCOM needs to leave opportunities open for program development and new ideas. The community needs to know where the ship is going so that they can continue to improve old proposals or submit new ones. Moberly said that the general ship track will also allow funding agencies to know where to fund site-surveys, what instruments to develop, how to allocate ODP resources. The track will be pinned down on certain points by the weight of

programs in that area, but this does not mean that these will all get drilled or others might not replace them. Malpas said that PCOM needs to adhere to the thematic advice given by the panels. A few fixed points are needed in the track, and these should be based on the thematic rankings. Leinen agreed that the track should focus on a few fixed points.

von Rad asked which parts of the next four years to April 1994 were relatively fixed and which parts were open. The FY 1990 program is set and being drilled, the FY 1991 program plan and the rest of 1991 have been planned but there are suggestions for modifications in the Engineering 3 Leg. For the purposes of this meeting, PCOM needs to set the ship track for 1992, 1993, and 1994 until April. The program plan for FY 1992 will be set at the next Annual meeting.

Malpas suggested that time constraints are useful for focussing thinking and loops may take away from this; the general track of the vessel should be to areas rather than specific sites. There are approximately equal numbers of programs in the Pacific and North Atlantic that are ranked very highly. Malpas suggested that the time should be divided about equally between the two areas. He suggested that the order be based on what is drillable at this time and therefore there be two more years of drilling in the Pacific followed by two years in the North Atlantic.

von Rad said that he had a similar idea to that of Malpas, with drilling in the Pacific including Chile Triple Junction, Cascadia, Sedimented Ridges 2, Hess and the Oahu pilot hole. Drilling would next move to the North Atlantic based on the highly-ranked programs located there. This would include drilling in both oceans of programs with the highest rankings.

Lancelot said that a proposed track in these two areas would address the highest scientific priorities of the thematic panels and satisfy any parochial interests in the Atlantic. The decision would be based solely on the scientific merits without any political considerations.

Cita said that the time should be shared between the Atlantic and the Pacific based on the weight of the rankings of the programs.

Jenkyns said that the Caribbean would provide an appropriate hub. He was concerned that the highly-ranked Atolls and Guyots programs would probably get ignored because of the geographical bias caused by the long transit times.

Suyehiro said that a track in both the Pacific and Atlantic would satisfy the weight of the rankings by the panels.

Austin thought that ship tracks radiating outward like a wagon wheel from a central eastern Pacific hub would be the most appropriate. Long transit times have to be considered.

Natland was concerned that the preparedness of the Atlantic programs for drilling was not being taken into account. More time should be allowed for preparing the Atlantic programs for drilling. There are more Pacific programs in the top 10 than Atlantic programs, and many of these are ready to drill. Jenkyns said that this readiness was because the Pacific programs have had more time to be developed and therefore it would not be fair to compare them on the basis of preparedness. Langseth agreed that the Eastern Pacific has had a longer time to prepare and thought that a 1993 target for the Atlantic was appropriate. Natland said that the Atlantic passive margin drilling is very ambitious and more work needs to go into establishing the best drilling approach before the ship goes there. Cowan said that they could be drilled now and provide as much new information as came from past drilling on Leg 104 and during DSDP. Tucholke said the Atlantic proposals are in the same state that the EPR proposal was 3 years ago. He said he does not see an equal balance between Atlantic and Pacific drilling and was concerned with the loss of drilling time due to long transits.

Leinen thought that just the top-ranked programs should get drilled. Jenkyns said that the top-ranked program of each panel should get drilled. Jenkyns was also concerned about the scoring - *i.e.* does a program that is, say, rated very highly by 2 or more panels score as highly as one rated top by 1 panel only. Moberly asked if drilling the top-ranked programs of each panel means an exact 25% split of the time or do we include programs of multiple panel interest which will distort the balance.

Malpas suggested that the general ship track should focus on two areas, the North Atlantic and Pacific, based on the present rankings by the thematic panels. Planning should be for approximately 15 months of Atlantic drilling, this will help to focus further planning for these programs. Lancelot agreed with this suggestion provided that it was understood that only the best science will be done. Malpas then proposed the following motion which passed unanimously.

<u>PCOM Motion</u>

Recognizing the thematic priorities of the advisory panels, the Planning Committee has decided that the *JOIDES Resolution* will operate in two areas in the four years beginning April 1990, *i.e.* the Atlantic Ocean north of the equator and the Pacific Ocean. A preferred scenario is that the ship will continue in the Pacific until October 1992 and transit then to the Atlantic for a program that will continue through the completion of this 4-year plan. (Motion Malpas, second Brass)

Vote: for 16 ; against 0; abstain 0

Leg 127 Japan Sea 1

Co-Chief Scientist Ken Pisciotto described the results of Leg 127 in the Japan Sea, one of the best known backarc basins in the western Pacific. Legs 127 and 128 were designed as a multifaceted drilling program to better constrain the tectonic, sedimentary and paleoceanographic history of the basin. The principle objectives of Leg 127 were to discover the age and nature of the basement, opening history of the Japan Sea, the dynamics of opening, paleo-environmental history, the present stress field in a developing plate boundary, and preparations for long-term borehole seismometer experiments.

Recovery of sediments were generally good, averaging between 52-65%, with the HPC providing significant improvements over Leg 31. Acoustic basement was reached and found to be interbedded sediments and basalts. Abundant volcanic ash layers were found and will be helpful for dating, especially since microfossils are absent in cores below 300 mbsf. There is a good magnetic reversal stratigraphy back to 5 my. Sedimentological studies indicate a rapid dropping of the basin following rifting at 19 my. Extensive deltaic sediments built out into the basin as it continued to widen and deepen. About 1.8 my ago the basin began to close and the Okushiri Ridge was obducted. Evidence for the presence of clathrates were found in some cores.

Leg 128 Japan Sea 2

Co-Chief Scientist Kiyoshi Suyehiro described the goals and results of Leg 128 which was the second leg of the multifaceted Japan Sea program. Primarily goals for this leg were drilling on the bathymetric highs for recovery of undisturbed sections for paleoceanography, collection of cores for bacterial activity studies, drilling in a failed rift to study metallogenesis, and make geotechnical measurements. Sediment cores provided detailed depositional and uplift history of the Okushiri Ridge, and cyclic deposits for detailed studies of Quaternary paleoceanography. Drilling in the failed rift which is similar to that inferred for the Kuroko deposits in Japan, did not find the massive sulfide deposits expected. Unusual sediments found included glauconite sands and rhyolitic tuff sands. Logging results have revealed a 41 kyr Milankovich cycle for the cyclic light and dark sediments extending back to 2.5 my.

The downhole seismometer experiment was designed for a high resolution study of seismicity in the Japan Sea including earthquakes and teleseisms. The data package will be recovered by rope after being released by an acoustic signal. The seismometer was initially tested in real-time using a second ship as the seismic source. The initial results indicate that the noise level recorded by the downhole seismometer is higher than quiet land stations but clearly lower compared to an ocean bottom seismometer. The electrical resistivity

experiment indicated that the Japan Sea has relatively cold lithosphere and upper mantle.

Leg 129 Old Pacific Crust

Co-Chief Scientist Yves Lancelot summarized the results of Leg 129. The main objective of this leg was to recover Jurassic sediments and the volcanic basement from the Pigafetta and East Mariana basins of the western Pacific. There has been extensive efforts extending back to Leg 6 of DSDP to get through the cherts and extensive basalt flows and recover the oldest open-ocean sediments and ocean crust. The chert problem was solved but the massive volcanogenic layers have frustrated efforts to penetrate basement. Windows through the basalts were needed and eventually identified by new seismic work and improved maps of the magnetic anomalies.

The first site drilled in the Pigafetta basin found clay, chert, carbonates, volcanogenic turbidites and Cretaceous volcanic flows. The second site 801 was finally successful in penetrating to igneous basement and recovered Tithonian-Callovian sediments. A reentry cone was set and this site was later reoccupied and drilled deeper into basement. The site in the East Mariana basin drilled volcanic tuffs, redeposited sediments, carbonates, upper Cretaceous volcanogenic sediments, and Cretaceous extrusive basalts. Reoccupation and further drilling at 801C cored an extinct hydrothermal system similar to the one in Cyprus. Jurassic radiolarites were recovered and are similar to the Tethyan in the Alps. Hole 801C is clear and cased to basement and ready to be reoccupied for further drilling and logging.

PCOM congratulated Drs. Pisciotto, Suyehiro, and Lancelot for their success, and thanked them for their presentations.

843 Modifications to the FY91 Program Plan

Suggestions were made earlier in this meeting that changes in the timing of the Engineering 3 Leg be made for scientific reasons. The Science Operator had also previously suggested some modifications for budgetary and engineering development reasons. BCOM had shifted SOE money to the DCS which helped solve the budgetary problem. ODP-Engineering is still concerned that following Leg 132 the DCS will be at TAMU for only 4 months before the system needs to be shipped for Engineering 3B. Sufficient time for improvements in the DCS system may not be available.

Kappel said that T. Pyle recommends the Oahu Pilot Hole be included in the FY91 drilling following Leg 135. This would show a commitment to cooperate with other international geoscience programs.

Leinen said that a simple reordering of legs is different than the addition or the subtraction of a leg. The suggestion by the EPRDPG suggests that a delay

in the Engineering 3 part at the EPR is appropriate. Moberly said that reordering will mean moving the Eastern Equatorial Pacific Neogene Transect to earlier in the schedule. Natland said that the changes proposed for Engineering 3B will make this leg about 55 days which means a full leg length of activity. Storms said that the 55 day length for Engineering 3B can be adjusted by the types of activities planned and the depth to which the BHA is drilled into the formation. Austin said that for the Engineering 3B Leg the EPRDPG now favors the establishment of the deep off-axis hole rather than setting two guidebases. Storms said that the one site would be sufficient for the engineering development tests.

Brass suggested that Engineering 3B be delayed and that the Oahu Pilot Hole be moved into the schedule. Cita said that the Oahu pilot hole should be moved into the schedule as soon as it is appropriate. This project involves a large scientific community whose support will be of value to ODP.

Leinen said she supports cooperation with other programs but thought that the Oahu pilot hole does not have high enough support to justify moving it into the FY91 schedule. It is a bad signal to the thematic panels and to the whole community that we are adding something not in the top few priorities. Jenkyns said that if ODP is going to ally itself with other global programs, exactly the same argument could be made for moving Atolls and Guyots into the schedule since it is of interest to international programs whose support should be courted.

Lancelot said that he thought that the Oahu Pilot Hole had good support from TECP but he agrees with Jenkyns that other programs could equally well be moved in for similar reasons. The Oahu Pilot Hole will give ODP a high return of good will with only a small investment from the program. Langseth said he was in sympathy with ODP showing good faith but that PCOM should not be stampeded into putting this program into the FY91 schedule, since it could also be done in 1992. Tucholke said that he was in sympathy with Jenkyns point-of-view and that other programs such as the North Pacific Neogene should be considered. The Oahu Pilot Hole does represent a contribution by ODP to what could be a very important international program that will reveal fundamental geodynamic processes.

Leinen said that the panels should have the opportunity to evaluate this program against others. Lancelot pointed out that the proposal was evaluated by TECP and LITHP in competition with these other programs. Natland said that there should be a direct science return for ODP for drilling the Oahu Pilot Hole; ODP should not be in the position of having to encourage funding for the other study. Tucholke disagreed and said that the persons involved in the Oahu Pilot Study felt that they had to have a commitment to have the hole drilled before they could honestly put in a proposal to do the pilot study. This proposal has been in the system for some time and it is now time for

PCOM to give them an answer about cooperation. von Rad said that the project has strong support in the German seismology community and ODP should decide if it will support drilling the hole in the next two years of Pacific drilling. Suyehiro said that he thought that the Oahu experiment was good, but there would be some risks associated with putting the seismometer down the borehole.

Moberly said that with now a fixed date to leave the Pacific these extra days will displace a program of higher rank. Also, there have been unexpected delays because of the Singapore drydocking and additions to the Vanuatu leg. Langseth said that it looks reasonable to delay Engineering 3B at the EPR and shift programs around. Malpas agreed and suggested that the preferred scenario for the four-year track be changed so that the Pacific drilling is extended by one-half of a leg to do the Oahu Pilot Hole. He said that there was sufficient flexibility built into his motion to allow this. Austin asked if the changes proposed for the Engineering Leg at the EPR would make it more of a joint science and engineering leg. Moberly said that would depend on what PCOM decides to do with the leg (further discussion in Minute 846).

PCOM Motion

Following transit from the Lau Basin, a FDSN Test Hole north of Oahu will be drilled for a pilot study for an oceanfloor seismic station. This drilling is to be followed by the following legs in the order: Engineering 3A at 504B, Eastern Equatorial Pacific Neogene Transect, Sedimented Ridges 1, either 504B (if Engineering 3A is successful) or Engineering 3B at the East Pacific Rise (if Engineering 3A is not successful). Engineering 3B will follow 504B if Engineering 3A is successful. (Motion Natland, second Cita)

Vote: for 13; against 0; abstain 3

Brass said that the proponents for the Oahu Pilot Hole should submit a more detailed proposal for evaluation by the thematic panels. Decisions will have to be made about siting and coring. Meyer said that a cruise prospectus may not be prepared if there is no plan for coring. von Rad said that he thought there should be a thorough review of the proposal by TECP and LITHP who provided the support. Some science for ODP should come from this drilling.

Thursday, 26 April 1990

844 Preparation of the FY 1992 Prospectus

In order for PCOM and the thematic panels to have a set of information for evaluating programs for inclusion in the FY92 program plan, a prospectus needs to be put together by some group. The programs will come largely from those given in the latest CEPAC prospectus with the addition of several other Pacific programs ranked highly by the thematic panels. PCOM must decide who is to prepare the prospectus and what programs to include.

Natland suggested that the thematic panels could coordinate with the proponents of the additional programs to produce a document. von Rad said that a group selected from the thematic panels could prepare a document. Leinen objected that this could be considered a conflict of interest since the panels would also have to evaluate the programs. Austin said that a competitive atmosphere should be fostered.

Natland said that it is essential that some group with the appropriate knowledge calculate the time required to do the science and set some priorities. This was coordinated by the regional panels in the past and more recently by a DPG. Duncan said some uniform level of preparedness is required; something that includes primary and alternate sites, drilling and logging times, priorities and contingencies. Leinen said that the consensus at the WHOI meeting was to form a DPG to do this task.

Brass suggested that since most of the programs have been updated for the most recent CEPAC prospectus, that the JOIDES Office could coordinate the addition of the Peru Gas Hydrate and Hess Deep programs to this prospectus. PCOM would ask the proponents of these two programs to bring them up to the status of the other programs in the prospectus in time for preparation of a prospectus for evaluation by the thematic panels this fall. PCOM agreed that this was the best approach with the amount of time available.

845 Preparations for Drilling Beyond FY 1992

In order to prepare for drilling after FY 1992 various Detailed Planning Groups and Working Groups have been suggested.

Natland suggested that four were needed: a Volcanic Margin Working Group, a Sealevel Working Group, the Deep Drilling Task Force, and an Offset Drilling Strategy Working Group.

Cita proposed an Accretionary Prism Working Group to develop a coherent strategy for prism drilling. Langseth said that the Fluid Processes in Accretionary Prisms Working Group had prepared a report outlining drilling strategies. Brass thought that TECP should consider how best to approach developing a drilling strategy for accretionary prisms. Lancelot agreed that TECP needs to rank drilling prisms against one another and develop an approach that will have a coherent strategy. Brass said that SGPP also has a strong thematic interest in drilling accretionary prisms. Cowan said that TECP and SGPP will have an overlapping meeting in Paris next fall and it would be an appropriate charge to have them consider how to develop a coherent strategy. PCOM agreed that this was appropriate.

Langseth said that LITHP should be charged to develop a strategy for drilling offset sections. Duncan said that this has been done already by the JOI/USSAC workshop on Drilling the Oceanic Lower Crust and Mantle

convened by H. Dick. Brass said that LITHP and TECP should take this document and work together to develop an integrated approach. Natland said that there are 8-10 places where the deep crust can be studied by offset drilling and a group is needed to pick the best places to do this. Leinen and Lancelot thought that choosing the place was best left to the panels. Brass said that LITHP should be charged with making recommendations for establishing an approach for drilling offset sections. PCOM agreed to the suggestion.

Leinen said that importance of Deep Drilling for the future of ODP requires some group to be charged with this responsibility. Lancelot agreed that it was very important for ODP to move ahead on this matter. Natland said that it was important that TEDCOM provide its input. The following motion was made.

PCOM Motion

> The Planning Committee recommends the formation of a Working Group on Deep Drilling. PCOM requests that the PCOM Chair consult with the TEDCOM chairman and thematic panel chairmen to formulate an appropriate membership and mandate for the Working Group for presentation to PCOM at its August 1990 meeting. (Motion Brass, second Leinen)
>
> Vote: for 16; against 0; abstain 0

Brass suggested that a Sealevel Working Group was needed to focus generalities on to the actual Ocean Drilling Program. Watkins said that the report of the El Paso workshop would be out in a few months. The Conclusions section is finished. Moberly requested that the Conclusions section be sent to the chairmen of the four thematic panels. Lancelot asked what would be the mandate of the group. Brass said that they would formulate an integrated strategy for studying sealevel change by drilling. PCOM agreed to consider the formation of a Sealevel Working Group at its August meeting after the results of the El Paso workshop are examined by the thematic panel Chairmen and suggestions are made for an appropriate mandate and membership for such a group.

Lancelot suggested that PCOM form a Rifted Margins Working Group. Austin said that there has been a JOI/USSAC Workshop proposed to look at the problems of volcanic margins. Brass asked if the workshop should be followed by a DPG. Brass said that PCOM is planning for 15 months of drilling in the North Atlantic beginning in about 2.5 years, so we need to begin planning this drilling as soon as possible. Austin said that the decision about whether it will be a volcanic or a non-volcanic margin drilling program will affect the strategy. von Rad said that TECP and LITHP have suggested a membership for a Volcanic Rifted Margin Group which includes persons who would be on any group regardless of whether it was a volcanic or a non-volcanic margin drilling program. Austin said that nominees are needed for

a more diverse and less specialized group. Tucholke said that he does not think it appropriate to have a combined volcanic and non-volcanic margin group. Volcanic margins require a working group to sort them out since there are many proposals in different areas. The North Atlantic non-volcanic margins are a different group of persons looking at different problems. Strategy and tactics are needed for approaching these different problems. Two DPGs would handle making plans faster. von Rad said that providing manpower for two such similar groups could be a problem for the non-US partners. Lancelot thought that the one group to evaluate both volcanic and non-volcanic margin drilling programs was needed to get the work started and to make choices between the competing proposals. Malpas said that there are time limitations on what can be drilled and therefore competition for drilling time. A single group can come up with a focussed multiple-leg drilling program that will be in competition with other programs in the North Atlantic. Leinen suggested that the DPG be divided into subgroups that can meet separately if needed. The following motion was made.

PCOM Motion

> PCOM establishes a North Atlantic Rifted Margins Detailed Planning Group combining expertise on volcanic and non-volcanic margins, the chairmen of the thematic panels will be consulted about possible members and PCOM will set membership and establish the mandate for the DPG at the August 1990 meeting. (Motion Natland, second Brass)
>
> Vote: for 15; against 0; abstain 1

When the mandate for the DPG is formulated it will be decided if the DPG should be looking at conjugate margins. The non-US partners should be prepared to name persons to the DPG if they wish.

In order to prepare for North Atlantic drilling another DPG was suggested for integrating the North Atlantic Arctic Paleoceanographic Gateway proposals.

PCOM Consensus

> After consultation with the thematic panels, a North Atlantic Arctic Paleoceanographic Gateway Detailed Planning Group will be formed and staffed at the August 1990 PCOM meeting.

Since two DPGs are going to be formed to work on North Atlantic proposals, PCOM decided not to form an overall DPG for this area at this time. Brass and Leinen suggested that the proponents of the top ranking proposals (top 5 Atlantic ones) from each panel be requested to bring their proposals up to prospectus style. PCOM, after discussion about how to keep programs progressing towards maturity and keep them competitive, came to the following consensus.

PCOM Consensus

The proponents of the top-ranked Atlantic proposals are to be informed that they should be endeavoring to bring these proposals to maturity so that they will be ready if chosen for drilling.

846 Strategy for Engineering Leg at 504B and EPR

The Engineering 3 Leg has engendered considerable discussion after the last PCOM meeting. At present, as in the approved Program Plan, there will be two components in preparation for lithospheric drilling in the eastern equatorial Pacific: 1) an attempt to clear the junk at the bottom of hole 504B so that it can be deepened to layer 3; followed by 2) setting of two hard-rock guidebases on the EPR at sites to be named by the EPR-DPG and approved by PCOM, so that the EPR bare-rock work can progress. Considering earlier recommendations from LITHP, PCOM decided that there would be a minimum of scientific work on what would be essentially an "engineering operations" leg. Considering the transit time, the Science Operator asked that the leg be split in two parts by a Panama port-call.

Various proposals have suggested that deepening of 504B be: 1) by milling followed by coring to layer 3; 2) by whip-stocking and re-drilling the lower part of 504B; or 3) by spudding a new hole near 504B. If a new hole is required, proposals have been: 1) drill close by, so that the upper part can be considered a near-duplicate to the present TD of 504B, then core deeper; 2) core close by, to and deeper than the present TD of 504B; 3) choose a place in the near vicinity (few km) to core to the top of layer 3; and 4) abandon the 504B area and choose a better place in any ocean for obtaining the layer 2-3 transition and the upper part of layer 3.

There have been recent panel requests to extend the time of Leg 136 to allow more coring and logging. Most recently LITHP has proposed the following for Engineering Leg 3A at 504B: after reentry, log temperature, sample fluid, and measure permeability; then mill (and fish or both). If the hole is cleared with time remaining, core ahead. If it becomes obvious that clearing will be unsuccessful in the allotted time, the remaining time should be devoted to as full a logging program as possible. DMP has made similar recommendations for logging with the exception that they propose a more extensive logging program before casing the hole in place of coring ahead.

Malpas asked why the whip-stocking option is no longer considered a suitable option. Storms said that with whip-stocking the chances of drilling ahead more than a few tens of meters is low; the bend causes many problems with the drill string and casing. Storms said that the Engineers feel that the best chance for getting deeper is by drilling another hole without coring. Duncan said that LITHP does not support that option and prefers the milling option at this time. Storms said that it will be known within 14 days if milling will

work. Natland asked what will be done if 504B cannot be cleaned. Moberly said that LITHP has considered the options and recommends that additional logging be done along the lines of DMP recommendations. Langseth said that DMP has some suggestions that are different from LITHP. DMP recommends there also be sidewall coring. Jarrard said that ODP has not done hardrock sidewall coring. Langseth suggested that DMP recommendation #8 about measurements before recasing be accepted. PCOM agreed that hole 504B should not be recased prior to making the DMP suggested measurements, but these measurements do not have to be done on the Engineering Leg. PCOM passed the following motion.

PCOM Motion

PCOM accepts the LITHP recommendations for logging, milling operations, and drilling ahead at 504B. (Motion Leinen, second Brass)
Vote: for 14; against 0; abstain 2

LITHP has recommended the following for Engineering Leg 3B at the EPR: Rather than deploying two old-style large and expensive bare-rock guidebases with no actual coring, there should be, if possible, establishment of two or more drill sites on the EPR using one of the recently designed options. The use of "pogo" mini-guidebases and drill-in casing has been suggested, that presumably would leave sealed holes, cased by the abandoned BHAs, cored to about 50 m depth. They would be ready for further deepening on future legs. If these new techniques are unsuccessful, Engineering 3B could be used to try an array of others. The consensus of the EPRDPG was that the focus for the engineering leg should be the establishment of the deep off-axis hole.

Brass was concerned that the length of the Engineering 3B leg is approaching 60 days and is no longer just an engineering leg. PCOM therefore requested that before the August PCOM meeting, ODP-TAMU Engineering provide a list of options for the leg with associated time requirements. At the August meeting, PCOM will decide what to do with the Engineering Leg at the EPR.

847 Recommendations on Publications

IHP has made a number of suggestions concerning problems pertaining to publication of the "Scientific Results" volumes including: enforcing deadlines; keeping Editorial Review Boards; having the staff scientist act as an on-site expediter for the volume; and appointing an additional outside ERB member at the request of the ERB chairman to lessen the load, which were mentioned previously in Minute 837.

Duncan said that some of the suggestions have been already accomplished by TAMU. Communication among the 4 members of the ERB is difficult and he thought a meeting of the ERB at a late stage is a good recommendation. Meyer said that a second outside member will not help improve

communications. Moberly said that the idea was to lighten the load on the Co-Chiefs so they can write their syntheses. Lancelot thought that giving more control to the staff scientists should help improve communications. Lancelot said he did not think adding a member to the ERB would help, since the Co-Chiefs need to read the manuscripts in any case.

Duncan said that the load related to reviewing manuscripts is not a problem, it is more of a problem getting the manuscripts in time to write the synthesis. Meyer said that this is not a problem that will be solved by moving ODP Publications under Science Operations. von Rad said that having another person looking at the manuscripts will not speed up getting them to the Co-Chiefs. Austin said that PCOM should wait and give the changes already made some time to work before making further changes. Watkins said that PCOM asked IHP to look at the ERB and they have done so; IHP has made a recommendation to keep them and PCOM should accept it.

PCOM Motion

PCOM recommends the continuation of the Editorial Review Boards. (Motion Watkins, second Natland)

Vote: for 16; against 0; abstain 0

PCOM was concerned about the loss of synthesis papers from the "Scientific Results" volumes. Watkins said that the burden placed on the Co-Chiefs should be lessened. The staff scientists should be given more responsibilities to help expedite manuscripts. Lancelot suggested that manuscripts should not be rejected without the concurrence of the staff scientist and Co-Chiefs. Duncan said that the major problem comes from the late submission of manuscripts. The new system of post-cruise meetings should help solve this problem to the extent that the synthesis can be started after this meeting. von Rad suggested that some mechanism is needed to ensure that there is some time to finish the synthesis after the manuscripts come in. He suggested the following and PCOM concurred.

PCOM Consensus

In order to encourage the inclusion of synthesis chapters in the "Scientific Results" volumes, PCOM suggests that the deadline for the synthesis chapters be 3 months after the submission deadline for the last manuscript for a volume.

Plans for the meeting of the former Indian Ocean Panel and Indian Ocean Co-Chief Scientists were reviewed by Duncan. The plans for the meeting are proceeding. The meeting will be in late June or July of 1991 in Cardiff Wales and will be hosted by R. Kidd. Participants will write synthesis papers along thematic lines for publication in a volume. Negotiations with AGU are proceeding for a Monograph series. AGU wants to know who will be the editors and have a Table of Contents before agreeing. D. Rea and R. Duncan

will probably edit the volume. There is a proposal in to JOI/USSAC to fund participation in the workshop by US scientists.

Moberly informed PCOM that B. Taylor is willing to organize a thematically based meeting and volume on Western Pacific drilling. He wants to wait until at least the final three legs of the program are drilled (NE Australian Margin, Vanuatu, Lau Basin-Tonga).

848 Criticisms of the JOIDES Advisory Structure

The following topics show the range of recent criticism of the existing structure and policy of the program. They appear to be as important in some minds as the topic of outside membership on EXCOM and PCOM.

- Adequacy of current review procedures, including outside reviews of novel proposals; concept of maturity meaning multi-channel seismic lines as illustrated by K. Hsü correspondence.

- Importance of program, both absolute and relative, to other earth-science initiatives as illustrated by R. Coleman correspondence.

- Lack of economic or applied science aspects to ODP drilling as illustrated by D. Sangster letter.

- Co-chief selection and responsibilities; cruise prospectus as illustrated by letters from R. Larson and Y. Lancelot, and R. Wilkens.

- Lack of long-term commitment *i.e.* select best area and return until problem is solved as illustrated by P. Robinson letter.

Leinen said that in regards to the letter by Hsü, there is a difference between being open to new opportunities and not being supported by a thematic panel. Langseth said that the review processes have changed as well; now all proposals get reviewed by the thematic panels. JOIDES has responded to this criticism. Brass said that JOIDES has made many changes, including eliminating regional panels and making sure that proponents get feedback from the panels. Tucholke asked if there was a policy about written reviews to proponents. Moberly said that a year and one-half ago changes were made to send proponents a written response from the four thematic panels. Tucholke said that the negative points brought up by Hsü should be refuted in a letter showing the changes in the program that have been made to solve these problems.

PCOM affirmed its earlier policy for itself and JOIDES thematic panels that, during discussion and voting (ranking) of a proposal, any of the proponents listed on a proposal who are present as members or guests must leave the room. Further, PCOM agreed that it is not proper at a meeting that will lead

to voting to ask a member or guest who is a proponent for a "summary" or "clarification" of some point, because proponents of other proposals (being absent) do not have the same advantage of direct communication with the panel. If more information is needed, there are mechanisms in place for proponents to respond.

PCOM Consensus

> Proponents should not be present during the part of the panel meeting when their proposals are being reviewed or ranked.

Cowan said the comments made in Coleman's letter are extremely important for ODP. Coleman's opinion represents that of a large community of scientists who do not work in the marine geosciences, who have low operating budgets and view the large budgets for the ocean sciences as a drain on their funding. It is a community that needs to be reached and shown the benefits coming from ODP. Leinen agreed that it was a disturbing letter. ODP has not made an effort to reach out to other segments of the geoscience community. There has been some effort to form liaisons with selected other international programs that have overlapping interests with ODP, but EXCOM needs to take a lead in reaching out to other groups and help show the benefits of ODP science. A steering committee concept needs to be adopted, and EXCOM should help establish relationships with other geoscience initiatives. EXCOM members commonly operate on a different level than PCOM members do. Lancelot said that the problems are caused by the lack of advertising of the progress being made by ODP in tackling great science problems. ODP needs to lobby for the science that is being done. We also need to highlight some new initiatives that are in the forefront of science and which can reach out to other global programs. The LRP did not do this in an effective way. ODP needs to develop a higher profile with some public relations work. Malpas agreed and suggested that ODP should use the experience it has gained in 25 years of operation to provide leadership for other programs. Langseth said that there appears to be a misconception about the exciting science being done by ODP. Leinen suggested that JOIDES form a group to act as a spokesman for the science that is being done by ODP. EXCOM needs to be educated about the specific links that need to be formed to integrate ODP into these other global initiatives.

Malpas said that there is a malaise effecting ODP as a whole and within the Canada-Australia Consortium. There is a need to show that ODP is still doing first-class science and to integrate our initiatives with other international programs. There is a need to educate other scientists about ODP.

von Rad said that ODP in Germany has prepared it own LRP to show what is being planned and how it compares to other programs competing for funds. ODP is superior to these other programs.

Jenkyns said that ODP is well thought of in the UK. It is attractive to the land geological community from which many participants on drilling legs come.

Suyehiro said that although the program is well-supported by oceanographers, there is a larger geoscience community in Japan and there may be some problems getting support for renewal after 1993.

Cita said that the ESF Consortium considers the program to be very strong with new science being attempted. There are many active participants in the drilling program.

Lancelot said that there is a large geoscience community support in France but new initiatives are competing with ODP for funding. Unless there is a change and some new high-profile initiatives such as deep drilling and global change are highlighted, there may be some problems with renewal after 1993. Constant funding has been interpreted in France as a lack of continued interest in the advancement of the program by the US NSF.

Leinen said that these comments are disturbing and suggest that JOIDES needs to improve its image. She suggested that a subcommittee be formed to develop strategies to help with the renewal efforts. Malpas said that an effort should be made to educate others about what the successes of ODP have been and the directions for the future; something similar to the NSB presentation. This group should be sent to the member country funding agencies and other geoscience initiatives. Brass said a ringing endorsement of ODP from EXCOM is needed.

PCOM Consensus

> PCOM was in consensus that a small *ad hoc* subcommittee be formed to aid the renewal process by developing strategies for generating excitement and publicity about the scientific advancements and technological achievements of ODP, coordinating presentations in the partner countries, countering criticism, identifying and strengthening weak points, and improving the image that ODP projects outside of the marine geoscience community.

Members of the subcommittee are J. Austin (chairman), M. Leinen, J. Malpas, R. Moberly, N. Pisias, and possibly a senior German geoscience administrator.

In connection with the letter by Robinson, Malpas suggested that the thematic approach will lead to more-sustained programs in one location lasting until a particular problem is solved.

Austin suggested that the issue of non-JOIDES Institutions having representation on PCOM be referred to the subcommittee for discussion with EXCOM.

849 Membership Changes on JOIDES Panels

Membership on the various JOIDES panels was reviewed and the following actions were taken.

LITHP Mark Zoback is to be invited to join the panel (alternate D. Moos) as the replacement for K. Becker with expertise in heat flow and downhole measurements. S. Humphris is to be asked to serve as the new chairman of the panel to replace R. Batiza.

OHP PCOM agreed to allow OHP to have 16 members for the fall meeting by asking A. Hine, J. Parrish (alternate L. Pratt) and John Barron to join the panel (assumes that Eric Barron has resigned). OHP will revert to 15 members after replacing W. Berger and D. Kent when they rotate at the end of 1990. G. Wefer will be the new member from the FRG. PCOM asked that for replacements, persons with expertise in the Mesozoic be considered for appointment by the non-US members.

SGPP P. Froelich and M. Goldhaber are scheduled to rotate at the end of 1990. Possible replacements were discussed by SGPP, but no nominations were forwarded to PCOM and no actions were taken at this meeting.

TECP Eldridge Moores is to be asked to accept the chairmanship of the panel after the Fall meeting when Ian Dalziel will be stepping down. Jan Behrmann will be replacing Karl Hinz for the FRG.

DMP D.M. Williams of Mobil Development and Research Corporation in Dallas, TX is to be invited to join the panel.

IHP Patty Fryer (new system of Results preparation) and Woody Wise (older system of Results preparation) are to be asked to join IHP as two recent Co-Chief Scientists. The Co-Chief positions will rotate more frequently, deepending on the rate of publication.

PPSP No actions taken. Lou Garrison will be serving on the TAMU safety panel after his retirement as Deputy Director of ODP.

SMP Hugh Jenkyns will see if Ellen Thomas can be supported by the UK as a member-at-large to the panel. [UK has agreed to support Thomas as a member-at-large.]

SSP Ann Trehu is to be asked to join the panel (Greg Moore is the alternate).

TEDCOM No requests and no actions taken. TEDCOM does endorse the attendance of liaisons from the thematic panels at future TEDCOM meetings.

PCOM Motion

PCOM accepts the slate of persons nominated to serve on panels. (Motion Brass, second Leinen)

Vote: for 14; against 0; abstain 1; absent 1

Since Central and Eastern Pacific Detailed Planning Group did such a good job updating the Third CEPAC Prospectus and in addition PCOM decided not to use a DPG to prepare the Prospectus for FY92 Drilling, the CEPDPG was disbanded with the thanks of PCOM to the chairman D. Rea and all those who have served on this former regional panel and DPG.

PCOM Motion

PCOM disbands the Central and Eastern Pacific Detailed Planning Group. (Motion Langseth, second Brass)

Vote: for 15; against 0; abstain 0; absent 1

In terms of its own disciplinary balance, PCOM noted that the area of sedimentary geochemistry is losing expertise due to the rotation of M. Kastner and the imminent departure of G. Brass. J. Austin will talk to A. Maxwell about writing a letter to US EXCOM members reminding them that this should be kept under consideration when appointing new PCOM members.

PCOM liaisons to meetings this summer will be: Langseth to the Cascadia DPG meeting; Cowan to the DMP meeting; and Watkins to the SSP meeting.

Membership of Joint Liaison Groups

The following JOIDES panel members are to be invited to be members of Joint Liaison Groups.

Liaison Group with the Federation of Digital Seismic Networks

Mike Purdy, Co-Chairman (Woods Hole) member of TECP

Jim McClain (Univ. California at Davis) member of LITHP

Liaison Group with InterRIDGE

Kim Klitgord, Co-Chairman (USGS) member of TECP

Jason Phipps-Morgan (Mass. Instit. Technology) member of LITHP

Liaison Group with Nansen Arctic Drilling Program

Decision deferred to the August PCOM meeting.

PCOM Motion

PCOM accepts the slate of persons nominated to serve on the Joint Liaison Groups. (Motion Leinen, second Brass)

Vote: for 15; against 0; abstain 0; absent 1

850 Miscellaneous New Business

Burden on Panel Chairmen

The amount of work placed on the chairmen of the thematic panels has begun to have serious consequences, one chairman has resigned and two others have indicated that they will be resigning in the next year. There is a lot of time-consuming work involved in reviewing proposals, preparation of the reviews, minutes, white papers, letters to PCOM, etc. Panel chairmen have been complaining that their personal scientific investigations have been suffering from the time commitments to JOIDES. The JOIDES structure has been through an exceptional period of change during the past two years, previously regional panels took some of the load of reviewing proposals and devising drilling strategies.

Leinen suggested that PCOM could be more liberal in forming DPGs to do the detailed planning. Cowan said that the reviewing process will always take a lot of time and effort. Brass suggested that the load might improve now that global planning has been done once. Austin said that he could foresee a continuation of the heavy reviewing and administrative loads placed on the panel chairmen. This is especially a concern for those on "soft money" who support JOIDES work at the expense of their own science. Brass said that it should not be the burden it was this past year. Langseth suggested that as the panels sharpen up their white papers and improve the reviewing process, they will become more efficient.

Austin suggested that a new set of guidelines for the preparation of proposals needs to be prepared, so that more mature proposals are submitted and the panels will not have to spend as much time soliciting more information. Crawford said that there have been a new set of guidelines published, which require an abstract and a summary of the proposed drilling. Leinen said that the letters sent to the proponents from the panels should specify what improvements are needed in order for the proposal to be considered again.

Leinen suggested that part of the problem is that panel decisions come up again and again for additional review at PCOM. Panels must continuously resell the science to PCOM after having once had it accepted. PCOM needs to stand by its decisions or if it changes them, provide compelling reasons. Brass said that PCOM makes the final decisions based on advice from different panels as well as its own perspective; it may not be possible to justify PCOM decisions for each individual panel. Austin felt that PCOM needs full accountability for its decisions.

Lancelot suggested that some method other than just minutes is needed to get the thematic panel chairmen involved in developing the program plan. Austin said that the panel chairmen deserve more than they are now getting.

GPS Station on Sabine Bank

PCOM discussed the letter from F.W. Taylor about placement of a Global Positioning Station on Sabine Bank to establish plate convergent rates. It was noted that the goals of this experiment would tie-in with the scientific goals of the Vanuatu drilling, however, since PCOM does not evaluate these outside proposals against one another, it cannot provide an endorsement. If the project is funded, PCOM thinks the science results would be of use for the Vanuatu drilling.

Distribution of JOIDES Proposals

Should a proposal that is not yet placed on the drilling schedule be sent from the JOIDES Office to anyone requesting a copy? Present practice is to tell the requester to ask the proponent directly. Presumably, once the proposal is "accepted" (in the Program Plan), it can be made public as with other proposals to public funding agencies.

Brass said that he was concerned about having proposals sent out without the knowledge of the proponents, because of the potential problems with unauthorized use of the data or ideas for other proposals. He suggested that anyone outside of the JOIDES structure requesting proposals that were not in the schedule should request them from the proponents. Once they are under consideration for drilling, as in a prospectus, they can get wide distribution. von Rad said he thought this was agreeable.

PCOM Consensus

> Once a drilling proposals is under active consideration for drilling it will become publicly available; prior to this, anyone outside of the JOIDES structure will have to make their requests for proposals directly to the proponents.

Multi-shot Orientation Tool

One of the recommendations of the Annual Co-Chiefs meeting was that the multi-shot orientation tool be run in all APC holes at low latitudes to improve the usefulness of cores for reversal stratigraphies. The time requirements are minimal, being about 5-10 minutes for an APC section. Langseth endorsed the suggestion and suggested that this will improve the scientific value of cores.

PCOM Consensus

> PCOM recommends that the multi-shot orientation tool be run at APC holes at low-latitude sites. At sites with multiple APC holes, decisions about additional runs beyond the first one will be made onboard.

Valu Fa Ridge as an Alternate Site

LITHP had suggested that the proposal for drilling ore deposits in the back-arc Valu Fa Ridge be considered for a back-up site during drilling on Leg 135 in the Lau Basin. This site was not considered when the prospectus was prepared and would represent another objective for a leg that is already full. Approximately 15-20 days of extra time would be required to drill at this site. Brass suggested that it was an acceptable alternate site, if for some reason the Co-Chiefs want another alternate site.

Routine Blind Whole-Round Sampling of Cores

SGPP has questioned the necessity of routinely collecting and freezing blind whole-round core samples for future organic geochemistry studies. SGPP has suggested that a study be made of the numbers and kinds of research programs done with these cores. PCOM requests that the Science Operator supply statistics on the usage of these cores for consideration by SMP. Leinen said that additional expertise in organic geochemistry may be needed. Moberly said that this can be covered by a request for a guest to attend the meeting.

PCOM Consensus

SMP in consultation with SGPP and the Science Operator will draft a policy statement on the routine blind sampling of whole-core cylinder rounds for organic geochemical analysis.

851 Future Meeting Schedule

The next meeting will be the 1990 Summer PCOM meeting in La Jolla from 14-16 August 1990 and hosted by Scripps. It is unknown at this time if a field trip can be arranged.

The 1990 Annual PCOM meeting will be hosted by the Hawaii Institute of Geophysics in Kailua-Kona, Hawaii from 28 November to 1 December 1990. The PCOM meeting will be preceded by the Panel Chairmen's meeting on Tuesday, 27 November. A field trip prior to the meeting is possible if there is sufficient interest.

The 1991 Spring PCOM meeting has been changed to the University of Rhode Island from 23-25 April 1991.

The 1991 Summer PCOM meeting will be hosted by the FRG in Hannover from 20-22 August 1991. There will be a two day field trip after the meeting, which will possibly include stops in East Germany.

The 1991 Annual PCOM meeting has been changed and will now be hosted by the University of Texas at the Thompson Conference Center on the Austin

campus from 4-7 December 1991. The PCOM meeting will be preceded by the Panel Chairmen's meeting on Tuesday, 3 December.

The 1992 Spring PCOM meeting will be hosted by either Oregon State University or the JOI Office in Washington. Dates and venue are to be decided at the August PCOM meeting.

852 Conclusion of the Meeting

The Planning Committee thanked Yves Lancelot and Martine Cheminee for their efforts arranging the PCOM Meeting, the Reception, and the field trip. ODP France, the Université Pierre et Marie Curie, and Société Géologique de France were thanked for their hospitality.

The Planning Committee expressed by acclimation its appreciation of the efforts of Lou Garrison on behalf of ODP. Moberly said that we all recognize that Lou has been instrumental in the success of ODP, and wish him well in his retirement.

The 1990 PCOM Spring Meeting adjourned at 4:45 PM.

APPENDICES TO 24-26 APRIL, 1990 PARIS PCOM MINUTES

A FY91 Special Operating Expenses

B Items Related to the Science Operator's Report

C Fifth Annual Co-Chief Scientists' Review Meeting - List of Recommendations

D Items Related to the Wireline Logging Operator's Report

E Development Engineering Schedules

F Operational Plans for Engineering 3B at the EPR

G List of Program Rankings by Thematic Panels

HANDOUTS DISTRIBUTED AT THE PARIS PCOM MEETING

Minutes of the 7-9 March, 1990 Information Handling Panel Meeting

Minutes of the 9-10 April, 1990 Site Survey Panel Meeting

Letter from Earl Davis about the 5-7 April, 1990 EPRDPG Meeting

NSF Report to the PCOM meeting

Engineering Development Status Report

Fifth Annual Co-Chief Scientists' Review Meeting - List of Recommendations

Executive Summary

Shipboard Measurements Panel
Third Meeting
20-21 March 1990
Ocean Drilling Program, Texas A&M University

SMP reviewed all of the shipboard labs and made specific recommendations for geochemistry, paleomagnetics, XRF, and underway geophysics which require some expenditures. A group of physical properties specialists met prior to the full SMP meeting in order to resolve problems associated with the measurement of index properties. The group is drafting recommended procedures for shipboard determination of index properties. This document will be ready for Leg 133. The panel discussed and drafted a recommendation on the use of stable and radioactive isotopes. Representatives from ODP/TAMU presented some new developments. The panel applauded the development of the new computerized barrel sheets. The panel encourages and recommends acceleration of the new digital image scanner. The upcoming Sedimented Ridges Legs were identified as requiring shipboard lab improvements in order to meet the leg objectives. Further definition of these requirements will be completed during the fall SMP meeting.

SMP Recommendations
20-21 March 1990

The panel recommends the core rack and vicinity be de-magnetized on a regular basis, on the order of every 6 months (90-01).

The panel recommends that as a check on shipboard index property determinations, samples for specific gravity determinations be taken at an interval of 1 sample for each lithology for each site and then tested at an experienced shore-based laboratory (90-02).

The panel recommends that a separate, replaceable tank be installed onboard for neutralized HF acid (90-03).

The panel recommends that the task of incorporating more standards into the XRF procedure be performed by a Staff Scientist and shipboard scientists with considerable XRF experience should also be encouraged to do so during forthcoming legs (90-04). In addition, the panel strongly suggests that TAMU/ODP arrange a course with ARL, the manufacturer of the XRF for training of technical staff in the repair of the equipment. These course are normally only available to ARL employees. However, given the remote location of the XRF, ARL may agree to the course.

The panel recommends that ODP/TAMU continue the development of the digital image scanner for routine data capture. Routine data capture should record windows of 10cm length downcore in order to resolve 0.1mm (90-05).

SMP recommends that ODP/TAMU evaluate the technical feasibility of adding total gamma to the MST and report to the next meeting (90-06).

SMP recommends that additional Titanium squeezers (one normal and two small volume) be constructed for the geochemistry laboratory (90-07).

SMP recommends that the PCS Phase II development be completed for Cascadia Margin drilling and that an early evaluation of possible upgrade of the tool for a high temperature environment be completed in preparation for Sedimented Ridges (90-08).

SMP recommends that a shipboard navigation/data logger system be implemented in two stages: (1) immediate purchase of a suitable commercial navigation system to provide the data needed to position the ship on site; and (2) development of a navigation/data logger with multiple inputs, the ability to process (filter, correct, interpolate, spike detect and delete) these data, and provide plots at various scales and projections (90-09).

The panel recommends that PCOM ban any use of radioactive or enriched stable isotopes onboard the JOIDES RESOLUTION (90-10).

SMP restates for the third time the recommendation (89-20) which states: the evaluation of the smear slides should not be broken down into absolute percentages; rather the percent composition should be represented by descriptive terms which represent ranges of percent compositions.

Shipboard Measurements Panel
20-21 March 1990
Minutes

I Introduction of guests and TAMU representatives. The meeting was attended by the following:

Jack Baldauf (ODP/TAMU)
Ron Chaney (guest)
Andy Fisher (ODP/TAMU)
Ian Gibson (member)
Dennis Graham (ODP/TAMU)
John King (member)
Margaret Leinen (PCOM representative)
Kate Moran (chair)
Mike Mottl (member)
John Mutter (guest)
Adrian Richards (member)
Mike Rhodes (member)
Ellen Thomas (member)
Piotr Tucholka (member representative)
Bob Whitmarsh (member)

II Minutes from the second meeting were approved. Changes to the agenda were made. A revised agenda was approved.

III Business arising from the second meeting:

Paleomagnetics (J. King)

At the last meeting, a recommendation was made to purchase temperature dependent susceptibility equipment for the paleomagnetics laboratory. The acquisition of this equipment is underway. The acquisition of an ARM coil was also recommended. TAMU was going to build the coil based on a design used by J. King. However, the original designer is now an independent company. The paleomagnetics staff scientist will pursue the acquisition of the equipment. **Action: TAMU to report on the status of the ARM coil at the next meeting.**

J. King also reported on the status of the core contamination studies he is undertaking. Spikes in magnetic susceptibility occur regularly at the tops of XCB cores, indicating the possibility of core contamination. J. King will analyze samples from the top of the these sections. **Action: J. King to report on the status of the core contamination studies at the next meeting.**

J. Baldauf reported on comments from last week's annual co-chief's meeting. Both a steel beam, located in the vicinity of the magnetometer and the metal core rack are interfering with the measurements in the lab. Shielding of the magnetometer is still a problem. **The panel recommends that the steel beam and the core rack be de-magnetized on a regular basis, on the order of every 6 months (90-01).** The magnetometer shielding cannot be improved. In relative terms, the ship is a "hostile" environment for the cryogenic magnetometer. Consequently, it should be clearly stated in both the Paleomagnetics Handbook and posted in the paleomagnetics laboratory that the instrument is very sensitive; objects should never be placed on the device and personnel should not lean against the device. **Action: TAMU should upgrade the Paleomagnetics handbook and post signs in the**

paleomagnetics laboratory.

Physical Properties (K. Moran)

A meeting of a physical properties subgroup was held on 19 March at ODP/TAMU. The group convened in order to resolve problems associated with discrepancies between independent measurements of saturated bulk density and to review the methods used in the determination of all shipboard index property measurements. The group is preparing a document which defines standard procedures for the shipboard measurement of index properties. A draft document will be prepared prior to Leg 133. A summary of the meeting was presented as follows:

1. Index Properties

There is a discrepancy in test results of bulk density between the methods of 2 minute GRAPE and the 'direct' method for materials of low porosity. The group is preparing a Procedures Document for determinations of index properties for the shipboard physical properties laboratory. The procedures for water content and grain density were agreed upon by the group. The procedures for bulk density require more study, specifically:

(a) Review the results from recent Legs. **Action: Moran and Taylor to review the recent index property test results from Legs 129, 130 and 131.**

(b) Run tests on Leg 129 samples to determine the 'ground truth' specific gravity. **Action: TAMU to sample Leg 129 cores at intervals specified by A. Fisher, seal the samples in water-tight containers and ship to the Atlantic Geoscience Centre Geomechanics laboratory for testing.**

(c) Errors associated with possible pycnometer procedures require calculation and summing to determine total errors and provide limits for reasonable accuracies over the range of porosities normally encountered in the program. **Action: Moran calculate errors for review by the members.**

In addition, the group agreed that the routine determination of grain density using the standard practice should be supplemented by measurement of specific gravity at each lithology and measured at a shore-based laboratory. This supplementary measurement will serve as a check on the routine, less accurate measurement and will be incorporated into Volume A at the discretion of the physical properties specialist. The measurement can also be used with the water content as a check on the saturated bulk density measurement. **The panel recommends that as a check on shipboard index property determinations, samples for specific gravity determinations be taken at an interval of 1 sample for each lithology for each site and then tested at an experienced shore-based laboratory under subcontract to the Program (90-02).** It is estimated that the number of tests required for each leg would vary from 5 to 50. An approximate commercial cost for this test is $40.00, so the cost per leg would range from $200 to $1000.

2. Resistivity

Resistivity equipment onboard the ship requires evaluation. The equipment must be checked to see if it is working properly. After the equipment is checked out, procedures for running tests need to be documented. **Action: Leg 131 participants will make an effort to evaluate the**

resistivity equipment and document resistivity procedures. If they cannot be completed on Leg 131, the equipment should be taken off the ship for evaluation and documentation by an expert in the field. The equipment should not return to the ship until these tasks are completed.

3. Thermal Conductivity

The thermal conductivity equipment and software was recently upgraded. The equipment is very much improved and is well documented.

4. Physical Properties Workshop

Objectives were discussed, a workshop agenda is presently being drafted. The objectives are as follows:

a. Define the present physical property data requirements and accuracies for the program and user community;
b. Review current procedures/methods and identify problem areas;
c. Discuss and identify solutions to the problem areas by looking at immediate and longer term solutions;
d. Prepare an implementation plan for each problem area.

The meeting should be attended by past physical properties specialists and by invited experts in specific fields (e.g. CATSCAN, gamma core logging). The workshop should be held following the joint SMP/DMP meeting in order to incorporate identified needs for logging/sample correlations. The group recommended that the workshop be held during the spring of 1991. **Action: Moran prepare a letter of request to JOI for funding for the workshop.**

Micropalaeontology (E. Thomas/J. Baldauf)

Two recommendations were made at the second meeting with respect to micropalaeontology. The first recommendation (89-29) was to index the taxonomic literature onboard the ship. J. Baldauf reported that this task is very labour intensive. **The panel encourages TAMU/ODP to make every possible effort to begin this task, preferably beginning on Leg 133.**

The second recommendation (89-30) was the implementation of a documented reference slide collection. Since the last SMP meeting, E. Thomas and J. Baldauf have been organizing this effort. The most efficient way to accomplish this task is for micropaleontologists to meet and prepare the reference slides. This can be accomplished with two to three groups of scientists meeting at different times. One group should consist of specialists in high, mid and low latitude benthic foraminifera. This group should meet at the Smithsonian. One or two other groups are required for preparation of slides for diatoms, radiolaria and for calcareous nannofossils. These reference slides are not the same as the reference centers. This collection is required for stratigraphic purposes specific to the ODP representing primary zonation of microfossils. **Action: E. Thomas and J. Baldauf prepare a proposal for submission to JOI/USSAC for funds to complete this task.**

J. Baldauf reported on hydrofluoric acid (HF) safety onboard the ship. ODP has prepared guidelines for the use and storage of HF (Attachment #1). Concern was raised and discussed regarding the use of the tank onboard for disposal of the neutralized HF acid. After long storage periods, the HF can cause degradation of the storage tank and potential failure. **The panel recommends that a separate, replaceable tank be installed onboard for neutralized HF acid (90-03).** The tank should be routinely checked and

replaced as recommended by the manufacturer.

Petrology (M. Rhodes)

1. Standards

At our last meeting, there was a concern that geochemical reference standards were not available onboard. M. Rhodes and J. Baldauf reviewed the available standards onboard and found that there are far more standards available than are routinely used at other XRF laboratories. The problem of standards is not their availability, but their use. It is apparent that standards are not currently in use. Possible reasons for this non-use are:

(a) not all standards have reliable, well accepted preferred values;
(b) preferred values for some standards and some elements are better known than for others;
(c) for certain elements there is poor agreement among laboratories and varying analytical techniques for some standards; and
(d) most technicians do not have sufficient experience to evaluate the reliability and value of these standards.

The panel recommends that the task of incorporating more standards into the XRF procedure be performed by a Staff Scientist and shipboard scientists with considerable XRF experience should also be encouraged to do so during forthcoming legs (90-04). In addition, the panel strongly suggests that TAMU/ODP arrange a course with ARL, the manufacturer of the XRF for training of technical staff in the repair of the equipment. These course are normally only available to ARL employees. However, given the remote location of the XRF, ARL may agree to the course.

2. A Crushing Matter

Recently, there has been considerable pressure from some shipboard scientists to incorporate crushing agate grinding vessels as a routine component of XRF sample preparation. This stems from the concern that samples will be contaminated with critical, petrologically useful, trace elements by the tungsten carbide (WC) vessels that are routinely used. In an attempt to respond to this request, two agate grinding vessels were purchased for use on the Spex Shatterbox. Such an arrangement has used successfully by F. Frey at MIT. This did not work on the ship; both agate vessels rapidly developed cracks. A variety of reasons have been proposed: (1) improper manufacture of the agate grinding vessels; (2) different motor speeds used on the ship versus that used at MIT; (3) samples were not sufficiently reduced in size prior to crushing in the grinding vessels; and (4) insufficient sample was crushed. Of these, M. Rhodes reported that the insufficient sample is the most likely culprit. Apparently, a 10g sample is typically taken for XRF analysis. This amount is too small, even for the more robust WC grinding vessels. Typical sample sizes for these vessels are between 20 and 100 grams. For smaller sample sizes (4-30g), it is recommended that smaller vessels should be used. These are available in WC, but may not be available in agate. These smaller vessels have the added advantage that three samples can be crushed simultaneously. Possible solutions are: (1) replace the Spex Shatterbox with one from Siebteknik, so that both WC and agate grinding vessels are readily interchangeable; and (2) purchase several sizes of grinding vessels (both WC and agate, if possible) so that a variety of sample sizes can be accommodated.

Significant sample contamination through grinding in WC is restricted to W, C, Co, and Ta. None of these elements are determined during shipboard XRF analyses. There has been some concern that Nb contamination may be a problem, particularly as Nb is a critical element, present in low concentrations, in arc-related samples. Tests by M. Rhodes and F. Frey, comparing samples ground in agate and WC, show that grinding in WC introduces at most only 0.5 ppm Nb. This is the detection limit for XRF Nb measurements and therefore hardly significant. Consequently, there is no serious contamination problem for shipboard XRF analyses. It is only a problem when sample powders, prepared onboard are taken away for shore-based analyses. In addition, crushing in agate is much less efficient that in WC, which places a greater demand of time on the XRF technician. Based on these comments, an even simpler solution is to limit shipboard grinding vessels to WC and suggest to shipboard scientists that either additional samples are taken for grinding in their shorebased labs or that they supply their own grinding vessels for specific analytical shorebased requirements.

Computers

1. Standard Plot Templates

At the last SMP meeting, the panel recommended (89-32) that software plot templates be generated for standard plots for each laboratory. Templates are currently available using PICSURE. TAMU/ODP are currently generating templates for the PC/Mac environments onboard. A list of recommended plots were passed on to ODP for micropalaeontology, petrology and physical properties.

2. PC/Mac Software

J. Baldauf reported on the available PC/Mac software onboard the Resolution. The panel reviewed the software and suggested additional software packages which would be useful for data manipulation/display by shipboard scientists. For the MacIntosh computer, additional software includes: Kaleidagraph; Fortran; and C. The PC computer software library should be upgraded to include graphics packages. Harvard Graphics and Sigmaplot would be appropriate choices.

3. Micropaleontological Data Entry

J. Baldauf reported that efforts are currently underway to computerize the paleontological database. Major steps in this direction include modifications to the software package, CHECKLIST. Modifications to this program include the capability of producing "camera-ready" species occurrence tables and the ability to check, verify and enter data into the ODP database. The modified CHECKLIST will be used onshore to generate the paleontological range chart data for the Scientific Results volumes. BUGIT is presently under evaluation by ODP/TAMU as a software package which will be used onboard to directly enter paleontological data into the database and eliminate the current practice of using duplicate, hand-written forms. In addition, the program can be used to provide a data diskette for the shipboard scientist to take back to shore for faster production of post-leg manuscripts. **Action: ODP/TAMU prepare a report on the status of BUGIT for the next meeting.**

4. VMS XRD/XRF Data Transfer

D. Graham reported that the XRD/XRF system, which utilizes a PDP11 is not linked into the shipboard network. Consequently, the transfer of XRD/XRF data to the PC/MAC systems can

only be done using a "jury-rigged" procedure, not easily performed by a shipboard scientist. The cost of networking the PDP11 is too high relative to the age of the computer. The panel suggest that ODP/TAMU pursue improvements to the "jury-rigged" procedure so that shipboard scientists will be able to transfer the data without the assistance of the systems manager.

Sedimentology/Visual Core Description

1. Barrel Sheets

M. VonBreyman and P. Brown presented the new computerized Barrel sheet and visual core description (VCD) prototype to the panel. The prototype is implemented on a Macintosh using hypercard. The system allows the user to directly input barrel sheet and VCD information on the computer screen. The system is very user friendly, flexible and relatively fast. The system will communicate with the shipboard VAX through network protocol transparent to the user. Hard copies can be generated using postscript language. A postscript file can also be generated which can be edited with any text editor or using the ADOBE illustrator software. **The panel congratulates ODP/TAMU on this development. When this software is implemented for shipboard use, the preparation of barrel sheets and the process of VCD will be significantly improved.** Action: SMP to discuss procedures for integration of core and log data on the barrel sheets at the next meeting.

2. Digital Image Scanner

Russ Merrill presented the prototype digital image scanner (DISC). The system has been under development for two related applications. The first application is digital image analysis for single images, such as smear slides. DISC can presently be used for this application. The second application is for routine data capture of all split cores. Both applications were presented to the panel. The system not only replaces the current core photography, but can be used to measure core colour, to analy structure, measure bed thickness, and potentially for the measurement of core texture. The panel agreed that DISC is a very valuable tool and should be further developed for routine shipboard data capture. The major constraint to routine data capture is the amount of data generated. ODP/TAMU should investigate the option of storing the data on videotape in order to minimize cost. **The panel recommends that ODP/TAMU continue the development of the digital image scanner for routine data capture. Routine data capture should record windows of 10cm length downcore in order to resolve 0.1mm (90-05).**

3. Image analysis of smear slides (A. Richards)

A. Richards suggested that instead of using smear slides, other methods should be investigated for compositional analysis. For example, imaging systems for particles falling in a suspension may result in higher data quality. M. Leinen reported that these types of systems are currently used by biological oceanographers. A system is in use at the University of South Florida. Other researchers in the US have developed software for the identification of microfossils. **Action: A. Richards to continue the investigation of alternative methods and report at the next SMP meeting.**

J. Baldauf reported IHP's recommendation that numbers should continue to be used when recording smear slide data into the database. SMP does not agree with this recommendation. The smear slide analysis is qualitative and not quantitative. By storing these data in the database as values

implies a level of accuracy far greater than the current analysis yields. SMP restates for the **third time the recommendation (89-20) which states: the evaluation of the smear slides should not be broken down into absolute percentages; rather the percent composition should be represented by descriptive terms which represent ranges of percent compositions.**

4. Infrared for bulk mineralogy (M. Rhodes)

M. Rhodes investigated the application of this technique and could find no users of infrared for this purpose. **Action: M. Rhodes to contact R. Jarrard/P. Worthington to request additional information and report at the next SMP.**

5. Colour Scanner (K. Moran)

The colour scanner demonstrated at the October meeting is currently onboard the Resolution. The device is onboard to measure colour at discrete core intervals. The data will be analyzed in order to correlate colour cycles with climate cycles. This exercise should provide additional insight into the best method of presenting colour data on the barrel sheets. **Action: K. Moran to present colour data from Legs 130 and 131 at next SMP meeting.**

6. Other whole core analyses (all members)

During the meeting, a number of ideas were presented which relate to whole core analysis. Some of the techniques are specific to compositional measurements, while others are related to stucture and fabric. These ideas represent cases where technological advances 'drive' the science rather than vice versa. Further investigation of these techniques is required for discussion at the joint DMP/SMP meeting. **Action: the following members should investigate and prepare a report on the following for the joint DMP/SMP meeting: J. King - CATSCAN; I. Gibson - X-ray (spectral); M. Rhodes - NMR.**

Downhole logging/correlation

At the October meeting, SMP discussed supplementary core logging measurements as well as downhole measurements for log/core correlations. The most obvious additions were researched for this meeting and discussed.

1. Natural gamma spectrometry (K. Moran)

Harbert Engineering Inc. manufactures two different products which measure total gamma and spectral gamma. The total gamma can be used on the MST. This device costs approximately $14k. **SMP recommends that ODP/TAMU evaluate the technical feasibility of adding total gamma to the MST and report to the next meeting (90-06). The spectral gamma device requires a controlled temperature environment and can take up to 1 hour for each measurement. These restrictions are not compatible with the MST. Any further consideration of the addition of this device to the shipboard laboratory depends upon the priority of this measurement. These priorities will be discussed at the joint SMP/DMP meeting in October.** Action: K. Moran to present spectral gamma options at the joint SMP/DMP.

2. Induced gamma (I. Gibson)

Discussion of this option ended after I. Gibson reported that radioactive samples would result from this method.

3. Downhole magnetometer/magnetic susceptibility (P. Tucholka)

A downhole magnetometer and a susceptibility tool have been developed and used in France. The development was supported by CFP and CEA-LETI in collaboration with CNRS-ENS. Schlumberger is currently working on putting these two tools together with Leg 134 for the target field test. SMP's interests in these logging tools is specifically for core-log correlations. Consequently, the susceptibility tool is of greater interest than the magnetometer to the panel. The vertical resolution of this susceptibility tool is 10 cm and the measurement resolution is 10^{-5}SI. KTB also uses a tool, but the measurement resolution is too low for core-log correlation in sediment. J. King reported that LDGO-BRG are preparing a proposal to develop a high resolution magnetic susceptibility tool. The proposed development is joint with Bartington, the same company which manufactures the shipboard core susceptibility meter. The proposal is for a tool with a vertical resolution of 5 cm and a measurement resolution of 10^{-7} SI. **Action: J. King report on status of this tool development to the joint SMP/DMP meeting.**

Geochemistry (M. Mottl)

A normal capacity Titanium squeezer was loaned to the shipboard geochemistry laboratory by F. Froelich. In addition J. Gieskes has constructed small volume Titanium squeezers which have 20 cm^3 capacity. He will use these on Leg 131. **SMP recommends that an additional Titanium squeezers (one normal and two small volume) be constructed for the geochemistry laboratory (90-07). Although Ti has many advantages over stainless steel (less contamination, harder surface, and lighter weight),** it has a lower thermal mass. This means that during the squeezing process, samples initially cooled to 2°C could detrimentally warm. **Action: ODP/TAMU evaluate the amount of warming using the Ti squeezer compared with the stainless steel squeezers.**

IV PCOM Report (M. Leinen)

M. Leinen presented the current status of the ship's track (Attachment #2). At the previous PCOM meeting, only 6 legs were scheduled. The remaining legs will be scheduled during the next PCOM meeting. It was also recommended that SMP review the upcoming legs for laboratory requirements in order to provide PCOM with any potential constraint issues.

V Pressure Core Barrel Report

Jim Brooks (TAMU) reported on their previous work with the pressure core barrel. The tool was used on four different legs during DSDP and ODP (Legs 76, 84, 96 and 112). The tool was most successful on Leg 76 and had major technical problems on the other legs. The tool was successful in recovering massive hydrates. The samples recovered were kept at 0° while the gases were bled off and analyzed. In general, the same isotopic compositions were measured from the pressurized sample when compared with the normal gas samples. Their research effort in this area has declined with the general decrease in funding from oil companies.

Tom Pettigrew (ODP/TAMU) presented the status of the new pressure core sampler (PCS) and a comparison of this tool with the DSDP pressure core barrel (Attachment #3). The PCS was re-designed to take a shorter pressure core sampler and was made compatible with the APC/XCB bottom hole assembly. The PCS development plan is broken into two phases. The first phase (now complete) is the basic tool

which samples at near in situ pressure. The second phase is the addition of a pressurized transfer chamber for the testing and sampling of the core at near in situ pressure.

The tool was deployed three times on Leg 124. The first deployment recovered a water sample; the second deployment recovered a mudstone sample, but pressure was lost due to a malfunctioning accumulator; and the third deployment was successful in recovering a pressurized sample. Two modifications of the tool were made for Leg 131: an additional port was added for sampling gases and an internal tube was fitted into the pressured sample in order to recover a contamination-free inner sample. The PCS is currently limited to 100-125°C due to the seals.

The most important applications for this tool in upcoming legs are Sedimented Ridges and Cascadia Prism. Sedimented Ridges may have very high temperatures which would presently limit the tool. However, given the high priority for characterization of geochemical fluxes in this environment, the possibility of upgrading the tool for higher temperatures should be evaluated. For the Cascadia Prism, the tool can be deployed in its present configuration. However, the Phase II development of the PCS should be scheduled so that it is available for use on this Leg. The Phase II development should follow the priorities outlined in the October SMP minutes. **SMP recommends that the PCS Phase II development be completed for Cascadia Margin drilling and that an early evaluation of possible upgrade of the tool for a high temperature environment be completed in preparation for Sedimented Ridges (90-08).**

VI Underway Geophysics (J. Mutter)

1. Navigation

The RFP for a navigation system was reviewed by B. Whitmarsh and J. Mutter in light of the bid responses which ranged in cost from $250k to $350k - considerably in excess of the anticipated costs. The specifications outlined in the RFP are not demanding. However, they could not be satisfied by any known off-the-shelf system. In particular, the requirement to produce an on-line plot over an existing track at a variety of map projections could require considerable software development leading to high costs for academic bidders. In addition, the requirement to supply four essentially similar systems also leads to high bids.

Many readily available commercial systems can provide the essential navigation function, include screen plots of real-time position and allow the input of critical site selection data as pseudo way points. These cost less than $50k. **SMP recommends that a shipboard navigation/data logger system be implemented in two stages: (1) immediate purchase of a suitable commercial navigation system to provide the data needed to position the ship on site; and (2) development of a navigation/data logger with multiple inputs, the ability to process (filter, correct, interpolate, spike detect and delete) these data, and provide plots at various scales and projections (90-09).**

2. Real-time and post-processing (D. Graham/ J. Mutter)

Real-time processing consists of AGC only so that the data recorded on tape has a limited amount of filtering. The SIOSEIS package is available for use for post-processing onboard. This processing package replaced the original UTIG package PROCESS. While substantially superior to the original system, it is cumbersome to use and is somewhat limited in capability. The SierraSEIS package available at a discount cost to all IRIS institutions includes "extended" processing options and would be a further improvement over SIOSEIS. However, this upgrade is not essential, but should be considered in future.

3. Seismic reflection data quality (J. Mutter)

The tests using the AMF high speed streamer borrowed from LDGO proved to be very brief and not very informative. At 9.8 knots, the present Teledyne and AMF streamers appeared quite similar, with the AMF streamer somewhat less noisy. Only a few hours of data were obtained at higher speeds; not enough to assess whether the AMF streamer is capable of producing satisfactory records while the RESOLUTION is underway between sites. LDGO will not be using its AMF streamer for a fairly extended period after June '90 and an arrangement could be made to have LDGO loan the streamer to ODP again for an extended period. **Action: Panel review additional data acquired at high speed at the next meeting.**

VII Upcoming Legs

In order to meet the objectives of Sedimented Ridges Legs, some changes to current shipboard procedures are required. The pore water sampling equipment available with the PCS and the WSTP should be upgraded to Ti in addition to the squeezer changes (90-07). Moreover, the sampling of sulphide deposits will require that sulphur be measured and that it be removed prior to any XRF analyses. Sulphur analysis could potentially be achieved by acquisition of a sulphur colorimeter. Methods of removal of sulphur for other element analyses using the XRF require review and further recommendation. **Action: M. Mottl to review methods of sulphide analyses and report to the next meeting. M. Rhodes to review sample preparation of sulphides for XRF and report to the next meeting.**

VII Guidelines for enriched stable and radioactive isotopes

The panel recommends that PCOM ban any use of radioactive or enriched stable isotopes onboard the JOIDES RESOLUTION (90-10). Use of radio- and stable isotopes onboard the JOIDES RESOLUTION should only be considered if absolutely no other possible method can be used to meet the scientific objective. After extensive discussion, the panel could not conceive of any cases where this exception would apply. However, the panel agrees that any requests where the proponent feels this exception applies can be evaluated by the SMP panel chair in concert with TAMU.

It was reported that the ship will be tested for radioactive cleanliness during its upcoming port call in Guam. **Action: J. Baldauf to report on the results of this SWAB at the next meeting.**

IX Report on ODP Sampling/Downhole Tools (ODP/TAMU)

T. Pettigrew reported the status of all of the ODP tools (Attachment #4). Of highest priority to the panel were the new options for hardrock core orientation using the scribe, multishot and the new sonic core monitor; the APC temperature tool which will be ready for Leg 133; and the APC break-away piston. The panel once again discussed sample handling and encouraged TAMU to act on an earlier SMP recommendation for upgrading core liner handling between the drill deck and the catwalk. **Action: J. Baldauf to report on the status of hardrock core orientation, APC temperature tool, the breakaway piston, and plans for core liner handling at the next meeting.**

A. Fisher reported on the status of the GEOPROPS tool. The tool will be ready for field testing this summer and will be tested on an upcoming leg.

K. Moran briefly summarized the lateral stress tool developments (LAST-I and II).

X JOI Geochemistry Workshop

No members of the panel were able to attend the workshop. **Action: M. Mottl and I. Gibson review workshop proceedings and prepare a summary report of relevant panel discussion items for the next meeting.**

XI **SGPP Report**

A SGPP representative was unable to attend.

XII Next Meetings

1. Joint DMP/SMP meeting to be held in Townsville. The proposed schedule is:
   9-10 October.....SMP meeting
   11 October.....Joint SMP/DMP meeting
   12 October.....Ship tour in AM/continue joint meeting in PM
   13 October.....Member shipboard lab visits
   14-15 October....Field trip (Great Barrier Reef)

2. March 5-6 1991 College Station

3. October 22-23 1991 Halifax

XIII The meeting was adjourned at 1500, 21 March. AOB items were held for the next meeting: co-chief review which includes comments on technical support; electronic mail; membership; and x-ray equipment.

United States Department of the Interior
GEOLOGICAL SURVEY
BOX 25046 M.S. 940
DENVER FEDERAL CENTER
DENVER, COLORADO 80225
IN REPLY REFER TO: Office of Energy and Marine Geology
Branch of Petroleum Geology

TAKE PRIDE IN AMERICA

June 19, 1990

90-309

Memorandum

To: Ralph Moberly, Chairman, JOI-PCOM

From: Mahlon Ball, Chairman, JOI-PPSP MMB

Subject: PPSP meeting of 6/11-12/90

This meeting was held at the Holiday Inn in Reykjavik, Iceland.

Attendance:

Yutako Aoki, JOI-PPSP
Mahlon Ball, JOI-PPSP
George Claypool, JOI-PPSP
Claude Delas, JOI-PPSP
Lucio Deluchi, JOI-PPSP
Mimi Fortier, JOI-PPSP
Dietrich Horn, JOI-PPSP
Barry Katz, JOI-PPSP
David MacKenzie, JOI-PPSP
Ralph Moberly, PCOM Chrman., H.I.G.
Lou Garrison, ODP/TAMU
Henk Wories, ODP Safety Panel
Kevin Burke, ODP Safety Panel
Thomas Thompson, ODP Safety Panel
Carl Brenner, JOI Data Bank, LDGO
Steve Lewis, JOI-SSP Liaison
James Hawkins, Co. Chief Sci. Leg 135
Lindsay Parson, Co. Chief Sci. Leg 135
Tom Pyle, JOI, Inc., Wash., DC

Mahlon Ball opened the meeting by requesting self introductions from and circulating a signature list to those at the meeting. Minutes of the previous meeting were approved.

Lou Garrison reviewed drilling results for Leg 131.

Jim Hawkins presented a regional description of Lau Basin geology and scientific objectives for leg 135. This was followed by a site-by-site review of drilling proposed for the Lau Basin, leg 135, led by Lindsay Parsons.

PPSP took the following action regarding proposed sites:

LG 2 Approved with provision that gravity data be presented at August 9-10, 1990, College Station meeting as they pertain to ruling out thick sediment accumulations in this part of the back-arc basin.

LG 3 Disapproved. This site will be reconsidered at the August, College Station meeting with a more complete discussion of industry wells in the vicinity of this site and fuller consideration of USGS seismic data with an eye toward ensuring site location in a structurally low and fault-free site setting.

LG 6 Disapproved. This site will be reconsidered at the August 1990 meeting with fuller attention to USGS seismic data in an attempt to resolve subsurface structure in the fore arc setting.

LG 7 Approved to a penetration of 300 m at time 0754 GMT/134 on Charles Darwin line (Cr 33/88). This site is shallow and off structure.

LG 9 Approved to a penetration of 350 m at time 1820 GMT/130 on Charles Darwin line Cr 33/88. This site is shallow and structurally low.

LG 10 Approved to a penetration of 300 m on 96 m long eastward dipping slope of fault block, with lower, east limit at 20°05.1'S and 176°34.3'W on seismic line Charles Darwin Cr 33/88. This site is shallow and appears to lack positive closure.

Additional sites LG I, 9A, and 10A will be documented with safety check sheets and considered at the August 1990 PPSP meeting.

Steve Lewis presented a preview of 16 proposed sites for Chile Triple Junction drilling. The site layout is designed to establish and contrast three zones: 1) a northern zone where the South American continental plate has not overridden the Pacific spreading center; 2) a central zone where the continental plate is actively colliding with the spreading center; and 3) a southern zone where the continental plate is overriding the spreading center.

From a safety standpoint, the salient features of the Chile Triple Junction are thick sediments, high thermal gradients, structural complexity, and presence of BSRs. The Safety Panel concluded that plans for drilling the Chile Triple Junction should proceed. Specifically, PPSP advised Lewis that sites might be accepted off seismic line intersections where seismic line quality and density were high enough to map structure and demonstrate structurally low settings at total depth for proposed sites. Lewis was also encouraged to check availability of TOC measurements on samples collected in connection with onshore studies in the Chile Triple Junction region.

George Claypool led a discussion of efforts by a subcommittee consisting of himself, Barry Katz, and Keith Kvenvolden to expand guidelines for monitoring hydrocarbon shows and update PPSP policy regarding gas hydrates. A number of steps have been taken to assist shipboard geochemists in improving hydrocarbon monitoring procedures. Claypool has written a program which will enable shipboard chemists to rapidly calculate depths of gas hydrate stability. Katz has written guidelines for shipboard personnel's conduct of Rock-Eval pyrolisis and Kvenvolden has done a similar set of guidelines for shipboard solvent extraction. These guidelines will be conveyed to ODP personnel prior to PPSP's meeting of August 9-10, 1990 in College Station. A number of subjects should be discussed with the ODP hydrocarbon chemistry staff during this meeting

including updated clathrate guidelines, Nankai Trough hydrocarbon shows, the possibility of a short course (1 day) for ODP hydrocarbon chemists, and need for as many temperature measurements as possible.

Regarding Safety Panel policy on clathrates, Ralph Moberly requested input from the safety panel on three proposals that have expressed a desire to drill through the base of the clathrate stability zone. Ball agreed to review these proposals and to poll Claypool and Katz on their safety aspects and pass this information back to Moberly. Garrison emphasized the need for a controlled, deliberate experiment to penetrate the base of the hydrate stability zone in a structurally low position with consideration by the safety panel of questions regarding staffing, equipment, and logging procedures. The safety panel requested that ODP give the panel a status report on down-hole tool developments at its 8/9-10/90 meeting in College Station with particular emphasis on the pressure core barrel as it pertains to clathrate studies.

Mimi Fortier introduced the subject of potential high temperature hazards related to drilling on Juan de Fuca Ridge. Fortier emphasized the necessity of PPSP giving formal assurance to the Canadian Government before the end of September whether this drilling will be reasonably safe. Garrison agreed to circulate a letter from Dr. Robin Riddihough, Chairman of the ODP Canadian Council, expressing potential environmental concerns related to high temperature drilling. PPSP members are encouraged to suggest names of additional high-temperature drilling experts at the upcoming 8/9-10/90 meeting in College Station, Texas. Input from high-temperature drilling experts must be received prior to or during the PPSP meeting of 9/17-18/90 at the Pacific Geoscience Center, Victoria (Sidney), British Columbia. The Juan de Fuca sites will be reviewed by PPSP at this meeting.

Ball led a post-mortem discussion of the Exmouth Plateau drilling leg. From this discussion, it was clear that strong pro and con sentiments continue to exist within the Safety Panel regarding the panel's decision to allow twinning of the Exxon Vinck well which had substantial gas shows at depths below the proposed penetration of the ODP site. Panel members unanimously agreed with Kevin Burke's and Carl Brenner's statements emphasizing that all proposed drill sites are considered on a case-by-case basis and that the decision to allow the twinning of an industry site, with hydrocarbon shows, on the Exmouth Plateau, should in no way be construed as setting a direct precedent to be extrapolated to other drilling proposals.

Ball led a critique discussion of the safety review of the Northeast Australian (NEA) margin. Henk Wories expressed the feeling that this review had been rushed and, despite the fact that the NEA had been previewed prior to review, as pointed out by David MacKenzie, enough other panel members shared this sentiment that it seemed appropriate to try to suggest changes in the review format to correct this situation. Fortier and Claude Delas suggested a summary discussion led by the panel chairman with comments by any and all panel members to emphasize petroleum geologic aspects of each drilling leg following the regional description and outline of general scientific objectives by chief scientists, and prior to their site-by-site descriptions. This procedure will be tested at the next PPSP meeting. Wories re-emphasized his concerns regarding the deep (NEA) drill sites on the axis of the Queensland and Townville Troughs. Garrison and Ball reiterated the fact that warnings concerning these sites had been passed on to the chief scientists and drilling supervisor.

Burke made the point that it was time the Safety Panel refamiliarized itself with ODP logging techniques and devices. At Moberly's suggestion, Ball agreed to invite Roger Anderson, Wireline Logging Services Liaison, to attend an upcoming PPSP meeting to give the Safety Panel an overview of logging procedures and techniques. Lucio Deluchi offered to use AGIP facilities to make petrophysical measurements on core samples to evaluate ODP logging techniques.

Future meeting dates and locations: 8/9-10/90 in College Station, Texas and 9/17-18-90 in Victoria (Sidney), British Columbia were agreed on by panel members.

Malcolm M. Ball

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

University of Washington
Seattle

28-29 June 1990

EXECUTIVE SUMMARY

1. The primary objectives of this DMP meeting were to synthesize experiences from the Nankai leg, to review CEPAC downhole-measurement plans, and to assess the status of the high-temperature logging initiative.

2. In order that the implementation of the logging programme might be properly assessed, DMP requests the Logging Contractor to prepare a written account of each event that leads to a significant departure from the logging programme. This version, and only this version, should be disseminated for consistency. This action is especially necessary where events are set against a backdrop of earlier moves to alter the programme.

3. An ad-hoc working group, comprising representatives from DMP, SMP IHP, LDGO and TAMU, is charged with formulating in workshop session strawman user requirements for the shipboard integration of core and log data. The workshop report is to be set before the October 1990 joint meeting of DMP and SMP with a view to adoption by the two panels. The workshop is scheduled for 29-30 August 1990 in Miami, with Keir Becker as host.

4. The Geoprops Probe, deployed in conjunction with the motor-driven core barrel (MDCB), is needed for the Sedimented Ridges leg (138). The MDCB is scheduled for field trials during Leg 134, but it is unlikely that Geoprops will have completed its land testing by then. If land testing of the Geoprops Probe is satisfactory, the tool should be subjected to sea trials during Leg 135. From this standpoint, Leg 135 would be a better leg for testing the MDCB. Geoprops cannot be deployed until the MDCB is proven.

5. The high-resolution sediment magnetometer, developed by Schlumberger in conjunction with Total and CEA (France), has been satisfactorily tested offshore and is scheduled for deployment during Leg 134. This will provide an ODP test of the tool's capabilities for reversal stratigraphy and for the measurement of susceptibility.

6. A grey paper has been prepared in which messages from Nankai are collated as an aid to the planning of similar future legs, e.g. Cascadia. The disappointing log productivity was a consequence of our inability to drill stable, loggable holes in these difficult environments, as experienced previously during Leg 110. It was not due to downhole-measurement failures.

7. A review should be carried out (by TAMU/TEDCOM) of previous drilling difficulties in Barbados (Leg 110) and Nankai (Leg 131) and solutions be developed to the hole stability problem to permit logging operations in such environments. This review should be undertaken urgently in view of the imminence of Cascadia.

[DMP Recommendation 90/10]

8. Panel reiterates its support for the upgrading of the WSTP tool.

9. Due to a change of policy in Japan, the high-temperature logging tools developed during the 'Eighties by JAPEX (Japan Petroleum Exploration Co.) might now become available to ODP. This development could change the entire scenario for high-temperature logging in ODP.

10. JAPEX should be approached by ODP to establish the availability of (super) high-temperature logging tools and cables. A report on the visit should be provided to the DMP high-temperature subcommittee.

[DMP Recommendation 90/11]

11. The Oahu test hole of Leg 136 should be logged in open hole for sonic, density and BHTV. VSP using the Well Seismic Tool should be discretionary according to the quality of the sonic log. An oblique seismic experiment should be carried out on a re-visit to the site.

[DMP Recommendation 90/12]

12. The instrumented borehole seal should be tested at the Oahu test site during Leg 136. This work is to be assigned a higher priority than VSP at this site.

[DMP Recommendation 90/13]

13. A TECP liaison should be appointed to DMP.

[DMP Recommendation 90/14]

14. A representative of LDGO and/or DMP should be present at DPG meetings to provide input on the nature and scheduling of downhole measurements.

[DMP Recommendation 90/15]

15. Next DMP meeting is scheduled for 12-13 October 1990 in Townsville, Queensland, Australia. A one-day joint meeting with SMP is scheduled for 11 October 1990. These meetings coincide with a port call of the JOIDES Resolution: there will be a ship tour as part of the DMP meeting.

PAUL F WORTHINGTON
12 July 1990

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

University of Washington
Seattle

28-29 June 1990

MINUTES

Present

Chairman:	P F Worthington (UK)
Members:	B Carson (USA)
	J Gieskes (USA)
	M Hutchinson (USA)
	P Lysne (USA)
	R Morin (USA)
	C Sondergeld (USA)
	R Wilkens (USA)
	D M Williams (USA)
	H Crocker (Canada/Australia)
	J P Foucher (France)
	T Nagao (Japan)
	H Villinger (FRG)
Liaisons:	D Cowan (PCOM)
	A Fisher (TAMU)
	X Golovchenko (LDGO)
	J McClain (LITHP)
	J Mienert (SGPP)
Guests:	R Jarrard (LDGO)
	B Malfait (NSF)
	T Pyle (JOI)
Apologies:	D Karig (USA)
	K Moran (SMP)
Absent:	O Stephansson (ESF)

1. Welcome and Introductory Remarks

The meeting was called to order at 8.40am on Thursday 28 June 1990. The Chairman welcomed DMP Members and Liaisons, especially those attending for the first time (Nagao, Williams and McClain), and also the three guests. This DMP meeting was taking place one month later than usual to allow Nankai participants to attend and to report back on that leg. The meeting had two further principal thrusts, a review of CEPAC downhole-measurement plans and an assessment of the status of the high-temperature logging initiative.

Review of Agenda and Revisions

Item 5(vi) to constitute a JOI report from T Pyle: original item 5(vi) to be considered under item 10.

Item 10, CEPAC Planning, to be renamed "Planning" to allow review of WPAC objectives.

Nankai would be discussed under the logging contractor's report (Item 7).

With these modifications the pre-circulated agenda was adopted as a working document for the meeting.

2. Minutes of Previous DMP Meeting, Texas A & M University, College Station, 23 - 24 January 1990

The minutes were adopted with the following modifications:

Page 13, Paragraph 3, Lines 6-7

Delete "... obtain 30m of additional core,"
Substitute "... core for 30 additional hours,"

Page 13, Paragraph 3, Line 12

To read "... but was not discussed by the scientific party."

Page 13, Paragraph 3, Line 14

Insert additional sentence:

"There were two splices in the cable at the time of the decision not to log."

Matters Arising

An issue that needs clarification is the omission of logging at hole 801C, Leg 129. Panel had been advised by the Logging Contractor that the option to log was available. Yet, the Logging Contractor's report to PCOM (PCOM Minutes, April 1990) indicated

that the lower part of 801C could not be "confidently logged", presumably because of the risk of tool loss. This suggests that the option to log (safely) was not available.

DMP Consensus

DMP requests the Logging Contractor to prepare a written account of each event that leads to a significant departure from the logging programme. This version, and only this version, should be disseminated for consistency. This action is especially necessary where events are set against a backdrop of earlier moves to alter the programme.

3. PCOM Report

Cowan reported on the PCOM meeting held in Paris in April 1990. The main purpose of the meeting had been to plan the direction of the drilling vessel during the period 1990-1994. The ship will operate in the Pacific and the North Atlantic during the four-year period beginning April 1990. In particular, an additional minileg has been scheduled to drill and case a hole north of Oahu for emplacement of a digital seismograph.

PCOM is alert to the need to plan for renewal, e.g. by focussing the future programme on a few thematic objectives of global significance. PCOM supported the formation of a working group on deep drilling.

Cowan reported on the PCOM response to DMP Recommendations 89/17 - 89/19 and 90/1 - 90/9, with the qualification that PCOM does not necessarily address each and every panel recommendation as a specific item.

Rec. No.	Description	PCOM Response
89/17-19	High-temperature logging	PCOM is aware of need for high-temperature tools. Funds have been re-allocated to start developments as soon as possible. Contracts for tool development should be bid competitively.
90/1	Re-entry of hole 801C	This is already on the list of LITHP proposals (ranked 10th). Target is FY92.
90/2	Short-term high-temp. logging tools.	PCOM agrees. Matter being handled by BCOM/JOI/LDGO

90/3	Reaming of 4-inch DCS holes	Logging capability will become a big issue if DCS is used widely. TAMU is not prepared to get into reaming until DCS has been further tested (Leg 132). Await more information on DCS capability.
90/4-5	Integration of core and log data	No response
90/6	Use of BGR/FRG borehole magnetometer in 504B	Pre-achieved
90/7	Downhole-measurement programme at 504B before engineering work	Endorsed by LITHP. Accepted by PCOM
90/8	Downhole measurement programme at 504B before casing operations	Agreed, but these measurements do not have to be made on the Engineering Leg.
90/9	LDGO membership of the Conoco-led MWD consortium	Pre-achieved

In thanking Cowan for his presentation, the Chairman commented on the urgency of Recommendations 90/4 and 90/5, which are concerned with developing user requirements for the shipboard integration of core and log data. Until this is done, TAMU computer staff cannot commence work on developing the necessary system. It had been recommended to convene a meeting of DMP/SMP/IHP representatives to develop a strawman strategy for subsequent discussion/adoption by the October 1990 joint meeting of DMP and SMP in Townsville, Queensland. For this to be achievable, the working group would need to meet before the end of August. Unfortunately, PCOM had not endorsed the recommendations.

Pyle commented that DMP Recommendation 90/5 referred to the working group meeting as a "workshop". JOI is responsible for workshops and PCOM probably felt that the issue was not part of their remit. In fact, the intention was for a one-off ad-hoc working group to meet in workshop session in support of an upcoming panel meeting. PCOM Chairman should be approached as a matter of urgency to clarify the situation, after which JOI will be able to handle the necessary arrangements.

[ACTION: WORTHINGTON]

The workshop is scheduled for 29-30 August 1990 at the University of Miami. Keir Becker has agreed to host. Projected attendees from DMP are Worthington, Wilkens, Hutchinson and Karig. Sondergeld is not available on those dates.

4. NSB Briefing

The Chairman reported on the ODP briefing of the US National Science Board (NSB) in Washington DC on 16 March 1990. Downhole measurements featured as one of the highlights of ODP Phase 1, and the Chairman had made a presentation to the Board on "Developments in Logging and Instrumentation". The presentation had been structured in terms of the rationale behind wireline logging, the scope of contemporary measurements, examples of scientific products, benefits to industry, and future projections. The presentation was repeated for the benefit of Panel members.

Malfait commented that the NSB are concerned with new technology, relationships of science to industry, and education and training of new scientists, as well as environmental factors such as global change. The overall presentation, which brought all these issues together, was very well received. In fact, there had been follow-up communication from NSB. There are likely to be further briefings as part of the ODP renewal preparations. The possibility of a road show is being considered. The briefing had been organised by Pyle who complimented the DMP Chairman and the other speakers on its success.

5. Liaison Reports

(i) Lithosphere Panel (LITHP)

McClain reported that many proposals had been evaluated. In general, deep crust/upper mantle targets had been favoured. The DMP initiative on Lithosphere Characterisation could not be ranked highly in its present embryonic form but interest would be strong if this were to be developed further into a drilling proposal. The issue of further drilling at 504B, i.e. whether to deepen the existing hole or spud a new one nearby, did not need to be resolved at present.

LITHP had recommended a working group for volcanic rifted margins. As a consequence of a joint LITHP/TECP meeting, more tectonic aspects are to be accommodated in mid-ocean-ridge drilling. This would have implications for tool developments, e.g. a high-temperature BHTV.

McClain noted that the success of the joint LITHP/DMP meeting at the KTB site in September 1989 points to the desirability of DMP holding joint meetings with other thematic panels (e.g. SGPP, TECP).

(ii) Sedimentary and Geochemical Processes Panel (SGPP)

Mienert reported that the next SGPP meeting is scheduled for November 1990 in Paris. It would be useful to have a DMP member present. Since Villinger and Karig would be attending the fluid-flow workshop in Paris on the previous day, they are the obvious DMP nominees. They could decide later which one would attend SGPP.

[ACTION: KARIG/VILLINGER]

(iii) Technology and Engineering Development Committee (TEDCOM)

The Chairman reported on the meeting of TEDCOM held in Salt Lake City on 14-15 February 1990. The primary purpose had been to review progress on the Diamond Coring System (DCS) and to visit the test rig facility. (Annexure I)

(iv) Shipboard Measurements Panel (SMP)

There had been no DMP liaison at the March 1990 meeting of SMP and SMP Chairman, Kate Moran, had been unable to attend the present DMP meeting. Therefore no report could be tabled. The Chairman undertook to contact Moran to clarify issues pertaining to the proposed August working group meeting on the shipboard integration of core and log data.

[ACTION: WORTHINGTON]

(v) KTB

Villinger reported that the pilot-hole rig had now been removed and the new rig for drilling the deep hole was due to be activated on 8 September 1990. An international conference on scientific drilling and logging is scheduled for 10-11 September 1990 in Regensburg, FRG. The aim is to bring together programmes for continental scientific drilling. Pyle is to make a presentation on the logistics of developing a collaborative programme. In the present climate, this meeting is likely to attract more attendees from Eastern Europe.

(vi) JOI

Pyle reported that the ODP Long Range Plan had been issued together with a brochure describing the scope and aims of ODP. Other activities of interest to DMP include keeping track of the development and expenditure associated with the DCS, progressing the issue of high-temperature (slimhole) logging, and establishing links with other geoscience programmes.

EXCOM have approved the draft budget plan for FY91 and NSF approval is now awaited. This makes provision for, inter alia, ODP participation in the Conoco-led MWD consortium, development of high-temperature slimhole tools (temperature log, water sampler),

dewaring of donated equipment for high-temperature deployment (resistivity log), and provision of a person for shipboard FMS processing.

6. Tool Monitor Reports

(i) Geoprops Probe

The tool is almost ready for land testing. Karig has funds to run land tests at the ODP site. Contact should be made with Tom Pettigrew (TAMU) to ascertain the precise nature of the tests.

[ACTION: FISHER]

The Geoprops Probe will be needed for the Sedimented Ridges leg (138) and for Cascadia (not yet scheduled). The tool is run in conjunction with the Navidrill, now re-named "Motor-Driven Core Barrel (MDCB)", which is itself scheduled for sea trials during the Vanuatu leg (134) with a view to being operational by Leg 137. This suggests that Geoprops should also be tested at sea during Leg 134 but such a schedule would probably not allow sufficient time for land testing.

DMP Consensus

If land testing of the Geoprops Probe is satisfactory, the tool should be subjected to sea trials during Leg 135. From this standpoint, Leg 135 would be a better leg for testing the MDCB.

The Chairman noted that Geoprops cannot be deployed until the MDCB is proven. However, when this has been done, a non-functioning Geoprops would be a visible impediment to successful data gathering during Leg 138. It is therefore important that the testing of Geoprops progresses as quickly as possible.

(ii) LAST

Moran tabled the following written report in absentia.

LAST-I

The Lateral Stress Tool (I) was deployed in the final two holes of Site 808. The tool successfully completed measurement of in situ lateral stress and pore fluid pressure in three out of six deployments. Software operational errors and one deployment where the piston corer did not fire were the reasons for failure of the tool to make measurements in the other deployments. Initial interpretation of the data suggests excess fluid pressure and lateral stress equivalent to a horizontal/vertical stress ratio of 1.2.

Given the severe pipe conditions (excessive vibration) and its first time operational use, the tool performed remarkably well. The only damage was the loss of one (of three) stress sensors on one of the two tools during the second deployment. Needless to say, the operator was very pleased.

LAST-II

LAST-II was successfully tested onshore in February at Fugro-McClelland in Houston. No major modifications are required. It is scheduled for offshore tests this summer in the Gulf of Mexico at relatively deep water sites (1000ft). The tests will be run using a diamond coring system.

(iii) BGR Borehole Magnetometer

Villinger reported that the tool is under construction but has not yet been tested. The tool will be rated to 200°C. Bosum is the principal investigator. DMP has previously recommended that this tool be run in hole 504B after deepening. Villinger will establish when the tool is likely to be ready for shipboard deployment.

[ACTION: VILLINGER]

Nagao commented that a new Japanese magnetometer is being rebuilt from an earlier tool as part of the Japanese national plan for downhole measurements. The diameter is 63mm. Kinoshita is the principal investigator. This might also be available for Leg 139.

(iv) Wireline Packer

The tool was land-tested at LDGO but the packers would not deflate. The problem was the dump housing. A new one was developed and sent to the ship for use in Nankai. However, the tool was not deployed because of hole conditions. There are two tools: one is at LDGO, the other on board ship. The next scheduled deployment is in reef carbonates during Leg 133.

(v) Sediment Magnetometer

Foucher reported that the (Schlumberger-Total-CEA) high-resolution downhole magnetometer, which was land-tested prior to September 1989, has now been satisfactorily tested offshore in Indonesia. Diurnal variations are recorded using another magnetometer located in a rubber boat that is remote from the ship. The two constituent downhole tools, for measuring magnetic field and susceptibility, are on schedule for deployment in Vanuatu (Leg 134). This will provide an ODP test of reversal stratigraphy and susceptibility. If successful, DMP will need to decide whether the tool should become a routine tool. An important factor is that the tool uses proprietary software for post-cruise analysis: therefore, magnetic logs in sediments would not be available in real time on board ship. The costs associated with an additional routine tool might impact on the funds available for high-temperature logging tools.

(vi) Flowmeter Permeability

Morin reported on a proposal submitted to NSF to develop a flowmeter tool for use with the drillstring packer. The proposal is for the purchase of a tool comprising spinner (velocity),

pressure and caliper measuring components. The tool would require a new go-devil design to be developed with the help of TAMU engineers. The aim is to deploy the tool at 504B and/or on the Sedimented Ridges leg (138).

7. Logging Contractor's Report

Golovchenko reported some scientific highlights from the logging data acquired during Legs 129-130.

Leg 129: Old Pacific Crust

Hole 801B penetrated some of the oldest oceanic crust and pelagic sediments that have been drilled. The filtered gamma ray log has revealed 100 and 410 ka Milankovitch periodicities in the Jurassic.

Leg 130: Ontong Java Plateau

Several failures of the GST occurred with no back-up tool available. There is good correlation of resistivity logs between holes 807A and 807C, and of velocity vs depth profiles between holes 806B and DSDP 586.

Leg 131: Nankai

No logging highlights. The FMS was not run and no logs were obtained in the decollement. Poor hole conditions and strong currents made logging very hazardous. The currents caused toolstrings to start unscrewing. There were serious hole stability problems. One toolstring was lost in hole 808B when the tool was lowered using the SES to a position below the drillpipe near the bottom of the hole: for some reason the pipe was lowered again and the tool was crushed.

The panel debated messages from Nankai at some length. The first point of concern was that the disappointing log productivity would be seen as a downhole measurements failure whereas it was due to the difficulties of drilling stable, loggable hole. The second was that Nankai had been affected by the same problems as Leg 110: it was therefore reasonable to suppose that without remedial action these same problems would return to inhibit future legs targeted at similar areas, e.g. Cascadia. The key issue is one of improved hole stabilisation. If no improvement in hole stability is achievable, perhaps these environments should not be drilled. A sealed circulation system would be an obvious benefit. Even if some improvement in hole stability is obtained, it might still be advisable to change drastically the logging strategy. Should we, for example, consider measurement-while-drilling (MWD) as an alternative to wireline logs in these environments?

The Panel identified three general requirements. First, it was imperative that the lessons of Nankai (and of Leg 110) be acted upon to prevent a recurrence.

DMP Recommendation 90/10

"A review should be carried out (by TAMU/TEDCOM) of previous drilling difficulties in Barbados (Leg 110) and Nankai (Leg 131) and solutions be developed to the hole stability problem to permit logging operations in such environments. This review should be undertaken urgently in view of the imminence of Cascadia."

The second identified requirement was to keep in close touch with the Cascadia DPG on which DMP is represented (Carson). A report on the August 1990 meeting of the Cascadia DPG should be an agenda item for the next DMP meeting in October.

[ACTION: CARSON, WORTHINGTON]

The third requirement was to synthesize messages from DMP participants in the Nankai Leg (Fisher, Foucher, Gieskes, Karig, Yamano). The Chairman asked these persons to provide him with a summary of their key messages so that these could be emphasized for the future benefit of the programme.

[ACTION: FISHER, FOUCHER, GIESKES, KARIG, YAMANO]

In a letter to the Chairman, Karig proposed that these messages be incorporated into a grey paper to stimulate improvements in drilling, logging techniques and downhole tool design. The Chairman undertook to synthesize these messages. (See Annexure II)

[ACTION: WORTHINGTON]

Leg 131: WSTP Performance

Karig specifically identified the need for improvements to the WSTP tool. During deployment at Nankai the tool flooded twice due to the dislodgement of a plug by vibration. Attempts to collect pore pressure data using the WSTP in conjunction with a recording package were successful only one out of four times.

Fisher reported that TAMU are working on improvements to the WSTP. These include:

- high-temperature (200°C) upgrade for the Sedimented Ridges leg;
- upgrade the electronics (125°C);
- incorporation of a separate, intelligent recording package;
- strengthening the tool.

DMP Consensus

Panel reiterates its support for the upgrading of the WSTP tool.

Legs 131 & 132: ONDO Experiment

Nagao reported on the ONDO (ODP Nankai Downhole Observatory) experiment. In introducing his report, Nagao related that the Japanese community very much appreciated the scientific opportunities afforded by recent ODP legs.

The ONDO is a long-term temperature monitoring system developed specially for ODP drill holes. The main objective of this experiment is to detect possible temporal variations in fluid flows in the Nankai accretionary prism. The ONDO system originally had an 800 m long temperature cable with 19 thermistor sensors at intervals of 40 m and one pressure gauge at each end. Temperature and pressure are recorded once a day and the data can be retrieved by a surface ship through acoustic telemetry signals. The system must be lowered through the drill pipe with the logging cable and hung on the topmost part of the casing with landing pads.

The ONDO system was deployed in Hole 808E drilled during Leg 131 at the toe of the Nankai prism. The hole is 1200 m deep and cased down to about 520 mbsf. Since it was proved that the hole condition is too unstable to deploy the 800 m long cable, the bottom 280 m of the cable carrying six temperature sensors was cut off before attempting deployment.

On Leg 131, deployment of the system was attempted several times but not accomplished. In the early stages, many of the physical connections of the system became loose due to strong vibration of the drill pipe excited by the Kuroshio current, resulting in various mechanical and electrical damages in the system. The electronics were repaired, and the mechanical strength of the system was enhanced as far as possible on board. Thereafter the tool did not suffer any significant damage, but it could not be run through the pipe. A core barrel with a sinker bar was run through the pipe twice to clear any obstructions, and the landing pads were replaced by weaker ones to reduce the friction while running through the pipe. Despite these efforts, the tool sat down inside the bottom-hole assembly every time.

The cause of the failure was probably that the thermistor cable was stretched by its own weight and that of the sinker much more than expected and that it landed on a bridge below the casing shoe. The large friction between the landing pads and the bottom-hole assembly may also have contributed. Thus, after the operations on Leg 131, the thermistor cable was shortened by 80 m, and the strength of the landing pads was further reduced. The final number of temperature sensors is 11.

On Leg 132, the ONDO system was successfully deployed in Hole 808E on 11 June. The tool passed through the pipe, landed on the landing sub, and was released with the electric release system. After pulling up the drill pipe, a test of acoustic telemetry was conducted with all the thrusters of the ship shut down, but no data were obtained probably because of the high level of ship's noise.

First data retrieval will be attempted at the end of July 1990 and the results will be reported at the next DMP meeting.

[ACTION: NAGAO/YAMANO]

Budget Status

Golovchenko reviewed the FY91 budget highlights that relate to downhole measurements. Featured items were:

High-temperature logging tools; double-dewaring of the ARCO resistivity tool and development of thermal protection for sonic and gamma-ray tools.	$180 000
Computer equipment	$ 30 000
DMT (WBK) digital televiewers (N.B. existing BHTVs to be retained as back-up)	$ 82 600
Additional personnel (i) to handle increased requests for logging data, (ii) data processer (iii) part-time computer programmer, (iv) half-time TAMU technician for FMS processing.	$ 60 000
Conoco consortium (MWD and wireline tools)	$ 30 000

Schlumberger
- 4.5% increase in the daily charge
- purchase of wireline cable
  (N.B. the Schlumberger MAXIS 500 recording system is to be acquired for ODP use)

8. Workshop on Log Data Quality

The ODP workshop on log data quality was held in Washington DC on 13-14 April 1989. Fisher and Golovchenko reported on progress made towards fulfilling each of those recommendations which relate to TAMU and LDGO.

Recommendation (2)

Logging programmes should be identified after the thematic objectives have been formulated but before the provisional leg structure is established. Thereafter, logging should comprise an integral part of the planning process.

Progress

During the Indian Ocean programme, logging plans were incorporated very late because the programme itself changed at the last minute due to late site-survey results or permit requirements. Beginning

with WPAC, the logging plans were formulated at a very early stage in the programme and were an integral part of the programme from that point. With Central and Eastern Pacific, the logging plans are still being integrated into the programme at the early planning stage, but only two years ahead of cruise dates as opposed to three years for WPAC.

Recommendation (4)

The JOIDES logging scientist should be identified and trained at the earliest possible stage in the pre-cruise planning process. All prospective JOIDES logging scientists should attend LDGO for at least one week. Training is essential in view of the technical complexity of the downhole measurements programme.

Progress

JOIDES logging scientists are identified as early as is possible, at the same time that the rest of the scientific party for a particular leg is chosen. The job is completed by the ODP Manager of Science Operations with the assistance and advice of the Borehole Group Chief Scientist, Co-chiefs and the TAMU Staff Scientist. There has been some difficulty in finding JOIDES logging scientists in the past, but increased education of the community, largely through Logging Schools offered at major meetings, has helped to increase interest in the position. Once a scientist accepts the position of JOIDES logging scientist, it is up to that scientist to make arrangements to attend a training session at the LDGO BRG facility.

Recommendation (5)

DMP in consultation with LDGO should formulate a more specific job description for the JOIDES logging scientist.

Progress

A specific job description for the JOIDES logging scientist was written at the Sept. 1989 meeting of the DMP. This job description will be used to advertise the position in the JOIDES Journal and will be sent to prospective logging scientists.

Recommendation (6)

Because of the remoteness of the shipboard location, LDGO should particularly ensure that at least one logging scientist is completely capable of operating and maintaining the shipboard systems. These should be simplified so that the JOIDES logging scientist can fully participate in the routine log processing and analysis.

Progress

Every effort is made to train thoroughly the Lamont logging scientist in Masscomp maintenance and minor repairs during his or her pre-cruise training. However, more complex problems with the system require the aid of TAMU personnel familiar with Masscomp hardware. Occasionally, they, too, cannot resolve the problem (usually because of the lack of parts), and the equipment must be sent back to Lamont for repair. The JOIDES logging scientist receives pre-cruise training at Lamont on the use of Terralog, the log analysis program used on the ship. Prior to the first logging operation, the JOIDES logging scientist is encouraged to spend time practising data analysis using existing data sets to that he or she is fully proficient when the first logs of the leg become available.

Recommendation (7)

The LDGO or the JOIDES logging scientist should make a presentation to the shipboard party early in a cruise to outline the scientific purpose of the logging programme.

Progress

The Lamont logging scientist, often in conjunction with the JOIDES logging scientist, presents an overview of the logging programme and the type of interpretation possible from each log. This has been done routinely on every leg since Leg 120.

Recommendation (8)

Adequate time for hole conditioning should be included in all leg schedules.

Progress

Time estimates for logging routinely provide time for one or more "wiper trips". It is difficult to estimate the actual time necessary for conditioning a particular hole until after drilling is complete and conditions are known.

Recommendation (9)

Development of the new side-entry-sub (SES) is essential in view of its safety, operational and time-saving benefits, relative to the existing facility.

Progress

Development of the new SES is completed and it has been delivered to TAMU.

Recommendation (10)

The side-entry-sub should be run in all cases except where hole conditions appear to be superior.

Progress

It would actually be a major mistake to deploy the SES in all cases of poor hole conditions. The SES is best used in cases where there are small bridges which can be punched through relatively easily. In instances where large sections of the hole are swelling and grabbing the drillpipe, the SES has been a hindrance because it has prevented quick removal of logging tools from the string so that the string can be rotated. In addition, deployment of the present SES prevents use of the Kinley crimper and cutter and may thus result in the loss of logging tools. The decision to use or not the SES is left to the Operations Superintendent, Co-chiefs and logging scientists (JOIDES and LDGO) in consultation.

Recommendation (11)

Time provision should be made at the earliest possible stage of planning either to deploy the side-entry-sub without detriment to the scientific logging schedule or to drill a separate hole dedicated to logging at that site.

Progress

The initial stages of time planning typically take place at the pre-cruise meeting, with the Co-chiefs, LDGO representative and Staff Scientist in attendance. The time dedicated to conducting downhole measurements should be based on the scientific priorities of the cruise. It is the job of the LDGO representative to inform those present at the meeting of the options available and the time required for each. As demonstrated on Leg 131, drilling a dedicated hole provides no more of a guarantee of logging success than does use of the SES.

Recommendation (12)

The wireline heave compensator (WHC) must be fully maintained by the time-shared SEDCO mechanic. Routine standard testing of the WHC should be undertaken at least six-monthly. Analysis of accelerometer data from the formation microscanner (FMS) would serve in lieu of routine testing.

Progress

The WHC is now maintained by a time-shared SEDCO mechanic.

Recommendation (13)

LDGO should be formally assigned a half-time technician for shipboard electronics support.

Progress

There is a fixed number of berths available on the Resolution for scientific and technical staff. It is up to the Co-chiefs and the Manager of Science Operations to determine how those berths are to be divided. The inclusion of an additional logging technician requires the elimination of either another technician or another scientist. This recommendation can be partly accommodated by occasionally sailing an LDGO electronics technician.

Recommendation (14)

The degradation of the data from the neutron porosity and sonic tools, caused by the new standard tool combinations, is unacceptable in view of the emphasis on data quality. Where high quality neutron porosity and sonic data are deemed essential, provision should be made for running separately an eccentered tool combination and a centred tool combination taken from the seismic stratigraphy/porosity string. This will require an additional logging run.

Progress

Where high quality neutron porosity and sonic data are considered a priority, separate eccentered and centered tool combinations are run. However, time constraints often preclude an additional logging run and, in these cases, the data must be reprocessed to obtain satisfactory sonic and neutron porosity logs.

Recommendation (15)

A composite plot of total natural gamma, induction resistivity, lithodensity and sonic logs should be prepared and distributed as soon as possible after completion of the first logging run, subject to appropriate quality control criteria. This would ultimately require data transfer from the CSU to another shipboard system. A system should be developed to read raw Cyber Service Unit (CSU) field tapes directly into a processing system to facilitate the rapid presentation of primary field data.

Progress

Standardization of logging and core data displays is now being considered by DMP, SMP and IHP. Schlumberger has installed a new, faster CSU system. Currently, a copy of the logs is available at the end of each logging run. During the summer of 1991, an interactive data acquisition/processing system will be installed on the ship by Schlumberger. This system will help in getting the processed logs out to the shipboard party while logging operations are still underway.

Recommendation (16)

The shipboard whole core scanning facility should be extended to include natural gamma spectroscopy and, if possible, induction resistivity, for correlation with and calibration of borehole logs.

Progress

The SMP is now considering which additions to the whole-core multisensor track (MST) are most desirable and how these might be incorporated. The SMP is also considering the addition of a split-core system. It is not clear if a natural gamma system is compatible with the MST or if it will require a separate machine/room.

Recommendation (17)

The TAMU computer users group are urged to give high priority to the implementation of a system to merge well-log and core-barrel data on board ship.

Progress

The computerization of barrel sheets is now under development, along with real-time merging of MST data. Merging these datasets with logs will require additional time. The biggest problem is correlating logs with cores in cases of low core recovery.

Recommendation (18)

A software user-directory should be compiled of all shipboard systems, to include personal and mainframe computers. A synthesis of this should be distributed to the scientific party prior to each leg.

Progress

A directory of available software is now made available at the start of each cruise.

Recommendation (20)

An archive of tool response characteristics should be established at LDGO. LDGO should approach the logging subcontractor who should be asked to provide sufficient information to enable log response to be properly simulated.

Progress

The LDGO BRG has approached Schlumberger to provide tool response characteristics. LDGO has been promised their full cooperation in obtaining this information on an as-needed basis. The LDGO BRG,

using the information provided in the raw field tapes, could determine some of the characteristics, but time constraints and a personnel shortage prevent this endeavour from being undertaken.

The Chairman thanked Fisher and Golovchenko for their comprehensive report. Ongoing items would be revisited at a future date.

9. High-Temperature Technology

(i) High-temperature logging technology in member countries

United Kingdom

The Chairman reported that the Hot Dry Rock Project at the Camborne School of Mines anticipated temperatures of around 200°C. The logging tools being deployed do not therefore approach the 350°C ratings that are being sought in ODP. There are no other high-temperature initiatives in the UK although the BRIDGE programme might have a logging requirement at some future date.

France

Foucher reported that the high-temperature thermal probe, an adaption of that which has previously been used in 504B, is rated to 500°C. A proposal is being submitted (to JOI) to supply the probe to ODP.

FRG

Villinger had nothing to add to the review provided by Kessels (KTB) at the last DMP meeting.

Japan

Nagao reported that high-temperature logging tools are mainly developed by JAPEX (Japan Petroleum Exploration Co.) which is 50% owned by the government. In the past, JAPEX tools have not been available to ODP. However, there has recently been a change of policy and JAPEX tools may now be made available for upcoming ODP legs.

A super-high-temperature geothermal well logging system was developed in 1985. This system, which is rated to 450°C, includes temperature, pressure and spinner tools as well as sonic, laterolog and borehole fluid sampler. All tools are slimhole. They are not combination tools and must therefore be run separately.

Recently JAPEX has been engaged upon developing the following combination tools.

1. PTS (Pressure, Temperature, and Spinner) combination tool.

Maximum operating temperature	300°C
Maximum operating pressure	700kg/cm^2
Outer diameter of sonde	62mm
Overall Length	2950mm
Weight	40.0kg
Wire line	7 conductors
Standard logging speed	20m/min
Maximum operating time	8 hours at 300°C
Recording	Digital

JAPEX has three sets of PTS tools. They believe that there would be no problem in using them in ODP in FY92. If the appropriate (300°C) on-board Schlumberger cable is available, they can be used at very low cost.

It is believed that a U.S. company (SDI) also has a 300°C PTS tool.

2. PTF (Pressure, Temperature, and Flow rate) combination tool.

Maximum operating temperature	375°C
Maximum operating pressure	350kg/cm^2
Outer diameter of sonde	43mm and 56mm
Overall Length	4000mm
Wire line	1 conductor
Maximum operating time (40mm)	4 hours at 375°C
Maximum operating time (56mm)	8 hours at 375°C
Recording	Digital

JAPEX is now developing this 375°C PTF tool. They also believe that there would be no problem in using it in ODP in FY92. A rental charge for this tool is about US$ 4000 per month including a retrieving (on-board) unit and two sondes.

3. Geophone tools

Maximum operating temperature	260°C
Maximum operating pressure	350kg/cm^2
Outer diameter of sonde	100mm
Maximum operating time	8 hours at 260°C

JAPEX is currently developing an unlimited-operating-time type geophone tool: it can be available in FY91.

4. Open Hole Logging Tool

The following tools are available as of today. The maximum operating temperature is 260°C.

Dual laterolog
Borehole compensated (BHC) sonic log
Gamma-ray spectral log
Formation density compensated (FDC) log
Neutron log (NL)

5. Borehole Televiewer (BHTV)

Maximum operating temperature	230°C, unlimited
Recording	analog

6. Packer

JAPEX is developing an open hole packer system which can be used up to 260°C.

7. Cable

The following cables are available.

Temperature up to 300°C	Teflon cable
Temperature up to 500°C	Mineral-insulated cable

The Chairman welcomed Nagao's report. The revelation that JAPEX tools/cables might become available to ODP was an exciting one, and it could change the entire scenario for high-temperature logging in ODP. The Chairman thanked Nagao for conveying such a promising message.

(ii) <u>High-temperature logging technology in the USA</u>

Lysne identified three areas of activity, national laboratories, logging service companies and combined scientific programmes.

Prior to 1983, Los Alamos built high-temperature tools for their Hot Dry Rock Project, and Sandia evaluated the components. These tools were rated to 300°C but were of large diameter.

Post 1983, the Continental Scientific Drilling Program (CSDP) has pursued diamond core drilling with core recovery in excess of 95%. Temperature and fluid sampling tools that are compatible with this system have been deployed. There have also been interactions with the geothermal industry, e.g. for the development of a high-temperature BHTV.

In 1990. as a demonstration to ODP, the VC-2B exercise was carried out. This involved the deployment of active and memory temperature tools (Sandia), and the Los Alamos and Lawrence Berkeley fluid samplers. There have subsequently been moves towards a TAMU/Sandia corporate research agreement for the development of high-temperature tools.

Future Sandia activity is intended to encompass the development of multi-megabyte memory systems, MWD memory tools, collaborative geothermal logging, and interactions with ODP. Sandia's existing CSDP technology is available to ODP, e.g. through the loan of a temperature tool. New CSDP tools and technology would require a formal agreement before transfer.

In terms of logging companies, Lysne is working with Eddie Howell (UNOCAL) to test the HLS hostile environment logging (HEL) system in UNOCAL wells. Tool diameters are 2.75 inches.

(iii) Future Strategy

ODP priorities are for downhole measurements of temperature, pressure, formation resistivity and fluid resistivity, the latter by means of a water sampler. The deadline for this technology to become available is June 1991 for the Sedimented Ridges leg (138). This leg will use conventional drilling, so cooling by circulation might be feasible.

Options are:

(a) JAPEX suite
(b) HEL tools
(c) Sandia temperature tool & slimhole water sampler
(d) double-dewared ARCO tools (resistivity)

Options (b) - (d) are being pursued, although activity on option (c) has been slowed by the need to trawl the ODP community. A subcommittee comprising Worthington, Lysne and Sondergeld was charged with monitoring progress. Option (a) needs action, and Panel formulated the following recommendation.

DMP Recommendation 90/11

"JAPEX should be approached by ODP to establish the availability of (super) high-temperature logging tools and cables. A report on the visit should be provided to the DMP high-temperature subcommittee."

Pyle informed the Panel that he was scheduled to visit Japan in mid-July 1990. He would undertake to investigate how ODP might pursue the Japanese offer of tools/cable.

He would report back to the DMP subcommitte and also to TAMU via Fisher.

[ACTION: PYLE]

The Chairman offered to provide Pyle with appropriate technical briefing papers prior to his departure.

[ACTION: WORTHINGTON]

10. Planning

Fisher provided a summary of the scheduling and scientific/engineering objectives for Legs 132 - 139 (Annexure III). Jarrard reviewed the logging programmes, most of which are essentially as previously recommended by DMP. Specific points of interest are emphasized.

Leg 132: Engineering

The second engineering leg has as its primary objective the testing of the DCS, which is expected to be deployed selectively on Legs 139 et seq.

Leg 133: NE Australia

The new (strengthened) SES will be available. The wireline packer is to be used to sample fluids in reef carbonates.

Leg 134: Vanuatu

The German digital televiewer is to be deployed. This leg sees the first use in ODP of the Schlumberger et al. sediment magnetometer. Shipboard FMS processing should be available for the first time.

Leg 135: Lau Basin

No pre-cruise meeting has been held because two sites were rejected on safety grounds. Standard logs are scheduled for all loggable sites. In addition, FMS, wireline packer, BHTV and magnetic susceptibility are scheduled at all these sites except LG3. The University of Washington magnetometer is not functional: if available, the German (BGR) magnetometer would be ideal for this leg. Villinger will approach Bosum to ask if this magnetometer can be deployed during Leg 135 instead of at 504B.

[ACTION: VILLINGER]

Leg 136a: Seismometer Test Hole, Oahu

Panel reviewed the logs that should be run in this hole. These are:

BHTV	(to see how and to what the seismometers are clamped)
Sonic/Density	(for seismic characterisation)
VSP	(if sonic log poor)

Oblique Seismic Experiment (OSE) using another ship on a re-visit.

DMP Recommendation 90/12

"The Oahu test hole of Leg 136 should be logged in open hole for sonic, density and BHTV. VSP using the Well Seismic Tool should be discretionary according to the quality of the sonic log. An oblique seismic experiment should be carried out on a re-visit to the site."

An instrumented borehole seal is being developed for deployment during the Sedimented Ridges leg (138). Keir Becker has pointed out by letter that the Oahu test hole provides an ideal, and possibly the only, window for testing. This would require modifications to the re-entry cone for the test hole. The sealing mechanism could then be tested during a 12-day period on site. Panel understood that there would be very little risk to the hole.

DMP Recommendation 90/13

"The instrumented borehole seal should be tested at the Oahu test site during Leg 136. This work is to be assigned a higher priority than VSP at this site."

Leg 136b: 504B

The initial downhole measurements at 504B comprise temperature logging and fluid sampling (using Sandia or equivalent technology). It is proposed to measure permeability by deploying a flowmeter with the drillstring packer.

Leg 137: Eastern Equatorial Pacific

The original DMP proposals included provision for stress measurements. These are not part of the final schedule. The leg would benefit enormously from downhole reversal magnetometry but there are doubts that the sedimentation rate and/or magnetisation would be sufficiently high.

Leg 138: Sedimented Ridges I

This has evolved into two legs. Leg I is to be drilled with full-size holes: Leg II will use the DCS. Hole cooling may be an option for Leg 138 provided that there is no active upwelling. Leg 138 is the highest priority for high-temperature fluid-sampling and downhole measurement of temperature.

In terms of the earlier DMP logging recommendations, no induced polarisation tool has been identified and no proponent for VSP has come forward. Flowmeter permeability would be useful here. Hole sealing is planned. A high-temperature cable will be needed, probably teflon with a 300°C rating. This cable rating suggests that some form of hole cooling will be essential if the temperature estimates of 350°C turn out to be correct. However, hole cooling can introduce hole stability problems.

The Leg 138 pre-cruise meeting would benefit from the presence of a high-temperature logging specialist in addition to the LDGO logging scientist. Chairman will write to Co-chiefs Earl Davis and Mike Mottl with the proposal that Lysne attends.

[ACTION: WORTHINGTON]

Legs 139 et seq.

Logging programmes will be discussed at the next DMP meeting. In particular, there is a need to learn from Nankai to prevent a recurrence at Cascadia. It was noted that the detailed fluid sampling proposed for Cascadia is likely to be prohibitive in terms of time.

11. COSOD I Objectives

No report available on the extent to which downhole measurements have helped COSOD I objectives to be met. Deferred to next meeting.

[ACTION: LDGO LIAISON]

12. Lithosphere Characterisation

This is to be progressed as a working group. Basement objectives are to be addressed initially. There may be some commonality with the RIDGE programme. It was encouraging to note that LITHP had ranked this proposal even though it had not yet been formally drafted. An international group of proponents is to be drawn together over the next few months.

[ACTION: WORTHINGTON, MORIN]

13. Next Meetings

The next DMP meeting is scheduled for 12-13 October 1990 in Townsville, Queensland, Australia. Key agenda items will be later CEPAC planning, the status of high-temperature logging developments, and the role of downhole measurements in contributing to scientific objectives. The meeting will be preceded by a joint meeting with SMP on 11 October 1990. The principal objective is to review and adopt the recommendations of the inter-panel working group on user requirements for the shipboard integration of core and log data (this group is due to meet on 29-30 August 1990). A ship tour is scheduled as part of the meeting.

The January 1991 meeting of DMP is tentatively scheduled for College Station so that discussions can be held with systems engineers on progress towards implementing the user requirements for the shipboard integration of core and log data, as adopted by the DMP/SMP joint meeting in October 1990.

The May 1991 meeting of DMP is proposed to encompass a joint meeting with a thematic panel. Mienert proposed that a joint meeting with SGPP would be highly topical and that the May schedule would be mutually convenient. Mienert is to raise this question with the SGPP Chairman.

[ACTION: MIENERT]

14. Liaison from TECP

In view of the high degree of commonality of DMP and TECP objectives, especially with regard to current drilling goals, a liaison from TECP to DMP would be highly beneficial.

DMP Recommendation 90/14

"A TECP liaison should be appointed to DMP."

15. Detailed Planning Groups

Without considered advice from LDGO and/or DMP, there is a renewed risk that the time needed for effective logging surveys will be underestimated at the planning stage.

DMP Recommendation 90/15

"A representative of LDGO and/or DMP should be present at DPG meetings to provide input on the nature and scheduling of downhole measurements."

16. Thematic Publications

The thematic issue of JGR, in which ODP downhole measurements are featured, is due to be published imminently.

Nagao informed the Panel that the review paper "Scientific applications of downhole measurements in the ocean basins" written by the Chairman and others, and originally published in the journal Basin Research, has been translated into Japanese and is to be re-published in a Japanese earth science journal for dissemination within the Japanese scientific community.

17. Fifth Annual Co-chief Scientists' Review Workshop

The Chairman drew attention to a recommendation from the above workshop:

"DMP should better scientifically justify their logging recommendations and get them into the planning process earlier so that their recommendations can be acted upon by PCOM at the time PCOM initially plans a cruise."

After some discussion, Panel concluded that this recommendation referred back to the Indian Ocean days when everything had to be planned on a short-fuse due to enforced changes in the ship's schedule.

With WPAC and CEPAC, DMP has been 2-3 years ahead of the cruises in its planning. Ninety per cent of all logging is standard and its scientific justification is implicit in the PCOM ruling to log holes greater than 400m in depth. If better scientific justification is needed for non-standard logging, it will hopefully be achieved through DMP Recommendation 90/15 (Agenda Item 15).

18. **Close of Meeting**

The Chairman thanked Members, Liaisons and Guests for their contributions to the meeting, the School of Oceanography of the University of Washington for their kind hospitality, and Dr D Cowan for his gracious hosting. The meeting closed at 2.50pm on Friday 29 June 1990.

PAUL F WORTHINGTON
6 July 1990

REPORT ON MEETING OF JOIDES TECHNOLOGY AND ENGINEERING DEVELOPMENT COMMITTEE

Salt Lake City
Utah

14 - 15 February 1990

1. Preamble

This meeting was attended in the capacity of liaison from the JOIDES Downhole Measurements Panel (DMP) to the JOIDES Technology and Engineering Development Committee (TEDCOM). Key aspects of the agenda were the evolution of the Diamond Coring System (DCS), scheduled for deployment on the EPR in early 1991, and the TEDCOM position as regards the ODP long range plan, particularly in connection with very deep drilling. These notes highlight those aspects of the meeting which have implications for the downhole measurements programme of ODP.

2. Operations Summary, Legs 126 - 129

Harding (ODP/TAMU) reported that the last four legs have been costly (lost drillpipe, BHAs, TV cameras, etc). Leg 126 provided the deepest penetration of any ODP drillhole to date. The sonic core monitor was run twelve times during Legs 127 and 128 with encouraging results. It has subsequently been modified and is now back out at sea on Leg 130. The sonic core monitor would allow partially recovered core to be assigned to its true position within the barrel. As such, it could make an important contribution to the effective integration of core and log data.

3. Status Report on Engineering Projects

Storms (ODP/TAMU) reported that the TAM straddle packer now resides within ODP's domain of reponsibility. A complete operations manual is being written. New operations manuals for the TAM drilling packer have been sent to the ship for first use on Leg 129.

The Navidrill has been renamed "Motor-driven core barrel" (MDCB). A third generation tool is targeted with residual engineering problems resolved. e.g. there is a need for an indication of the extent of penetration beyond the bit face, which at present is unknown.

A new side-entry-sub (SES) is being developed with capability for much larger loads, for putting both logging tool and cable through the side entry port, and for more efficient rigging up and down. The new SES was originally intended to be deployed on the Nankai Leg but this deadline will not now be met.

The pressure core sampler is being modified prior to deployment in Nankai. An external proposal is being progressed for a laboratory pressure chamber which would allow recovered core to be studied under in-situ conditions.

4. Unconsolidated Cohesionless Sediments

Stow (SGPP) emphasized the scientific need for full recovery of these sediments as opposed to the partial recovery (<50%) which has been the case at several sites. These sands are cased out and are therefore not fully logged. A promising venture is the vibra-percussive coring (VPC) project, contracted to Novatek, Salt Lake City, which is at the prototype stage.

5. Diamond Coring System (DCS)

Howard (ODP/TAMU) reported that the DCS phase II with a drilling capability of 4500 m water depth is advancing strongly. Hole size is 3.96 inches: core size is 2.2 inches. The DCS test rig is to be visited as part of this meeting. The technology cannnot yet be regarded as proven for drilling and core recovery in very hot environments such as on the EPR and at sedimented ridge crests.

Storms (ODP/TAMU) reported that the second engineering leg is dedicated to shipboard testing of the DCS: no other tools are to be tested. Three drillsites are scheduled: Eng-5 (Bonin), Eng-6 (Shatsky Rise), Eng-7 (M.I.T. Guyot). Aims are to evaluate the DCS in water depths from 1000 - 3000 m in three distinct geological environments: bare/fractured crystalline rock, interbedded chalk/chert, and atoll/guyot carbonates.

The current DCS platform concept is expected to be operated for 2 - 3 years. Thereafter, it is anticipated that the platform will be removed in favour of a system with riser tensioners, which would be more efficient. The DCS will only be deployed where conventional drilling practices cannot satisfy scientific requirements.

6. Very Deep Drilling Objectives

Natland (PCOM), representing LITHP interests, reported that COSOD II had identified full crustal penetration by the year 2000 as a priority target. The JOI-USSAC Deep Drilling Workshop held in 1989 suggested that this objective cannnot realistically be achieved before 2005.

For this deep penetration, the crust must be of moderate age (20 - 50 Ma), depth and temperature. We would need a longer drillstring (9.5 km by 1998, 11.5 km by 2003), longer logging cables, slimhole logging tools, and smaller diameter fluid samplers.

If all this is to be feasible, we urgently need 6 km - hole feasibility studies. For example, logging tool modifications should begin now: a post-performance evaluation of existing logs should be

progressed as a guide to future tool developments. These studies would require 2 - 3 meetings to deal with overall performance evaluation. A report should subsequently be prepared for publication.

7. Long-Term Planning of Technological Developments

Sawyer (TECP) reported that TECP do not have a specific goal as regards deep drilling. TECP has identified, inter alia, the following technology needs:-

- collection of undisturbed, oriented core;
- packers for in-situ pressure measurement, flow testing and fluid sampling;
- instrumentation for long-term monitoring of temperature, fluid flow and seismicity;
- improved in-situ stress and strain measurement.

In particular, an increased use of the borehole televiewer, possibly in conjunction with packer-hydrofracture programmes, was advocated.

Normark (SGPP) stated that SGPP had not formulated a policy on needs from deep holes. In general, it is important that needs are not merely identified but placed in order of priority. SGPP sees the sand recovery problem as its highest priority.

TEDCOM concluded that LITHP, TECP and SGPP liaisons should attend TEDCOM meetings on a regular basis.

8. Update on High-Temperature Downhole Measurements

Worthington (DMP) reported that the operating ranges of commercially available tools did not encompass the estimated temperatures in boreholes at EPR and sedimented ridges, i.e. 350°C. Even if they did, the (wireline) cable is limited to 300°C, although special cables such as MgO have higher ratings. Other options are to cool the hole and/or to cut thermally damaged cable after each deployment, logging downwards. EPR and sedimented ridge "hot" holes are scheduled to be drilled with the DCS. It may be necessary to drill/ream a larger diameter hole at each DCS site for logging and/or cooling. If the scientific needs for downhole measurements at EPR and sedimented ridges are to be met, remedial technology must be developed. Options are simple analogue tools (no downhole electronics but need for a cable), dewared tools (cable also required), or memory tools (no cable).

A two-level future strategy is being pursued. In the short term (1 - 2 years) it is proposd to address those objectives identified by LITHP which might be achieved using existing technology. These are

temperature and pressure (a modified version of the Sandia slimhole memory tool rated to 400°C), formation resistivity (dewared slimhole tool but restricted to 300°C because of cable limitations), and fluid resistivity (at present under evaluation). It is also proposed to address a principal requirement of the Sedimented Ridges DPG for a high-temperature fluid sampler. In the long term (5 - 10 years) memory tools for natural gamma radioactivity, formation resistivity, seismic velocity, caliper and flowmeter studies will all be required with temperature ratings in excess of 350°C. The most promising avenue towards funding is through interprogramme collaboration. This is currently being explored.

In conclusion, a scientific requirement for a high-temperature logging capability in sub-ocean studies is inevitable, although the diametral constraints on logging tools will not become fully clear until the DCS is proven and the reaming option has been evaluated. The short-term target capability of slimhole temperature, pressure, resistivity and fluid-sampling tools is inadequate to meet scientific needs. Attainment of a useful long-term high-temperature downhole-measurements capability depends on the availability of co-mingled funds. An international task force is needed to bring this initiative to fruition in the long term.

9. Next TEDCOM Meeting

Target date is September 1990; suggested venue is College Station.

Paul F Worthington

19 February 1990

SYNTHESIZED MESSAGES FROM NANKAI

JOIDES Downhole Measurements Panel

There are two key issues, drilling technology and tool performance.

Drilling Technology

Hole instability or hole closure is a serious obstacle to successful downhole measurements in accretionary prisms and ODP has not so far dealt with the problem satisfactorily. Problems of hole instability have previously been encountered on Leg 110 (Barbados).

On Leg 131, hole closure was the main cause of the inability to conduct the logging and downhole measurements programme and this is shown by the fact that only 200 meters of open hole could be logged. Clearly, it would be unreasonable to plan the Cascadia legs unless a new strategy to drill loggable holes in accretionary prisms is put forward. Suitable methods should be studied and tested in advance. This point is essential and is a first lesson. Possible causes of hole closure on Leg 131 included clay swelling (role of ash layers?), formation overpressure, and large compressive or shear stresses. The use of a heavy mud and the deployment of casing by steps in the hole at different times of drilling were two suggested solutions.

Some thought should be given to the problem of drilling for core recovery and drilling for logging purposes. In the former, geochemists are concerned about potential contamination of the cores with drilling mud and the potential bias that this may cause in the pore water chemistry. In the latter, one would want to use drilling mud as soon as possible. Although, of course, less territory will be covered by drilling two separate holes next to each other, the time has come to substitute quantity with quality. If only we had been successful in Nankai with the second hole (i.e, the logging hole), we would have had the ideal solution. The Engineering Advisory Group should consider this problem. They may suggest ways to optimize both objectives.

Tool Performance

Packer Experiments

Packer measurements were intended to provide information on pore fluid pressure and bulk permeability within the accretionary complex. We elected to make use of the TAM Rotable Packer (TRP) rather than the proven TAM Straddle Packer (TSP) because (1) setting the TSP charges the isolated zone with a pulse of pressurized fluid which would have jeopardized our ability to measure formation pressure, and (2) we intended to set the packer several times in open hole and were concerned that the TSP would be endangered should the hole become unstable. The TRP had recently been modified to use a "no-pulse" go-devil which would not disturb the isolated zone below the element during setting operations. Unlike the TSP, however, the TRP requires that the seals on the go-devil remain intact throughout the experiment in order for pressure to be maintained in the inflation element.

Excessive vibracion of the pipe, due to the Kuroshio Current, caused the four go-devil seals to be damaged and stripped away during the time that the go-devil was falling down the drill pipe. In addition, collapse of a significant portion of the open section of the hole below the casing shoe apparently displaced mud upwards into the packer element, eventually clogging the ports and preventing later deflation and inflation attempts. A partial set was achieved on the first inflation attempt, during which the packer supported approximately 15,000 lbs of weight, but the element would not continue to support weight once the zone below the packer was opened for testing.

A successful measurement of bulk permeability might have been completed using the TSP with a single set in the cased section of the hole, as this tool does not require a perfect go-devil seal in order to maintain pressure in the element. There would still have been ambiguity as to the fluid compressibility within, and size of, the test interval as it would not have been possible to clean out or even venture into much of the open hole with the TSP in the string. In the light of our experiences with the TRP on Leg 131, the design of the no-pulse go-devil is being reconsidered by ODP engineering.

Sediment Temperature, Pressure and Pore Fluid Sampling

The WSTP tool was deployed 12 times to measure temperatures and pressures and collect pore fluids. New recording packages were modified onboard the Resolution to collect temperature and pressure data at a high frequency. These packages proved to be unreliable, particularly for recording pore-pressure data, with a success rate of approximately 50%. In addition, a data distortion was introduced into temperature records during transfer of data between the new recording packages and the PC clone in the downhole tools laboratory, making data analysis difficult. All the recorders have now been returned to ODP for testing and modification to handle higher temperatures in anticipation of Leg 138 at the Juan de Fuca Ridge.

Screws and connectors backed off during WSTP tool deployments due to vibration of the drillstring. This problem eventually led to tool flooding and the loss of two electronics packages. The actual location of the leak(s) is still not known, but they may be in the front bulkhead or in the end of the core barrel that serves as a pressure case for the WSTP tool. An empty case will be tested at sea during Leg 132 to locate the leak, which will be fixed before additional recorders are risked.

The WSTP tool failed to obtain useful water samples during Leg 131, though not due to any failure in the operation of the tool itself. In several instances the tool was returned with borehole fluid rather than formation fluid, probably because the tool was seated in fill at the bottom of the hole or cracked the formation during insertion. In other instances the tool returned without a fluid sample, apparently because of the low fluid content and low permeability of the formation. The ODP is machining a modified filter block, which will be longer and somewhat narrower, to improve WSTP fluid sampling capabilities. The tools will also be fitted with titanium tubing, filters and components for use in high-temperature, corrosive environments. The complete WSTP tools will be returned to ODP following Leg 134 or 135 so that modifications and testing can be completed under controlled conditions.

General

Although we expected less that 100% success in logging efforts during Leg 131, the euphoria about the very nice sediment recovery (as well as good pore water samples) was somewhat tempered by the less than satisfactory logging programme. Somehow we did quite well and with a better drilling technology we might also have obtained good logs. Perhaps it is not too late to think of Nankai-2. One could go back to Site 808 and carry out a good logging effort, drill a reference site and describe this interesting accretionary complex well and properly. If so, we should use appropriate drilling technology and tools that are of proven reliability in these difficult environments.

Collated by
PAUL F WORTHINGTON
13 July 1990

Leg 132
Engineering II
June 7 - August 5, 1990

The overall objective of a second engineering test leg will be to test newly developed tools and techniques necessary to attain the immediate program objectives in the central and eastern Pacific. The required engineering capabilities have been clearly defined by the Planning Committee as (a) the penetration and recovery of alternating layers of hard and soft material, such as chert and chalk sequences; (b) penetration and recovery of young, fractured crustal rocks; (c) recovery of unconsolidated sediments, such as shallow-water carbonates or sandy turbidites; and (d) coring and logging in hot, corrosive hydrothermal environments.

The highest priorities will be the testing of tools to penetrate and increase recovery in the chert/chalk sequences on Shatsky Rise, the Cretaceous reef corals at M.I.T. Guyot, and the young, fractured basalts in the Marianas spreading center. Because of the importance of these tests in attaining future high priority objectives, and because of the long transit times involved, this cruise is scheduled as a full length leg of eight weeks at sea.

Leg 133
Northeast Australian Margin
August 10 - October 11, 1990

Co-chiefs: Judy McKenzie (Swit.) and Peter Davies (Aust.)

The primary objective of drilling on the northeast Australian margin and Queensland Trough/Queensland Plateau is to examine the sedimentary response to global sea-level changes of the late Cenozoic. The northeast Australian margin provides an opportunity for such a study in a mixed reefal carbonate/siliciclastic shelf sediment regime. During periods of lowered sea-level, deltaic progradation occurred at the shelf edge accompanied by fan deposition on the middle and lower slope. These sedimentary sequences are well imaged seismically, and drilling will provide the detailed stratigraphy necessary for interpretation of the sedimentary facies. Sites on the upper slope above the hinge line of tectonic subsidence will provide a strong signal of sea-level history. Sites on the lower slope and in the Queensland Trough will provide the relationship between the sea-level signal and seismic sequences and the change from slope to basin environment.

Leg 134
Vanuatu Region
October 16 - December 17, 1990

Gary Greene (USA) and Jean-Yves Collot (France)

A scientific theme of major tectonic interest is the nature of collision at plate boundaries where a continent, a large seamount, or other feature thicker than normal oceanic crust cannot be subducted at a trench. The principal objectives of the drilling on Leg 133 include the study of the processes involved in the collision of an aseismic ridge and a guyot with an island arc including the collision itself, backarc rifting, reversal of subduction direction and the formation of intra-arc basins. In the Vanuatu region these wide-ranging objectives can be investigated within a relatively small area.

Six sites are scheduled for drilling during this cruise. Site DEZ-1 will provide a reference section of rocks of the D'Entrecasteaux Ridge. Site DEZ-2 will penetrate the lowermost accretionary wedge, the interplate thrust fault, and the ridge itself. This site will show if the ridge rocks have been accreted onto the arc, as well as provide the age and mechanical properties of rocks where, despite the great relief of the subducted ridge, the collision has caused little forearc deformation. Sites DEZ-4 and DEZ-5 are located where a guyot has collided with the arc, causing considerable forearc deformation. Site IAB-1, in the center of Aoba Basin, and IAB-2a (or b), along the basin's eastern flank, are located where sediments, including volcaniclastics and their unconformities, will give a record of the late Cenozoic tectonic and magmatic evolution of the arc.

Leg 135
Lau Basin
December 20, 1990 - February 18, 1991

Jim Hawkins (USA) and Lindsay Parsons (UK)

The Lau Basin was the first backarc basin in which active seafloor spreading was documented nearly 20 years ago. It is one of the best developed regions of backarc spreading in the world. A drilling transect of six sites across the active region of spreading and into the forearc of the Tonga Trench will provide the opportunity to investigate processes of crustal generation. These processes include changes in composition of both basement basalt and overlying sediments during opening of the basin, and the relationship of each to the basin's tectonic history; the time-transgressive character of basin opening and its relationship to magmatic evolution and vertical tectonic history of the adjacent arc; and the geochemically distinctive and widespread volcanism which forms the basement of the oceanic island arcs.

Leg 136
Oahu Hole and Engineering 3A (Hole 504B)
Oahu Hole: March 4 - March 18, 1991
Engineering 3A: March 18 - April 21, 1991

Co-Chief Scientists: To be named

This cruise is divided into two parts. The first part will drill a hole on the Hawaiian arch 270 km northeast of Oahu, Hawaii, as a site for ocean seismic network (OSN) pilot experiments. A broad-band seismometer, to allow remote sensing of the physical properties of Earth's deep interior, will be emplaced in this hole at a later date. This seismometer will improve source location, focal mechanism, and rupture process determinations critical for studies of the depth of the seismic decoupling zone, the depth extent of outer rise events, and the rheology of the oceanic lithosphere. Near field data will improve the resolution of source mechanisms of events caused by slumping or magmatic injection. The proposed site location combines the advantages of proximity to a high-quality Global Seismic Network (GSN) station in the Kipapa tunnel with excellent logistical support available from the Hawaii Institute of Geophysics. The Oahu hole is located in approximately 4,500 m of water with a 150-200 m sediment thickness. The hole will be drilled 50-100 m into igneous basement, and will then be cased through the sediment section and down into competent basement material.

The second part of Leg 136 is dedicated to cleaning out junk left in the bottom of Hole 504B during Leg 111. Prior to these operations, two or three days of downhole experiments will be completed in Hole 504B. These experiments include temperature and permeability measurements and fluid sampling. If the fishing/milling operations to clean Hole 504B are successful, the hole will be deepened during a later leg (Leg 139?).

Leg 137
Eastern Equatorial Pacific
April 21, 1991 - June 26, 1991

Co-Chief Scientists: Dr. Larry Mayer (Dalhousie University, Halifax, NS, Canada)
Dr. Nicklas Pisias (Oregon State University, Corvallis, OR)

Leg 137 will drill two transects of sites to obtain continuous undisturbed sedimentary sections. The primary objective is to study the Late Cenozoic paleoceanography of the eastern equatorial Pacific Ocean, an important complement to the transects already drilled in the equatorial Atlantic and the Indian Ocean monsoon region. The proposed sites focus on the evolution of climates when the earth changed from an essentially non-glacial world to one dominated by extensive glaciation in the high latitudes. The sites will sample sediments under each of the major oceanographic features of the equatorial region: the North Equatorial Current, the South Equatorial Current, North Equatorial Counter Current, the Peru Current extension, the equatorial divergence, and the Costa Rica Dome. The proposed western transect, at 110°W, spans the equatorial current system where it is fully developed, but is far enough east to have relatively high sedimentation rates (1-3 cm/k.y.) and good preservation of microfossils. Circulation in the area of the eastern transect, at 90-95°W, is not as well developed and the influence of the Peru Current can still be identified. Sedimentation rates in the transect are higher (2-5 cm/k.y.) due to higher biogenic productivity and closer proximity to the continents.

Six sites are proposed for the western transect; four sites and two alternatives are proposed for the eastern transect. Plate reconstruction models that trace these sites back through time indicate that

these sites remain within present water masses if no oceanographic changes had occurred during the Neogene. Thus, these sites will provide a continuous record of the eastern tropical Pacific current systems throughout the past 8 to 10 million years.

Leg 138
Sedimented Ridges I
June 26, 1991 - September 2, 1991

Co-Chief Scientists: Dr. Earl Davis (Pacific Geoscience Centre, Sidney, BC, Canada)
Dr. Mike Mottl (Hawaii Institute of Geophysics, Honolulu, HI)

Sediment-covered spreading centers provide an unparalleled opportunity for quantitative studies of the fundamental physical and chemical processes associated with submarine hydrothermal systems. A regionally continuous, relatively impermeable sediment cover over zero-age crust limits the recharge and discharge of hydrothermal fluids, and conductively insulates the underlying crust. Where discharge of fluids does occur, very large hydrothermal sulfide deposits can be produced. The sediments may also preserve a relatively continuous stratigraphic record of magmatic, tectonic, and thermal events, providing clues to the spatial and temporal variability of these processes. The drilling program planned for sedimented ridges will provide information on all of these processes; however, it is aimed primarily at investigating hydrothermal problems. Specifically, the two highest priority objectives are (1) characterizing the fluid flow and geoche-mical fluxes within a sediment-dominated hydrothermal system in three dimensions, and (2) investigating the processes involved in the formation of sediment-hosted massive sulfide deposits.

The Sedimented Ridges Detailed Planning Group (SR-DPG) has selected the Middle Valley on the Northern Juan de Fuca Ridge and the Escanaba Trough along the Southern Gorda Ridge as the best locations to study these processes. Leg 138 will drill seven sites in the Middle Valley (MV1-MV7), where regional structure and hydrothermal characteristics are particularly simple, crustal temperatures are high, and massive sulfide deposits are present that are not in direct contact with intrusive or extrusive volcanic rocks. Extensive downhole measurements and fluid sampling programs will be carried out. A second leg, to drill sites in the Escanaba Trough, is tentatively planned for drilling at a later date.

Leg 139
Engineering 3B (East Pacific Rise) or Hole 504B
September 2 - November 6, 1991

Co-Chief Scientists: To be named

One alternative plan for Leg 139 is to conduct engineering and logging test operations at the East Pacific Rise. Specifically, the leg will be dedicated to setting a bare-rock guidebase (HRB) and establishing a drill hole for one (and possibly both) of the two prime sites planned for drilling on the East Pacific Rise. This site will be in the 9°30'N latitude region, but whether it will be located directly on the ridge axis or ~1 km off-axis awaits results of additional pre-cruise seismic data to be collected in early 1991. Additional testing of drilling and logging developments, such as further improvements to the diamond coring system and high-temperature logging and fluid sampling tools, will also be conducted. Potentially, two mini-HRBs could be deployed for DCS drilling.

Depending on the results of Leg 136, an alternative plan for Leg 139 is to drill deeper into the crust at Hole 504B. A primary objective of JOIDES and ODP is to core as deeply as possible beneath the ocean floor to constrain seismic and petrologic models of the structure and evolution of the oceanic crust. Lithologic/petrologic interpretations of oceanic Layer 3 are based on seismic profiles and ophiolite analogues. As ophiolites in many cases formed in supra-subduction settings, there is a

critical need to sample Layer 3 directly by deep drilling. Drilling at Hole 504B addresses this objective, as it represents a classic crustal profile and has significant drilling and downhole measurement efforts already invested. Hole 504B has penetrated more than twice as deep into oceanic basement as any other DSDP or ODP section and is the only hole that reaches the sheeted dikes of Layer 2C. An oblique seismic experiment during ODP Leg 111 indicates that Layer 3 gabbros probably lie a few hundred meters below the present total depth of 504B (1287.8 meters into basement), within reach of the drill bit. Therefore, the primary goal of Hole 504B drilling is to core into Layer 3 and to log continuously the newly cored section.

SUMMARY OF FY91 CRUISES

LEG	LOCATION	DEPARTS	PORT	ENDS	PORT	CO-CHIEFS
133	NE Australian Margin	8/10/90	Guam	10/11/90	Townsville	P. Davies J. McKenzie
134	Vanuatu	10/16/90	Townsville	12/17/90	Suva, Fiji	J.-Y. Collot G. Greene
135	Lau Basin	12/22/90	Suva	2/18/91	Suva	J. Hawkins L. Parson
136	Transit OSN-1 Engineering 3A	2/19/91 3/04/91 3/18/91	Suva Honolulu Honolulu	3/01/91 3/18/91 4/21/91	Honolulu Honolulu Panama	-- TBN TBN
137	East. Eq. Pacific	4/27/91	Panama	6/26/91	San Diego	L. Mayer N. Pisias
138	Sedimented Ridges I	7/01/91	San Diego	9/02/91	Victoria	E. Davis M. Mottl
139	Engineering 3B or Hole 504B	9/07/91	Victoria	11/06/91	Panama	TBN TBN

JOIDES SITE SURVEY PANEL MINUTES
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY, New York

July 12 and 13, 1990

Members: Kidd, Rob (Cardiff, UK) Chairman
Larsen, Birger (Copenhagen, ESF)
Lewis, Steve (USGS, Menlo Park, USA)
Louden, Keith (BIO, Canada)
Meyer, Heinrich (BGR, FRG)
Moore, Greg (HIG, USA)
Hirata, Naoshi (Chiba University, Japan)
von Herzen, Dick (WHOI, USA)

Liaisons: Brenner, Carl (Site Survey Data Bank - Host)
d'Ozouville, Laurent (JOIDES Office)
Watkins, Joel (PCOM)
Ball, Mahlon (PPSP)
Meyer, Audrey (ODP/TAMU)
Moran, Kate (SMP)

Guests: Blum, Peter (JOIDES Office, UT)
Collins, John (WHOI)
Gillis, Kathy (WHOI)
Fornari, Dan (LDGO)
Bangs, Nathan (LDGO)
Caress, Dave (LDGO)
Mutter, John (LDGO)

Apologies received from:
Guy Pautot (IFREMER, France)
Kim Kastens (LDGO, USA)
Jim Hedberg (EXXON, Houston, USA)

SSP Executive Summary
LDGO, New York, July 1990

The aims of the Site Survey Panel's Lamont-Doherty meeting were to update assessment of the CEPAC programs and to assign SSP "watchdogs" to the highest ranked North Atlantic programs as defined by PCOM at its April '90 meeting. Major additional items of business were survey assessments of three proposals new to SSP: Hess Deep, Peru Margin Gas Hydrates and the OSN pilot hole off Oahu.

For a number of the CEPAC programs, either SSP approval has already been given or there were no developments since the previous SSP meeting (April). For some proposals, however, final site locations are still to be reviewed.

Data presentations were made for the three new proposals: the Oahu pilot hole (Collins, WHOI), Hess Deep (Gilliss, WHOI; Caress & Mutter, LDGO) and Peru Margin Gas Hydrates (Brenner on the data package sent by von Huene, GEOMAR).

SSP made its first consideration of the highly ranked North Atlantic drilling proposals as identified by PCOM at their April meeting. Track charts of the Data Bank's holdings were produced. In most cases, substantial input of data from the proponents is still expected. Data packages for the North Atlantic programs will range from the fairly simple to the enormous. The Barbados and broadly-defined "N. Atlantic Conjugate Passive Margin Drilling" proposals are particularly data-intensive, in that they address several different thematic objectives or investigate several different regions, or both.

SSP "watchdogs" were assigned to specific North Atlantic proposals after protracted discussion on potential conflicts-of-interest. It was agreed to recommend SSP liaisons to DPG's.

The following consensus items arose from the meeting:

SSP CONSENSUS: Comments arising during SSP evaluation of survey packages with regard to potentially adverse downhole or oceanographic considerations should always be flagged by this panel (e.g., SSP's comments on bottom current regimes at the Northeast Australian Margin).

SSP CONSENSUS: ODP/TAMU is encouraged to conduct thorough oceanographic studies of regions scheduled for drilling, even if prior

Program experience or proponent advice suggests that no weather- or current-related problems will occur.

SSP CONSENSUS: The SSP Chairman should respond to PCOM's call for nominees to DPG's with a recommendation that an SSP member be appointed as liaison with each. For specific meetings SSP may alternatively recommend that the Data Bank manager attend. SSP must maintain both active communication with DPG's and its *independent* advisory position on the adequacy of data packages.

SSP CONSENSUS: Preliminary CHILE TRIPLE JUNCTION site locations are unchanged after PPSP preview. Proponents should now respond to the specific data recommendations from PPSP, and should also provide the SCS watergun reflection profiles that image the BSR in regions where CDP processing tends to degrade BSR imaging.

SSP CONSENSUS: No further data gathering requirements are foreseen by SSP for the CASCADIA MARGINS. Final SSP approval will await "official" site selection and the presentation of the full data sets at our next meeting.

SSP CONSENSUS: The critical data for the NORTH PACIFIC NEOGENE program are in hand. The seismic reflection data are poor for a number of sites, but are still judged as sufficient for the drilling objectives as long as high-quality seismics are run by the drillship on arrival and departure from the sites.

SSP CONSENSUS: The necessary data for the siting of the OSN PILOT HOLE (at either of the two proposed locations) probably exists. Full site survey data packages must be available for review by SSP and PPSP in September.

SSP CONSENSUS: Additional geophysical data, primarily detailed seismics to better characterize crustal structure and possible existence of rubble, are needed to assure drilling objectives in the HESS DEEP. Most of these requirements would be met if the Caress, et.al. proposal is funded. Although 2 MCS lines are proposed, the panel feels that at least 4 lines are needed (2 ea. orthogonal and 2 ea. parallel to the spreading axis) to establish whether the sections drilled are typical of the area. Deep-towed side-scan sonar is also needed to determine continuity of surface fabrics and to tie into MCS lines. SSP recommends that any transponder beacons deployed during upcoming cruises be left to aid site location for the drillship.The panel is concerned about the time needed to acquire and

assimilate the required survey data, and believes that drilling should not be scheduled before late 1992.

SSP CONSENSUS: SSP concludes that the data set for the PERU GAS HYDRATES proposal is more than adequate for drilling. The Panel recognizes the importance of this proposal, not only for what can be learned from this specific area, but for its impact on future drilling in areas marked by the presence of BSRs.

SSP CONSENSUS: SSP members may serve as "SSP watchdogs" on proposals for which they are "minor" proponents, but not for proposals in which they may be seeking funds for future survey activity.

AGENDA FOR SSP MEETING
July 12th and 13th, 1990
LAMONT-DOHERTY GEOLOGICAL OBSERVATORY, New York

FIRST DAY

1. PRELIMINARY MATTERS

    1. Introductions (Kidd): Aims of Meeting
    2. Logistics (Brenner)
    3. Changes in minutes of previous meeting and matters arising
    4. Updated ship schedules
    5. Other business for Agenda
    6. Membership

2. REPORTS

    1. PCOM (Watkins)
    2. JOIDES (d'Ozouville)
    3. TAMU (A. Meyer)
    4. PPSP (Ball)
    5. DATA BANK (Brenner)

3. STATUS OF SCHEDULED LEGS (FY91)

    1. Leg 136 - Suva-Honolulu transit and Engineering 3A near Oahu and at 504B (A. Meyer)
    2. Leg 137 - E. Pacific Neogene (H. Meyer/Brenner)
    3. Leg 138 - Sedimented Ridges I (Louden)
    4. Leg 139 - 504B or Engineering 3B (EPR)
        - Presentation of EPR near bottom survey data (Fornari/Lewis)

4. STATUS OF REMAINING CEPAC PROGRAMS (FY 92 and beyond)

    1. Atolls, Guyots and Aprons (Brenner)
    2. Bering Sea (Larsen)
    3. Chile Triple Junction (Lewis/Banks)
    4. Cascadia Margins (Louden)
    5. N. Pacific Neogene and older (Larsen)
    6. East Pacific Rise (Lewis)
    7. Sedimented Ridges II (Louden)

SECOND DAY

5. "NEW" CEPAC PROGRAMS; DATA PRESENTATIONS

   1. Hess Deep: Layer 2/3 Transition and Layer 3 (Gillis)
   2. Peru Gas Hydrates (Brenner/Ball)

6. DISCUSSION AND RECOMMENDATIONS ON PRESENTATIONS

   1. OSN Hole, Oahu
   2. Hess Deep
   3. Peru Gas Hydrates

7. ASSIGNMENT OF N. ATLANTIC PROGRAMS TO SSP 'WATCHDOGS'

   -Approach to Watchdog Activity (Kidd)
   -General status of data supporting each proposal (Brenner/d'Ozouville)
   -Agreed assignments (Kidd)
   -Watchdog Liaison with DPG's

8. NEXT MEETING & MISCELLANEOUS ITEMS

LDGO SSP MEETING
ACTION ITEM LIST

Item #	Person(s)	Action
1	Kidd/Ball	Kidd will entertain any nominations for a US petroleum industry SSP member from current members. Ball agreed to canvas his contacts and communicate a name to Kidd. Kidd will communicate these to USSAC.
2	Kidd	Write to PCOM Chairman recommending SSP liaisons to DPG's.
3	Louden	Contact Earl Davis for update of recent Sedimented Ridges cruise results from side-scan survey and ALVIN dives.
4	Brenner/Louden	Brenner will meet with Collins to bring together the two Oahu data packages by early September. Louden will visit the Site Survey Data Bank to undertake a final SSP review prior to the scheduled mid-September PPSP meeting.
5	Hirata/Kidd	Hirata to investigate arrangements for hosting the next SSP meeting in Tokyo. Kidd to write to PCOM Chairman Moberly notifying him of requested locale and provisional dates of 12-14 March.

1. PRELIMINARY MATTERS

1. Introductions. The meeting began at 0900. Chairman Rob Kidd welcomed new member Greg Moore (HIG) and future JOIDES Office liaison Peter Blum, who will work with PCOM Chairman Jamie Austin at the University of Texas at Austin. Kidd thanked participants for their efforts in accommodating the two day shift in the dates of this meeting. Apologies had been received from members Pautot and Kastens, both presently at sea.

2. Aims of the Meeting. Kidd noted that the major results of the PCOM April meeting in Paris relevant to SSP activities were that PCOM had indeed outlined a 4-year plan that SSP could now use to assign new "watchdogs" to specific Atlantic proposals, but that the Committee had also introduced three proposals for possible FY92 drilling in the CEPAC program. Consequently, SSP's first priority at this meeting will be to assess data from these three proposals in an attempt to bring them up to the standard of the other CEPAC packages. One of the three- the Oahu OSN pilot hole- was in reality an engineering insertion in the FY91 schedule. Kidd had invited proponents for all three of the new proposals to present survey data at LDGO and he welcomed John Collins (WHOI) to present the Purdy, et.al. OSN proposal data. Roland von Huene was unable to attend to present the Peru margin data but sent a data package to Brenner for presentation on the second day. Kathy Gillis will attend on day two to present data in support of the Dick, et al. Hess Deep proposal. In addition, Dave Caress will present information on his already-submitted NSF proposal to do MCS and Hydrosweep work in the Hess Deep area.

3. Logistics. Carl Brenner as host outlined plans for meals and arrivals of invited presenters. SSP members were invited to familiarize themselves with the Site Survey Data Bank, its personnel and data. Kidd complimented Brenner on his acquisition of special hotel rates for meeting participants.

3. Menlo Park Minutes. No changes to the minutes of the Menlo Park meeting were required and all matters arising were judged to be already included for discussion at LDGO.

4. Updated Ship Schedules. Because the last SSP meeting was held so recently, the only new ship schedule was that from H. Meyer on West German ship activity (Appendix A).

5. Other Business. Kidd recommended that discussion of current and future SSP membership be added to the agenda.

6. Membership. Kidd noted that PCOM had invited both Greg Moore (HIG) and Anne Trehu (Oregon State) to join SSP as U.S. members. Both had accepted but

Trehu was unable to undertake membership until summer of 1991. Hedberg has been unable to attend any SSP meetings since accepting an invitation to join as US petroleum industry representative nominated by USSAC. PCOM was now awaiting a new nomination from USSAC. Kidd asked members for any suggestions for nominees that he could communicate to USSAC Chairman Jeff Weissel.

*ACTION ITEM 1: KIDD WILL ENTERTAIN ANY NOMINATIONS FOR A US PETROLEUM INDUSTRY SSP MEMBER FROM CURRENT MEMBERS. BALL AGREED TO CANVAS HIS CONTACTS AND COMMUNICATE A NAME TO KIDD. KIDD WILL COMMUNICATE THESE TO USSAC.

2. REPORTS

1. PCOM (Watkins):

PCOM accepted the 5 highest ranked proposals by LITHP, OHP, SGPP and TECP for tentative inclusion in the future drilling plan. These proposals are:

LITHP:
1) Hess Deep
2) [tie] EPR and MARK
4) TAG
5) Sedimented Ridges

OHP:
1) Northernmost Atlantic Paleoceanography
2) North Pacific Neogene
3) New Jersey Margin Sea Level
4) Mesozoic Guyots
5) Bering Sea

SGPP:
1) Cascadia
2) Chile Triple Junction
3) Atolls and Guyots
4) Sedimented Ridges
5) New Jersey Margin Sea Level

TECP:
1) Chile Triple Junction
2) North Atlantic non-volcanic margins
3) Cascadia
4) Seismometer emplacement near Oahu
5) North Atlantic volcanic margins

PCOM approved a plan in which the RESOLUTION will drill in the Pacific through late 1992, then transit to the Atlantic in the spring of 1993 where it will drill until the end of the current planning period in April, 1994.

PCOM approved in principle a 2-week mini-leg north of Oahu to drill a hole for emplacement of a seismometer.

Four new subgroups were approved for future staffing:

1) North Atlantic Rifted Margins DPG
2) Arctic Gateways DPG
3) Sea Level WG
4) Deep Drilling WG

PCOM asked that SSP pay particular attention to adequacy of site surveys in areas where near-surface rubble is expected and asked that SSP flag potential rubble-related problems.

2. JOIDES Office (d'Ozouville)

As agreed at the previous SSP meeting, the JOIDES Office has begun to forward officially to the contact proponents, or to the co-chief scientists of upcoming legs, the comments on the site survey data packages that have been discussed during each SSP meeting. SSP recommended that this procedure should be continued.

d'Ozouville distributed to the panel members a document (abstract and maps) synthesizing information contained in the proposals of the highest ranking North Atlantic Programs (the top 5 North Atlantic rankings of each thematic panel, April 1990).

He reported that over the last two months the JOIDES Office has received only four proposals, two of which are new proposals. He reminded the panel that the JOIDES Office will move from the University of Hawaii to the University of Texas at Austin on 1 October 1990. He was very pleased that his successor, Peter Blum, nominated by Japan, was able to attend this SSP meeting. He presented his best wishes of success to Peter in this new position.

3. TAMU Report (A. Meyer)

A. Recent JOIDES Resolution activities:

Leg 131 occupied seven holes at Site 808 (proposed site NKT-2) in the Nankai Trough during the period 1 April - 2 June, 1990. Operations were hampered by strong winds, variably strong currents (up to ~ 4 knots) that induced significant pipe vibration, and unstable hole conditions. The strength of the currents was somewhat unexpected, as prior DSDP drilling in the region had not encountered such currents and advice to ODP/TAMU had indicated that Leg 131 would not be significantly different. Despite these problems, drilling results at Site 808 successfully established a middle Miocene (15.6 Ma) age for basement, mostly hemipelagic sedimentation from middle Miocene to Pleistocene time, and the onset of major turbidite deposition beginning less than 0.5 million years ago. The frontal thrust fault (intersected at 365 mbsf) occurs within an overturned fold sequence and has 145 m of vertical throw, whereas the decollement occurs as a 20m-thick zone between 945-965 mbsf, within a homogeneous hemipelagic sequence. The style and orientation of structural features change with depth and with time, with small faults predominating in the deeper section and shear bands being more common at shallower depths. Porosity and bulk density curves show major discontinuities at the thrust (reflecting the recent offset of the sediments) and immediately below the decollement (perhaps indicating high pore pressures at this level). The first *in situ* measurements of stress and pore pressure in an accretionary prism should help constrain deformation and compaction models. Interstitial pore water data show a lack of strong evidence for active, channeled fluid flow along the major (and minor) fault zones at this location. This suggests that fluid expulsion in the Nankai prism may be primarily from diffusive flow. A major chloride minimum associated with the decollement may imply a past fluid flow event. Hydrocarbon gas distributions suggest maturity levels higher than predicted from the present calculated geothermal gradient. Temperature measurements indicate a present heat-flow which agrees well with a conductive cooling model for oceanic lithosphere (See Appendices B and C).

The main SSP discussion of Leg 131 revolved around how best to predict the current-related problems and to flag potential unstable hole conditions. In both cases there was a feeling that proponents and even some of the other JOIDES panels might tend to gloss over potential difficulties. SSP and PPSP were best suited to ensure that these issues were at least flagged by the panel system, and SSP had the most lead time.

SSP CONSENSUS: Comments arising during SSP evaluation of survey packages with regard to potentially adverse downhole or oceanographic considerations should always be flagged by this panel (e.g., SSP's comments on bottom current regimes at the Northeast Australian Margin).

SSP CONSENSUS: ODP/TAMU is encouraged to conduct thorough oceanographic studies of regions scheduled for drilling, even if prior Program experience or proponent advice suggests that no weather- or current-related problems will occur.

Leg 132 (Engineering II) left Pusan on 8 June. The first thing they did was return to Site 808 in the Nankai Trough; there they successfully deployed the ONDO tool in Hole 808E. The ship next moved to Site 809 (proposed site ENG-5) in the Bonin backarc on 13 June, and have thus far occupied six holes at that site (809A-809F). Holes 809A and 809B were 11-5/8" and 9-7/8" test holes. Hole 809C was the first hole where a "mini" hard-rock guidebase (HRB) was set down on pillow lavas. The HRB's reentry cone landed at an angle too steep to permit reentry, and the HRB settled down around the drill-in bottom-hole assembly as operations continued, so that reentry was obstructed. The drill-in BHA was "fished" and recovered successfully from the HRB. During further reentry attempts, the HRB's gimballed reentry cone was broken off the HRB. In separate operations, both the separated reentry cone and the HRB itself were recovered and pulled back aboard ship and refurbished. The refurbished HRB and reentry cone from Hole 809C were then reset at Hole 809D and the BHA was drilled in, but the hole ended when the male tensioning tool failed, leaving junk in the hole. The same mini-HRB and reentry cone were repositioned to begin Hole 809E, but the mini-HRB shifted on the seafloor, obstructing the BHA and ending operations at the hole. The HRB and reentry cone were then repositioned again and drill-in BHA was emplaced at Hole 809F. After a number of tests of the DCS secondary heave compensator, coring operations in Hole 809F began on 6 July and are continuing now. This cruise will end in Guam on 5 August.

B. Ship schedule:

The current official ship operations schedule for the JOIDES Resolution is shown in Appendix D. This schedule includes cruises scheduled by PCOM through Leg 139, as per changes made at their April 1990 meeting in Paris. Leg 136 is a two-part cruise, to establish a hole close to Oahu for emplacing an OSN seismometer at a later date and to clean out "junk" left in the bottom of Hole 504B by Leg 111. The Eastern Equatorial Pacific paleoceanographic transect is now scheduled as Leg 137, and Sedimented Ridges I is now scheduled as Leg 138. Leg 139 will either be an engineering leg at the East Pacific Rise to set a bare-rock guidebase and establish a drill hole for one (and possibly both) of the two prime sites planned for drilling, or a science leg to 504B (assuming Leg 136 is successful in cleaning out the hole).

C. Cruise scientific staffing:

770 scientists have sailed on the JOIDES Resolution through Leg 131 (see Appendix E). Not counting LDGO Logging Scientists and ODP/TAMU Staff Scientists, 49% of the U.S. scientists who have sailed are from JOI institutions and 51% of the U.S. scientists who have sailed are from non-JOI institutions. The "success rate" of U.S. applicants from JOI versus non-JOI institutions varies considerably from cruise to cruise, roughly averaging 30-40%.

The shipboard scientific parties are in place through Leg 135 (Lau Basin). Scientists for Legs 137 (eastern equatorial Pacific) and 138 (Sedimented Ridges I) will be invited in late July-early August. Scientists for Leg 136 (OSN hole/504B clean-out) will be invited after the August PCOM meeting.

D. ODP personnel changes:

Tim Francis joined ODP as the Deputy Director (replacing Lou Garrison) in late June.

E. Miscellaneous cruise planning pertinent to SSP:

Leg 133: Co-Chief Peter Davies has requested PPSP and PCOM approval for a new site (NEA-l0A/3) to better understand the Miocene sealevel story. His current thinking is that approved Site NEA-10A/2 will define the high sealevel part of the Miocene story (CDP 5802 on BMR Line 75/057), but that the corresponding low sealevel part of the story is best seen on the same line at CDP5963 approximately 1 km west of NEA-10A/2. He is proposing that drilling at Site NEA-l0A/2 be shortened to 300 mbsf and that the time saved be used to drill Site NEA-10A/3 between a depth of 790-960 msecs (160m at 2 km/sec interval velocity) after washing through the pelagic cap from the seafloor (See Appendices F and G).

SSP viewed with concern the lateness of this insertion but judged that it was within the package already approved by SSP and that the move was now a PPSP matter.

Leg 135: Proposed sites LG2, LG3, and LG6 ran into problems at the PPSP meeting in June. These sites will be reconsidered at a PPSP meeting scheduled for 9 - 10 August at ODP/TAMU; the Co-Chiefs' pre-cruise meeting at ODP/TAMU will take place immediately following the PPSP meeting.

Discussion ensued on whether SSP had erred in its consideration of the Lau Basin package. This was not seen as the problem. SSP approval was rightly given, but the co-chief scientists had not been sufficiently well-prepared in their presentation to PPSP. It is clear that however well SSP and PPSP spell out their guidelines for the preparation of data packages, proponents will frequently gloss over the requirements. Discussion was broadened to consider future procedures with the advent of DPG's and it was concluded that Steve Lewis's involvement in the EPR DPG and Chile Triple Junction Working Group had promoted excellent presentations for SSP and PPSP.

SSP CONSENSUS: The SSP Chairman should respond to PCOM's call for nominees to DPG's with a recommendation that an SSP member be appointed as liaison with each. For specific meetings SSP may alternatively recommend that the Data Bank manager attend. SSP must maintain both active communication with DPG's and its *independent* advisory position on the adequacy of data packages.

*ACTION ITEM 2: KIDD TO WRITE TO PCOM CHAIRMAN RECOMMENDING SSP LIAISONS TO DPG'S.

Leg 136: After discussions at the April PCOM meeting in Paris, this cruise has been divided into two parts. The first part (4 - 18 March, 1991) will drill a hole near Oahu as a site for ocean seismic network (OSN) pilot experiments. A broad-band seismometer will be emplaced in this hole at a later time. The exact location of this hole, and the coring and logging program that will be carried out at this hole are still being discussed (Appendix H). The second part of Leg 136 (18 March - 21 April, 1991) is dedicated to cleaning out junk left in the bottom of Hole 504B during Leg 111. Prior to these milling and fishing operations, two or three days of downhole experiments will be completed in the hole. These experiments include temperature and permeability measurements and fluid sampling. If the fishing/milling operations to clean Hole 504B are successful, the hole will be deepened during a later leg (maybe Leg 139?).

4. PPSP Report (Ball)

Ball responded to Audrey Meyer's suggestion that discussion of means of improving chief scientists' presentations at safety reviews was needed. Ball emphasized the importance of providing chief scientists with copies of Guidelines for Safety Reviews, JOIDES Journal, Vol. XIV, No. 4 Dec. 1988, p. 33-35 and Ocean Drilling Program Guidelines for Pollution Prevention and Safety, JOIDES Journal, Vol. XII, Special Issue No. 5, Mar. 1986, p. 1-39, in the initial set of documents sent to chief scientists. Ignorance or indifference on the part of chief scientists regarding

these guidelines is a main cause of problems with safety reviews. The requirement that written descriptions of location, structure, stratigraphy and possible safety problems, accompanied by Safety Review Check sheets, be mailed to Safety Panel members two weeks before the formal review meetings is frequently not met. Rob Kidd and Audrey Meyer will aid Carl Brenner in impressing the need for safety guideline knowledge on future chief scientists. Ball said he would also try to contact chief scientists prior to their safety reviews.

Ball reported the progress of PPSP's subcommittee composed of hydrocarbon chemists (George Claypool of Mobil, Barry Katz of Texaco, and Keith Kvenvolden of USGS) in expanding guidelines for monitoring hydrocarbon shows and updating policy regarding gas hydrate drilling. PPSP has agreed to preview existing proposals for drilling gas hydrates and to pass their impressions regarding safety aspects on to PCOM. PPSP will consider drilling gas hydrate sites like all other proposed sites- that is, on a case-by-case basis.

PPSP and ODP are pressing ahead on analyzing potential high temperature drilling problems connected with possible Cascadia drilling. This must be accomplished by the end of September in order to meet time requirements specified

PPSP will review ODP logging procedures and capabilities and the status of downhole tool developments at its August meeting.

5. Data Bank Report (Brenner)

Brenner stated that he had made a "first pass" through the highly ranked North Atlantic drilling proposals as identified by PCOM at their April meeting. Track charts of the Data Bank's holdings were produced. In most cases, substantial input of data from the proponents is still expected. Data packages for the North Atlantic programs will range from the fairly simple to the "monstrous." The Barbados and broadly-defined "N. Atlantic Conjugate Passive Margin Drilling" proposals are particularly data-intensive, in that they address several different thematic objectives or investigate several different regions, or both.

Brenner added that the TAMU and PPSP reports had covered the other issues he wished to raise, and expressed irritation over the fact that this was the first he had heard of the new Leg 133 site.

3. STATUS OF SCHEDULED LEGS (FY '91)

1. Leg 136: Suva - Honolulu Transit/Oahu Pilot Hole/Engineering 3- 504B

The Chairman welcomed John Collins (WHOI) to present data related to the Purdy, et. al. proposal for an OSN pilot hole near Oahu. Collins explained that the group had revised their preferred site locations and that two sites (north and south of Oahu) were now under consideration. Purdy had also responded to specific concerns raised by the PCOM Chairman, principally that sites in the Hawaii moat or near possible debris slide areas were unsuitable for the purposes of this experiment. SSP now recognized that the requirements included: 1) to be within 200-300 km of Oahu; 2) a sediment thickness of ~ 150m; 3) 50-100m of basement penetration for the instrument (away from the anomalous crustal structure of the Hawaii Ridge); and 4) avoidance of potential drilling difficulties.

The proposed northern site is located on ESP 1 in an area of CSP and ESP cross lines with sonobuoy data. No single channel, 3.5 kHz or 12 kHz profiles were presented, though *Farnella* GLORIA lines with each of these are available nearby. A similar situation exists for the northern site where the new *Farnella* seismics are considered better and where cores were taken in support of the Hawaii Flexure proposal. However, the southern site is now preferred by the Purdy group because of its good refraction data set and sheltered sea conditions.

[SSP held a closed session the on the second day to discuss and make recommendations on this proposal. See Section 6.1 of the minutes.]

2. Leg 137: East Pacific Neogene (Brenner)

Processing continues on the seismic reflection profiles collected during the WASHINGTON site survey. A sense of urgency is now in the air due to the fact that the leg has been moved up in the schedule. Brenner stated that because of this he had invited the co-chiefs (Mayer and Pisias) to Lamont for a meeting in August during which the data will be examined, the final sites selected and the safety package will be put together. Safety review will have to take place at the September PPSP meeting in order to avoid yet another PPSP meeting in calendar 1990.

3. Leg 138: Sedimented Ridges I & II (Louden)

The Sedimented Ridges sites were previously approved at the Hannover meeting. Still no information exists on the possibility of high resolution seismics for Escanaba Trough as previously recommended.

*ACTION ITEM 3: LOUDEN TO CONTACT EARL DAVIS FOR UPDATE OF RECENT SEDIMENTED RIDGES CRUISE RESULTS FROM SIDE-SCAN SURVEY AND ALVIN DIVES.

4. Leg 139: 504B or East Pacific Rise (Lewis)

There were no new developments expected or presented relating to 504B.

Lewis presented a summary of the East Pacific Rise DPG Report, along with new SSP matrices on the currently proposed sites (report and matrices included as Appendix H). The Chairman then welcomed Dan Fornari of LDGO, who gave a presentation on the various types of near-bottom data collected by JASON and ARGO during the Haymon/Fornari site survey cruise. Fornari fielded many questions from SSP members on the resolution capabilities of the various imaging techniques.

It was noted that the EPR DPG had concluded that the "carapace/rubble zone/ honeycomb" surface was indigenous and would likely pose drilling problems. A. Meyer commented that TAMU engineers were considering emplacing the guidebase with a "hammer-driving" action into this surface.

4. STATUS OF REMAINING CEPAC PROGRAMS (FY92 and beyond)

1. Atolls, Guyots & Aprons (Brenner)

The USSAC-funded site augmentation cruise for the Marshall Islands program is underway. The *Moana Wave* will collect another 9-10 days of data (6-channel watergun seismics, 3.5 kHz, dredges) on a cruise from Ponape to Honolulu. Duennebier will forward the data to the Data Bank for SSP examination at the next meeting.

There are no further developments in the Cretaceous guyots program. No information has been forthcoming on opportunities for obtaining sonobuoy data, as requested by SSP at its last meeting.

2. Bering Sea (Larsen)

No developments. The site UM-1 was approved by SSP at the last meeting. The Soviet data in the Shirshov Ridge area has not yet made an appearance.

3. Chile Triple Junction (Lewis)

Since the last SSP meeting in Menlo Park, the following data processing has been completed:

1) Two seismic reflection profiles (Line 734 and Line 750) have been depth migrated (MIGPACK software) at GEOMAR, Kiel. Six proposed drillsites are located on these lines. Continued processing of the CDP seismic reflection data will continue during the summer at HARC, also using the MIGPACK software.

2) Contoured gravity and magnetic field data have been merged with new shaded relief displays of SEABEAM bathymetry to clarify the relationships between the bathymetry and potential field measurements.

3) A PPSP preview of the CMTJ was conducted at the PPSP meeting in Iceland, June 1990. Following presentation of data, including a commercial well completion report from the region, PPSP had the following recommendations for the proponents:

A) The grid of dense single-channel seismic dip lines are probably adequate to delineate the three-dimensional structure surrounding drillsites if the sites cannot be moved to crossing CDP lines.

B) Drillsites might have to be moved to crossing CDP lines where such a move is compatible with reaching target horizons.

C) Proponents should not worry too much at this stage in the planning process about the locations of BSRs.

D) Proponents should get bottom water temperature measurements (perhaps from the Chilean Navy) for gas hydrate stability calculations, particularly in regions of shallow BSRs (approx. 800m water depths).

E) Proponents should display the seismic data at a large scale near the drillsites for the final safety review, rather than at the "regional" scale presented in Reykjavik.

F) Proponents should include the land geology in figures, and discuss the regional geologic history as determined from the land geology at the safety review. In particular, the issues of:
   Source
   Thermal History
   Migration Pathways
   Reservoirs
   Traps
   should be discussed on both regional and site-specific scales at the safety review.

G) Proponents should try to acquire rock samples from the outcrop belt of the Golfo de Penas Basin for TOC analysis, perhaps from Randy Forsythe or ENAP.

H) Proponents should present the commercial seismics from the Golfo de Penas Basin at the safety review.

Lewis was asked whether the new MCS processings and the PPSP preview had resulted in reconsideration of prime site locations. Lewis said that the sites were unchanged (see Appendix I for SSP matrices) and that the CTJ group was now awaiting PPSP's new guidelines on BSR penetrations.

SSP CONSENSUS: Preliminary CHILE TRIPLE JUNCTION site locations are unchanged after PPSP preview. Proponents should now respond to the specific data recommendations from PPSP, and should also provide the SCS watergun reflection profiles that image the BSR in regions where CDP processing tends to degrade BSR imaging.

4. Cascadia Margin (Louden):

The Cascadia Margin DPG is scheduled to meet in August for final selection of sites. Moore reported that for the Oregon margin, side-scan and multichannel seismic images have been coordinated to define surface expressions of faults. A. Meyer reported that heat flow measurements across BSR structures on the Oregon margin have been funded during an Alvin dive program scheduled for September.

Deep-tow side-scan has recently been collected on Vancouver margin.

SSP CONSENSUS: No further data gathering requirements are foreseen by SSP for the CASCADIA MARGINS. Final SSP approval will await "official" site selection and the presentation of the full data sets at our next meeting.

5. N. Pacific Neogene & Older (Larsen):

Site PM-1 (Patton Murray Seamount) was approved by SSP at the Hannover meeting.

Sites NW-1A, NW-3A and NW-4A were also approved by SSP at the last meeting; however, SSP recommends that other opportunities to collect better data should be investigated and pursued, if possible.

Detroit Seamount (DS-1C, DS-2A and DS-3A): Please note the sites were previously designated "DT." A paleoceanographic transect is the main objective, but basement samples may provide important information on the stability of the Hawaii hotspot from K/T boundary time.

Data from both the *Washington* and *Farnella* are now in the Data Bank, and Brenner has compiled a bathymetric map of the Detroit Seamount area with trackline overlays. A selection of appropriate seismic lines and revised site summary forms have been compiled by Larsen (see Appendix J for SSP matrices).

DS-1C. A new site has been selected on 3 crossing SCS lines from the *Washington* . The layers outcrop approximately 1 nm updip to the west in an erosional channel, so the structure is not closed. Basement is poorly imaged, but short range extrapolation indicates that the position is known within $\pm$ 50 m. The sediments are draped and pelagic. The data are sufficient from an SSP point of view.

DS-2A. This (new) site is positioned on crossing SCS lines. The data are sufficient as far as SSP is concerned.

DS-3A. This site is positioned on a *Farnella* SCS line. The seismic data are of low quality but are regarded as sufficient for this type of drilling, provided that good reflection data are collected by the RESOLUTION prior to drilling.

SSP CONSENSUS: The critical data for the NORTH PACIFIC NEOGENE program are in hand. The seismic reflection data are poor for a number of sites, but are still judged as sufficient for the drilling objectives as long as high-quality seismics are run by the drillship on arrival and departure from the sites.

6. E. Pacific Rise

(see item 3.4 above)

7. Sedimented Ridges II

(see item 3.3 above)

5. "NEW" CEPAC PROGRAMS; DATA PRESENTATIONS

1. Hess Deep: Layer 2/3 Transition and Layer 3 (Gillis)

The Chairman welcomed Kathy Gillis (WHOI) and Dave Caress and John Mutter (LDGO) to present data in support of the Hess Deep proposal.

Gillis outlined the Hess Deep regional geology and the main objectives of the drilling. The proposal is for a series of offset, multiple re-entry hard-rock guidebase holes in the Hess Deep region where Layer 2 & 3 rocks are shown to be exposed. Although the general tectonic setting seems reasonably well established, the detailed mechanism(s) which emplaced the crust in its present setting is subject to interpretation. The primary drilling objective is to recover lower crustal and upper mantle sections representative of a fast-spreading ridge. Processes of crustal assimilation, deformation and hydrothermalism as derived from sample recovery are also important objectives.

Presently-held survey data include:
Complete SeaBeam coverage (*Sonne* , *Atlantis* ,*Washington*)
2 dive series: 11 Alvin (Lonsdale) - 21 Nautile (Franchetau)
Magnetics (Searle & Franchetau)
Dredging (Lonsdale, Germans, Soviets)
Seismic Refraction (Soviets, Zonenshain [sp?])

Gillis noted that the sites in the preliminary proposal covering a section of EPR generated crust are now recognized as not viable for bare-rock drilling. Mutter was quizzed on whether the new sites were still priority 1 for LITHP in comparison with North Atlantic possibilities, given that the tectonic setting was now shown to be more complicated. Mutter's opinion was that they were.

Caress then outlined the LDGO proposal for a 35-day *Ewing* cruise to collect Hydrosweep, MCS, OBS, gravity and magnetics data in the Hess Deep area. Members

asked many questions relating to the potential of the various techniques in terms of resolving the two structural models (proposed by Lonsdale et al. and Franchetau et al).

Four sites (without priority) have been proposed for drilling. Although tectonic models for the Hess Deep are still controversial, the differences for shallow-to-intermediate crustal drilling are not large. The sites have been selected primarily on the basis of topography and samples recovered by submersibles. Geophysical data, other than multi-beam echo sounding, are generally lacking, although proposals are presently pending (Hildebrand/SIO, Caress/LDGO). See Appendix K for SSP matrix.

[SSP then held a closed session on this proposal with the proponents absent. See Section 6.2 of the minutes for SSP recommendations.]

2. Peru Gas Hydrates (Brenner/Ball):

The objective of this proposal is to drill through the base of a gas hydrate. In previous DSDP/ODP drilling there has been great reluctance to drill into these features for fear of releasing free gas trapped beneath the solid hydrate. Von Huene et.al. hope to penetrate the hydrate and: 1) quantify the parameters controlling hydrate formation; 2) chemically characterize the gas in the hydrate; and 3) evaluate different competing scenarios of methane and fluid sources. Geophysical objectives include measuring the effect of hydrate on thermal conductivity and evaluating the relationship between hydrate presence and seismic signature.

Brenner presented the data set for the proposal. Von Huene has been reprocessing two lines (1017 and 1018) collected by Shell Internationale, paying careful attention to preserving the relative amplitude and waveform characteristics as much as possible. Previous AGC processings (which included migration before stacking) tended to show the BSR as a continuous feature. The "true amplitude" processings, on the other hand, show rather extensive lateral variation in the BSR.

The first site (GH-1) is to be drilled on Line 1018 at a point corresponding to Site 688 (located on line CDP-1 of the Nazca Plate Project). The subsequent sites will be located based on calibrated measurements of hydrate and free-gas, but will be structurally higher.

Ball outlined present PPSP thinking in terms of the viability of drilling BSR's. This results from Claypool et al.'s re-assessment that critical accumulations of gas under BSR's might be relatively rare and in any case detectable as enhanced reflectors on well-processed MCS lines.

Brenner then summarized the data set in the area of the Peru margin. The Shell lines with true amplitude processing are of superior quality. The proposed sites are also located within the net of MCS lines collected by the *Moana Wave* site survey prior to Leg 112. SeaMARC II and 3.5 kHz data were also collected during these surveys. Line CDP-1 provides additional control, as does ODP Site 688, located approximately 1 km away. SSP matrices are included as Appendix L.

[See Section 6.3 for SSP recommendations concerning this proposal.]

6. DISCUSSION AND RECOMMENDATIONS ON PRESENTATIONS

1. OSN Hole, Oahu

SSP noted with dismay the fact that the data in support of this proposal has not yet been synthesized by the proponents. It was agreed that Brenner and Collins could draw together the necessary data by September and that an SSP member should review the package on behalf of the Panel. U.S. East Coast SSP members were unable to undertake this, so Canadian member Louden was asked to visit LDGO in early September for this purpose. If this becomes impossible, the Chairman will arrange a visit from the U.K.

SSP CONSENSUS: The necessary data for the siting of the OSN PILOT HOLE (at either of the two proposed locations) probably exists. Full site survey data packages must be available for review by SSP and PPSP in September.

*ACTION ITEM 4: BRENNER WILL MEET WITH COLLINS TO BRING TOGETHER THE TWO OAHU DATA PACKAGES BY EARLY SEPTEMBER. LOUDEN WILL VISIT THE SITE SURVEY DATA BANK TO UNDERTAKE A FINAL SSP REVIEW PRIOR TO THE SCHEDULED MID-SEPTEMBER PPSP MEETING.

2. Hess Deep

There was considerable discussion over whether or not the drilling results could be properly interpreted without a coordinated seismic reflection survey.

SSP CONSENSUS: Additional geophysical data, primarily detailed seismics to better characterize crustal structure and possible existence of rubble, are needed to assure drilling objectives in the HESS DEEP. Most

of these requirements would be met if the Caress, et. al. proposal is funded. Although 2 MCS lines are proposed, the panel feels that at least 4 lines are needed (2 ea. orthogonal and 2 ea. parallel to the spreading axis) to establish whether the sections drilled are typical of the area. Deep-towed side-scan sonar is also needed to determine continuity of surface fabrics and to tie into MCS lines. SSP recommends that any transponder beacons deployed during upcoming cruises be left to aid site location for the drillship. The panel is concerned about the time needed to acquire and assimilate the required survey data, and believes that drilling should not be scheduled before late 1992.

3. Peru Gas Hydrates

SSP CONSENSUS: SSP concludes that the data set for the PERU GAS HYDRATES proposal is more than adequate for drilling. The Panel recognizes the importance of this proposal, not only for what can be learned from this specific area, but for its impact on future drilling in areas marked by the presence of BSRs.

7. ASSIGNMENT OF ATLANTIC PROGRAMS TO SSP "WATCHDOGS"

The Panel began with a discussion of its approach to watchdog assignments where members of the Panel were named proponents or might be involved in proposals to conduct future site surveys. SSP agreed that the latter conflict of interest must always be avoided. For the former case, unless the member is a senior author on a proposal, there are significant advantages to the Panel in having a member perform the watchdog role. Data oversight is significantly enhanced (e.g., Lewis on Chile Triple Junction and its presentation for PPSP preview). Members must always declare an interest when presenting to SSP and the Panel should take great care in preserving its role as an *independent* advisor to proponents and PCOM.

SSP CONSENSUS: SSP members may serve as "SSP watchdogs" on proposals for which they are "minor" proponents, but not for proposals in which they may be seeking funds for future survey activity.

Kidd noted that 23 proposals were to be shared between 10 panel members. Some proposals are probably large enough to take the full effort of one member, while others are small enough at present to be handled along with 2 and 3 other proposals. Two new members- Trehu and an oil industry representative- are expected to join us after the next meeting and could be available for any new proposals coming our way from thematic panels via PCOM. DPG's are charged with grouping some of these

proposals and so the workload will change and will almost certainly necessitate changes in "watchdog" assignments.

SSP, after considerable discussion, made the following watchdog assignments:

		SSP Watchdog (* = "minor" proponent)
1. Barbados Accretionary Wedge		
378/A Rev.: 342/A	Growth Mechanics and Fluids Evolution of the Barbados Accretionary Wedge	Moore
2. Cayman Trough		
333/A:	Tectonic and Magmatic Evolution of Pull-apart Basin: a Drilling Transect Across the Cayman Trough, Caribbean Sea	Lewis
3. Equatorial Atlantic Transform Margins		
313/A:	Evolution of a Major Oceanographic Pathway: the Equatorial Atlantic.	Pautot
346/A Rev.	A Proposal for Scientific Drilling on the Equatorial Atlantic Transform Margin.	Pautot
4. MARK area: long section of upper mantle		
369/A:	A Deep Mantle Section in the MARK Area: a Preliminary Proposal for the Ocean Drilling Program.	Hirata
5. Mediterranean Gateways		
323/A:	Neogene Evolution of Continental Basement Overthrusting and Extension in the Alboran Sea and the Development of the Atlantic-Mediterranean Gateway.	Kastens
372/A:	Cenozoic Evolution of Intermediate Water Circulation and of Vertical Chemical Gradients in the North Atlantic.	Larsen

6. New Jersey Margin Sealevel

348/A:	Upper Paleogene to Neogene sequence stratigraphy: the Ice House world and the U.S. Middle Atlantic Margin.	Kastens

7. North Atlantic: Non-volcanic Rifted Margins

334/A:	The Galicia Margin New Challenge: Drilling Through Detachment Faults Lower Crust and Crust-Mantle Boundary.	Kidd
365/A:	Conjugate Passive Margin Drilling - North Atlantic Ocean.	Louden*
366/A:	Labrador-Greenland (Preliminary Proposal)	Lewis

8. North Atlantic: Volcanic Rifted Margins

310/A:	Preliminary Proposal for ODP Drilling in the NE Atlantic: Geochemical Sampling of Dipping Reflector Sequences.	Kidd*
311/A:	The "Sedimentary Equivalent" of Dipping Reflector Sequences.	Kidd*
328/A:	Proposal for ODP Drilling on the Continental Margin of East Greenland, North Atlantic.	Meyer*
358/A:	Formation of Volcanic Rifted Passive Continental Margins: Proposal for a Drilling Transect at the Voring Margin.	Meyer
363/A:	Plume Volcanism during the late Rift to Early Drift Phase of Grand Banks - Iberia Separation.	Lewis

9. Northernmost Atlantic Paleoceanography: Arctic Gateway

305/F:	Proposal for Arctic Ocean Drilling	Larsen
336/A:	Arctic to North Atlantic Gateways, Oceanic Circulation and Northern Hemisphere Cooling.	Larsen

320/A:	ODP Drilling in the Nordic Seas (the Arctic Ocean - the Norwegian/Greenland/Iceland Sea-the NW Atlantic Ocean System), Addressing High Northern Latitude Paleoceanography and Paleoclimatology.	Larsen

10. TAG Area: High-temperature Hydrothermalism

361/A:	A Proposal for Drilling an Active Hydro-thermal System on a Ílow-Spreading Ridge: Mid-Atlantic Ridge, 26 N (Tag Area)	von Herzen

11. Vema FZ: Layer 2/3 Transition

376/A:	Drilling the Layer 2-Layer 3 Boundary (and the Crust Mantle Boundary) on the Southern Wall of the Vema Fracture Zone.	Hirata

12. Vema FZ: Layer 3 - Mantle Transition

376/A:	Drilling the Layer 2-Layer 3 Boundary (and the Crust Mantle Boundary) on the Southern Wall of the Vema Fracture Zone.	Hirata

13. West Florida Margin Sea Level

345/A:	Drilling Proposal for the West Florida Continental Margin, Gulf of Mexico: Sea Level and Paleoclimatic history.	Moore

The relationship of the assigned watchdogs to the newly-formed DPG's had already been discussed and is referred to in a previous SSP Consensus and in Action Item 2. Chairman Kidd will offer four names- Kidd, Louden, Lewis, and H. Meyer- as liaisons for the North Atlantic Rifted Margins DPG, and will nominate Larsen as liaison to the Arctic Gateways DPG. Moore and Kastens will be put forth as liaisons to the Sea Level Working Group. If PCOM agrees in principle to the liaisons but does not choose between the names, SSP will make its own assignments on a meeting-by-meeting basis, keeping in mind its additional recommendation concerning the Data Bank Manager's attendance at such meetings.

8. NEXT MEETING & MISCELLANEOUS ITEMS

The anticipated business of the next SSP meeting was discussed. Principal will be the final assessments of individual CEPAC sites (Cascadia Margins; Chile Triple Junction; Atolls, Guyots and Aprons) along with initial watchdog presentations on the North Atlantic proposals. It was agreed that a 3-day meeting was required and that the dates were not as constrained as usual by the need to come after the thematic panel meetings and before PCOM. The provisional dates to be recommended to the JOIDES Office are 12-14 March.

It was recognized that SSP was next due to meet in a non-US locale and that Japan was next in order as non-US host. Hirata agreed to investigate accommodations at ORI for mid-March.

*ACTION ITEM 5: HIRATA TO INVESTIGATE ARRANGEMENTS FOR HOSTING THE NEXT SSP MEETING IN TOKYO. KIDD TO WRITE TO PCOM CHAIRMAN MOBERLY NOTIFYING HIM OF REQUESTED LOCALE AND PROVISIONAL DATES OF 12-14 MARCH.

Chairman Kidd thanked Laurent d'Ozouville on behalf of SSP for his sterling service as liaison to the Panel. He commented that no other JOIDES Office liaison in his experience had implemented so many changes that were specifically beneficial to SSP's interests. These changes had been instituted against a background of panel structure changes that had clearly made SSP's work more difficult, and the Panel was most appreciative of his efforts.

The Chairman also extended his thanks to all of the presenters for their contributions to the meeting, and to Carl Brenner for his efforts as host.

The meeting adjourned at 1600 on 13 July, leaving Kidd and Brenner to cope with the daunting task of compiling the minutes.

"It was a nice meeting, but what exactly did we decide?"

EXECUTIVE SUMMARY: STRATEGY COMMITTEE

ad hoc subcommittee of JOIDES PLANNING COMMITTEE
Joint Oceanographic Institutions, Inc.
Washington, D.C.
29 May 1990

As decided upon by PCOM during its Paris meeting, the purpose of the inaugural meeting of the STRATCOM subcommittee was two-fold:

1.) To facilitate renewal of ODP:

- by examining and implementing ways to showcase and enhance the program's effectiveness, both within the U.S. and among the international partners.
- by presenting such strategies to PCOM at its August, 1990 meeting.
- by reporting on STRATCOM existence and its initial deliberations to EXCOM during its joint meeting with the ODP COUNCIL in June, 1990, with a view to enlisting its active support in the renewal effort.

2.) To examine various means of showcasing ODP's accomplishments to a growing number of detractors, as evidenced by recent correspondence to the JOIDES Office (see PCOM Agenda Book, Paris Meeting, 4/90).

STRATCOM was also to recommend to PCOM at its August meeting whether or not a continuing mandate for its existence was warranted.

Identification of Themes to Serve a Focused Drilling Program

Discussion culminated in a recommendation to PCOM for consideration of the following themes for a focused approach to ocean drilling (no priority order):

- **HIGH-RESOLUTION NEOGENE PALEOCEANOGRAPHY TRANSECTS**
- **SEA-LEVEL STUDIES**
- **DEEP-DRILLING TO UNDERSTAND THE STRUCTURE AND FLUID DYNAMICS OF ACCRETIONARY PRISMS**
- **PASSIVE MARGIN EVOLUTION**
- **EVOLUTION OF SEDIMENTED AND UNSEDIMENTED RIDGE CRESTS**
- **OFFSET DRILLING FOR DEEP LITHOSPHERE OBJECTIVES**

Publicity/"Dog and Pony Shows"

Discussion resulted in a recommendation to JOI, Inc. to hold a presentation similar to its well-received National Science Board program (perhaps in modified form) before the combined EXCOM/ODP COUNCIL at its 20-21 June meeting in Washington, D.C., with a view to soliciting EXCOM response concerning subsequent scheduling and formatting of such events in member countries.

Maximizing Impact of the Long Range Plan

Given ODP's existing liaisons with FDSN and GSGP, and probable future liaisons with InterRIDGE, Nansen Arctic Drilling Program, IGBP and

JGOFS, STRATCOM will formulate a series of one-page summaries of ODP's existing and newly evolving relationships with a number of important global initiatives in the earth sciences.

Those initiatives are listed, along with suggested authors (no priority order):

- GLOBAL CHANGE (B. Ruddiman/N. Pisias)
- TECHNOLOGY DEVELOPMENT (C. Sparks/B. Harding)
- GLOBAL SEDIMENTARY PROCESSES (M. Arthur)
- RIDGE CREST PROCESSES (J. Malpas/B. Detrick)
- HIGH-LATITUDE DRILLING (G. Brass/L. Johnson)
- CONTINENTAL DRILLING (T. Pyle)

The written summaries will be included with the JOI, Inc. brochure, intended as a popular summary to accompany publication of the LRP.

Other Recommendations

For PCOM

In light of the themes listed above (while stressing that they are a flexible framework, into which modified/new themes could be incorporated), STRATCOM suggests to PCOM that it charge the thematic panels to go beyond existing, unsolicited proposals and Detailed Planning Group drilling plans to synthesize a prospectus involving a finite number of long-term focuses of ODP, each perhaps consisting of 4-6 drilling legs. The following questions must be addressed:

- **How will such programs be tackled effectively?**
- **Who will the proponents of these programs be?**
- **Do the proposals exist to tackle these programs effectively? If not, how will these proposals be generated?**

STRATCOM felt that such a strategy could perhaps be in place for the advisory structure before November 1991.

STRATCOM considers that its *ad hoc* status as an executive subcommittee of PCOM is appropriate and should be retained.

For JOI, Inc.

Consider augmenting the number of LRP/brochure packets to be published (currently ~2,500) to include more mailings to international partners (now set at ~200 each) and perhaps to more/other U.S. organizations.

For National Science Foundation

Approach the Ocean Studies Board of the National Academy of Sciences (and perhaps other, similar review bodies as deemed appropriate) for a formal review of the LRP.

STRATCOM felt that such an initiative would blunt unofficial criticism of ODP, while encouraging official, and perhaps constructive, suggestions for program improvement over the long term.

MINUTES

STRATEGY COMMITTEE
ad hoc subcommittee of JOIDES PLANNING COMMITTEE

Joint Oceanographic Institutions, Inc.
Washington, D.C.
29 May 1990

MEMBERS: Dr. James Austin, PCOM, chairman
Dr. Ralph Moberly, PCOM
Dr. Margaret Leinen, PCOM
Dr. John Malpas, PCOM
Dr. Nicklas Pisias (primary author of the ODP Long Range Plan)
Dr. Thomas Pyle, JOI, Inc.
(a senior member of the West German scientific hierarchy tentatively scheduled to attend did not)

GUEST: Dr. James Baker, JOI, Inc.

Introduction

As decided upon by PCOM during its Paris meeting, the purpose of the inaugural meeting of the STRATCOM subcommittee was two-fold:

1.) To facilitate renewal of ODP:

- by examining and implementing ways to showcase and enhance the program's effectiveness, both within the U.S. and among the international partners.
- by presenting such strategies to PCOM at its August, 1990 meeting.
- by reporting on STRATCOM existence and its initial deliberations to EXCOM during its joint meeting with the ODP COUNCIL in June, 1990, with a view to enlisting its active support in the renewal effort.

2.) To examine various means of showcasing ODP's accomplishments to a growing number of detractors, as evidenced by recent correspondence to the JOIDES Office (see PCOM Agenda Book, Paris Meeting, 4/90).

STRATCOM was also to recommend to PCOM at its August meeting whether or not a continuing mandate for its existence was warranted.

General Discussion

In advance of the meeting, correspondence had circulated between Austin and Moberly concerning possible agenda items. All members and Tom Pyle received copies, and that correspondence is included (see Appendix A).

Given the ad hoc status of STRATCOM, initial discussion focused on the role ODP does and should continue to play vis-a-vis other "big science" initiatives.

Moberly set the tone by stating that ODP's primary function, over the next few years, ought to be to satisfy the interests of thematic panels, the U.S., and the international

partners. Baker contributed that the program should address the needs of the professional earth sciences community first.

Malpas described the present situation in Canada, where competition among existing earth science programs is intense. Of the four major initiatives currently being developed internally: ODP, LITHOPROBE, continental drilling and global change (which in Canada means study only of the last 10K years of earth history), only ODP and LITHOPROBE are now being financially supported. Only two of these four will be supported in the future as well. To continue to attract support, ODP must liaise with other programs and offer "lollipops" to the international partners in the form of both thematic and regional ocean drilling initiatives of particular interest to them.

Most important, Malpas felt that ODP must make a major commitment to one (or more) of the tenets that got it funded originally: high latitudes, "natural laboratories", and deep drilling. In other words, STRATCOM should rally the PCOM to "bite the bullet", i.e., commit to a few programs and do them properly.

Pisias felt that the Long Range Plan (LRP) has been written to illustrate a phased approach to problem-solving with the drill, and emphasized that ODP is not yet ready to do some things, e.g., deep drilling.

Pyle evinced some sympathy for a "high risk-high return" drilling program, perhaps once a year. Austin and Leinen responded that such science must still have the scrutiny and endorsement of the thematic panels prior to its inclusion in the drilling schedule.

Identification of Themes to Serve a Focused Drilling Program

Discussion continued concerning possible strategies for implementing a more focused approach. The following were discussed:

- ask each of the international partners to name their scientific priorities, while soliciting learned bodies within the U.S. (perhaps the National Academy of Sciences) to do the same.
- modify the existing program to rely less on unsolicited proposals, and more on thematic panel/working group/detailed planning group syntheses (perhaps of unsolicited proposals, at least in part) addressing important themes emphasized in the LRP. PCOM could then take such input to establish a finite number of programs to receive intensive drilling effort.

The overriding perception of STRATCOM was that the thematic panels should still do much of the work, given guidance from the PCOM (with specific reference to the April PCOM motion concerning the 1990-1993 four-year plan for concentration of drilling in the Pacific and the Atlantic north of the equator) and with cognizance of the thrusts of other international science initiatives.

- perhaps the November 1990 Annual PCOM Meeting with Panel Chairmen should be the time to get this process started, after a general discussion within PCOM in August.

A long discussion followed during which STRATCOM considered themes which might be appropriate for a focused effort, but without regard to a regional (e.g., Pacific) emphasis. First, the scientific objectives listed for Phase I of the LRP were discussed in detail (see p. 103, LRP): "Given the present level of technology and the present status of planning, the following themes will be part of the main focus of ODP: high-resolution Neogene

paleoceanographic transects, sea-level studies, 1.0-1.5 km deep holes on accretionary wedges, plate kinematic studies, deep holes at fast-spreading, unsedimented ridge crests and intermediate-spreading, sedimented ridge crests, and coordination of Arctic drilling efforts." Then, STRATCOM considered themes highlighted as objectives of the existing body of unsolicited proposals from all oceans ranked highly by the thematic panels. STRATCOM recognized that both groups of themes were generally similar, particularly when LRP phase I themes were modified [as above] to include drilling activity in any ocean.

The discussion culminated in a recommendation to PCOM for consideration of the following themes for a focused approach to ocean drilling (no priority order):

- **HIGH-RESOLUTION NEOGENE PALEOCEANOGRAPHY TRANSECTS**
- **SEA-LEVEL STUDIES**
- **DEEP-DRILLING TO UNDERSTAND THE STRUCTURE AND FLUID DYNAMICS OF ACCRETIONARY PRISMS**
- **PASSIVE MARGIN EVOLUTION**
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- **OFFSET DRILLING FOR DEEP LITHOSPHERE OBJECTIVES**

STRATCOM considered whether the paleoceanography theme was broad enough to satisfy the community's known temporal and latitudinal interests, and concluded that this theme might need to be discussed further within PCOM, perhaps to include Mesozoic and high-latitude aspects.

Publicity/"Dog and Pony Shows"

STRATCOM then turned its attention to the complex issue of generating positive publicity for ODP prior to and during the renewal period (1990-1992).

The committee was aware of EXCOM's stated intent to have each international partner organize its own publicity campaign, perhaps coordinated by JOI, Inc., and that letters expressing JOI's willingness to coordinate such efforts had already been sent to EXCOM members by Baker (for an example, see Appendix B). PCOM had also heard in April about JOI's well-received mid-March presentation about ODP to the National Science Board.

Malpas informed STRATCOM that each international partner will have its own timeline for renewal. (The Canada /Australia [CAN/AUS] timeline can be found on p. 7 of the January, 1990, issue of *The Resolution Report*, the newsletter of the Canadian Secretariat of ODP.) He detailed CAN/AUS plans for generating renewal enthusiasm, including 1.) a conference on ocean drilling during the Townsville, Australia port-call of the *Resolution* (October, 1990), with invited politicians from the U.S. as well as Canada and Australia, 2.) a 1.5-day meeting on global change during the Victoria, B.C. port-call (July, 1991), and 3.) a possible international session of ODP during the PACRIM meeting in Bangkok, Thailand (October, 1991). Such a meeting might include highlights of the Victoria meeting, perhaps special sessions on technology, and invited science presentations. He suggested that a JOI-coordinated "dog-and-pony show" for CAN/AUS might need to precede the Victoria meeting by 6 months-1 year.

Further discussion resulted in a recommendation to JOI, Inc. to hold another such presentation (perhaps in modified form) before the combined EXCOM/ODP COUNCIL at its 20-21 June meeting in Washington, D.C., with a view to soliciting EXCOM response concerning subsequent scheduling and formatting of such events in member countries.

Maximizing Impact of the Long Range Plan

Discussion centered on ways to maximize the impact of the LRP for scientific audiences of various interests. STRATCOM formulated one action plan, as follows:

Given ODP's existing liaisons with FDSN and GSGP, and probable future liaisons with InterRIDGE, Nansen Arctic Drilling Program, IGBP and JGOFS, STRATCOM will formulate a series of one-page summaries of ODP's existing and newly evolving relationships with a number of important global initiatives in the earth sciences.

Those initiatives are listed, along with suggested authors (no priority order):

- GLOBAL CHANGE (B. Ruddiman/N. Pisias)
- TECHNOLOGY DEVELOPMENT (C. Sparks/B. Harding)
- GLOBAL SEDIMENTARY PROCESSES (M. Arthur)
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- HIGH-LATITUDE DRILLING (G. Brass/L. Johnson)
- CONTINENTAL DRILLING (T. Pyle)

The written summaries will be included with the JOI, Inc. brochure, intended as a popular summary to accompany publication of the LRP.

Austin volunteered to solicit these write-ups, edit/reformat them, and if necessary get outside review in time to meet JOI, Inc.'s publication schedule (~July, 1990).

Other Recommendations

For PCOM

In light of the themes listed above (while stressing that they are a flexible framework, into which modified/new themes could be incorporated), STRATCOM suggests to PCOM that it charge the thematic panels to go beyond existing, unsolicited proposals and Detailed Planning Group drilling plans to synthesize a prospectus involving a finite number of long-term focuses of ODP, each perhaps consisting of 4-6 drilling legs. The following questions must be addressed:

- **How will such programs be tackled effectively?**
- **Who will the proponents of these programs be?**
- **Do the proposals exist to tackle these programs effectively? If not, how will these proposals be generated?**

STRATCOM felt that each thematic panel could perhaps generate such a prospectus once a year, for incorporation into the following fiscal year's program plan at the Annual PCOM Meeting with Panel Chairmen each November. Although the November 1990 meeting was probably too early to ask for such syntheses, the group felt that such a strategy could perhaps be in place for the advisory structure before November 1991.

STRATCOM considers that its *ad hoc* status as an executive subcommittee of PCOM is appropriate and should be retained.

Formalizing its identity would require EXCOM approval, which STRATCOM felt to be undesirable, at least for the moment.

Malpas felt that enthusiasm should guide participation in STRATCOM, and he said that he would endeavor to continue to speak on behalf of the other international partners.

For JOI, Inc.

Consider augmenting the number of LRP/brochure packets to be published (currently ~2,500) to include more mailings to international partners (now set at ~200 each) and perhaps to more/other U.S. organizations.

Austin suggested targeting high school districts as well as college geoscience departments, in order to bring knowledge of ODP to prospective undergraduate as well as graduate students in earth science.

Pyle acknowledged that JOI, Inc., in addition to generating the brochure to accompany the LRP, had approached Thomas Horton Associates concerning a film incorporating ODP footage for possible airing on the Arts and Entertainment network, as well as for National Geographic Explorer. He suggested that this might be enough for the time being, given the difficulty and costs of generating "popular" science literature.

For National Science Foundation

Approach the Ocean Studies Board of the National Academy of Sciences (and perhaps other, similar review bodies as deemed appropriate) for a formal review of the LRP.

STRATCOM felt that such an initiative would blunt unofficial criticism of ODP, while encouraging official, and perhaps constructive, suggestions for program improvement over the long term.

Future Meeting Schedule

STRATCOM decided that Austin/Moberly could speak on its behalf during the upcoming meeting of EXCOM/ODP COUNCIL, and therefore that a meeting of the full committee at that time would be unnecessary. Whether or not further meetings of the committee are warranted will await general PCOM discussion in August.

Conclusion of the Meeting

The inaugural meeting of STRATCOM adjourned at 4:30 PM.

INSTITUTE FOR GEOPHYSICS
THE UNIVERSITY OF TEXAS AT AUSTIN

8701 Mopac Boulevard · Austin, Texas 78759-8345 · (512) 471-6156 · Telex: 910-874-1380 UTIG AUS

Memorandum

15 May 1990

From: Jamie Austin

To: Ralph Moberly

Re: Response to your 5/7/90 strawman agenda, strategy meeting

Please forgive my delay in responding to you. You may not have intended that we give you written responses prior to the 29 May meeting, but in my opinion several of your points merit an open discussion at this time.

I discussed your memo with Art Maxwell, and I will let you know how Art sees things at appropriate points in this discussion. I will take each of your points in turn.

Ways to improve the chances of program renewal

1. I completely agree that the international aspect of ODP has been and continues to be one of its strongest points. That is emphasized in the LRP, and I feel that we cannot say it strongly or often enough.

   - Art has informed me that real progress is being made on admission of the Soviet Union. I'm sure that you have gotten information from either Chuck or Barry, but the implication is that a decision may be made prior to the EXCOM meeting in June.

   - Art (and other EXCOM members) received a letter from Jim Baker suggesting that JOI coordinate "road shows" both within the U.S. and abroad. (You have seen the copy of the letter sent to Jim Briden.) I enclose a copy of Art's response, both endorsing the general idea and suggesting that such a show be made to EXCOM/ODP Council in June. I concur with Art's suggestion.

   - As part of the "road show" effort, PCOM could encourage JOI to solicit any and all co-chiefs (particularly US, but perhaps inviting foreign co-chiefs as well) to participate in these efforts. Frankly, I feel that this should be made part of a co-chief's post-cruise responsibilities on a more formal level, but perhaps we could discuss this at the strategy meeting.

2. I do not consider the next EXCOM/ODP Council meeting an inappropriate forum for an intense and wide-ranging discussion of renewal. Why do you see this discussion as having a possibly negative tone? The ODP Council is exactly the group that needs to be convinced that ODP must survive through the 1990's! If you (we) cannot convince this group that ODP is a viable, exciting effort, then we certainly will not be able to convince real antagonists. Maxwell absolutely agrees with my point of view. He feels that delaying these discussions until the October EXCOM may be like closing the barn door after the stock has left!

3./4. I do not feel that excitement needs to be "'manipulated'" into ODP as it is presently configured. After a long, arduous process of self-examination, the advisory structure has been reconstituted for a thematic approach. The themes are exciting! All we have to do is publicize them, and fully document ODP's contributions in addressing them!

- I am staunchly against periodically ignoring thematic panel input to schedule "headliner" programs that are not mature. Art echoes this sentiment. In my opinion, PCOM would not have scheduled the Oahu test hole unless it had been highly ranked by both LITHP and TECP. If we cannot continue to sell ODP successfully in competition with other programs based upon the proposals that are written for it and reviewed through the panel structure, it is certainly time for ocean drilling to stop.

- Frankly, if we were to adopt this approach, we are already too late, at least to mount a "pizzazz" effort for 1993 renewal. We are already firmly scheduled throughout much of the period when MOU's will be negotiated and signed!

- I have no objection to PR work on the programs that we do drill. Perhaps we could think about hiring a publicist, or even a PR firm, to accomplish this task. (Unfortunately, none of us is qualified to replace Walter Sullivan.) Perhaps JOI could help, at least in the U.S. How about on the international scene?

5. I am all for generating excitement about new technology, but I'm not sure how best to accomplish it. I agree that we should not build up too much publicity about "new" systems like the DCS until we have a feeling about whether or not they will work, but we must get out as much information as possible to proponents or they will give up on the program's technical capabilities and stop writing ODP proposals!

6. Direct involvement is one approach, and I certainly think that the upcoming Oahu leg is an opportunity for such involvement which is not to be missed. Art concurs, particularly in regard to ship visits while the vessel is in port. (He is not as enthusiastic about letting the Walter Sullivans of the world go to sea. He may be afraid that they will get seasick or die on the rig floor, but I sailed with Sullivan once and he had a great time.)

- How about video/movies/NOVA/DISCOVERY? TV is everyone's best friend but ODP's. I think we should explore real-time reporting from the ship, a la Ballard. It would not need to happen on every leg, but why couldn't we could have the equipment aboard and generate some relationship with PBS/some other network for periodic broadcasts from the Resolution? In an era when science education is being spotlighted, particularly in the U.S., why not draw students into the game?

7. By all means, let's emphasize what we do right.

- The program has changed for the better recently - improved liaisons with other international programs (kudos to Tom Pyle), new emphasis on thematic planning,

increasing awareness on the part of PCOM that it must to the extent it can follow its own panel structure's advice...

- All of which has happened without sacrificing the program's responsibility to be responsive to: outside proposals and incredible diversity of opinion.

- The bottom line is that ODP should not , cannot, and need not stand on its impressive laurels. The program has (for decades) and can still fire the imagination of us all. But we (the natural sciences community) have to want that to happen.

- Therefore, I believe our response should be measured, but enthusiastic: letter writing to specific detractors, particularly if in their apparent ignorance they are in a position to do us harm (e.g., Coleman), formal review of documents generated within the program (e.g., Ocean Studies Board review and comment on the LRP, something John Sclater, as OSB chairman, has already agreed to do), and flexibility (to adapt to the changing ideas of proponents, to adopt new technology, and if necessary to embrace other initiatives which have historically been or are currently being viewed as competitive with ODP [e.g., NEREIS]).

Well, Ralph, this document is hardly an agenda, but it certainly is a point of view. If we need an agenda for the meeting, should we wait until everyone on the committee has been able to get something like this out? I look forward to further discussions.

Distribution: M. Leinen
J. Malpas
N. Pisias
A. Maxwell

cc: T. Pyle
E. Kappel

140 JOIDES Planning Office
Hawaii Institute of Geophysics
School of Ocean and Earth Science and Technology
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822 USA

Telephone: (808) 956-7939
Telemail: JOIDES.HIG
Telex: 7407498/JOID UC
(OMNET Service)
FAX: (808) 956-2538

7 May 1990

Memo To: Members of JOIDES ad hoc Strategy Committee

From: Ralph Moberly

Re: Some points to be discussed at strategy meeting

Here are some comments to get us started in our 29 May meeting. Perhaps all of us should arrive with such a list. Many of these points were developed in a 3 May 1990 discussion session with Barry Raleigh & Chuck Helsley, although these summary comments to assist the Strategy Committee are mine.

Ways to improve the chances of program renewal

1. The international aspect of the program is the glue that will hold it together, even if some sectors of the community object during the science review in the US.

- If all (or even all but one) of the present partners opt for renewal, NSF almost certainly will follow.

- We must do all we can to keep it international. Other factors being equal, special attention should go to addressing the concerns raised by the international partners. Some of the international concerns expressed included:
  - opportunities for drilling in any ocean (Satisfied?)
  - looking towards new technology (Is that OK within budgetary limitations for DCS, other engineering, and logging? Is Deep-drilling Working Group the next appropriate step?
  - Does new technology also mean new vessels? i.e., the French, Japanese and Russian possibilities, and a post-Resolution deeper-drilling platform; if so, what are the implications for renewal with these added costs in $, international interest, and available scientist-time?)
  - ties to new global initiatives (how does enthusiasm of non-US members of PCOM match with general caution of non-US members of EXCOM? Be careful of distinction between international and US-only initiatives).

- Should the team that performed before the NSB put on a road show?

- Any last-minute non-US problems with the Long Range Plan? Can we help with the local brochures to help to de-fuse objections with the LRP held by non-US partners?

2. The next EXCOM meeting (late June) is not the appropriate place to bring up negative or controversial topics.

• Too many ministers-bankers will be present because ODP Council meets at same time. There should be neither a printed agenda item nor open discussion.

• Emphasis there should be positive: on scientific achievements and engineering advancements, and 4-year direction of vessel.

• Maybe part or all of the presentation for the National Science Board should be repeated at the meeting.

• Discussion of negative issues might, however, start in JOI Board meeting on Friday.

• The October EXCOM meeting is a good time to raise a general discussion of real and potential problems with renewal.

3. Excitement must be "manipulated" into the program, to generate publicity, and then the publicity must be driven to the hilt.

• Manipulation should follow several directions - in the program plan (selection and order of drilling legs), in engineering and tool development, in ties to other global initiatives, in publicity aboard the drilling vessel.

• Manipulation must follow a schedule to have maximum impact.

• A year of potential "headliners" should be tied to renewal time:
- find out the optimum window when favorable and enthusiastic publicity will affect renewal favorably by impressing a broad range of the geologic and non-geologic scientific community and the general public, both US and non-US.
- orchestrate or manipulate the drilling schedule for that window, with the aim of scheduling not necessarily the highest-ranked thematic programs, but rather a succession peaking to ones that best combine potential pizzazz headlines with good science and an excellent chance for "success".
- perhaps tweak or adjust the sites, objectives, and leg length to emphasize the potential for zip and zing.
- Here are some examples from thematically-ranked programs most familiar to me; each of the other members of this ad hoc committee must know others:

☛ (Hess Deep) ***Moho Reached!*** ODP attains major scientific objective first proposed in 1960s!! Identification in place of material of the earth's "inner space"!!! How did the crust of the earth form??? (and back-up articles ✍ of analogy of length of time (1946 to present) to develop and deploy Hubble Space Telescope to penetrate "outer space"; of the trials and tribulations of the management and costs (brought forward in constant dollars) of Mohole Project, in contrast to ODP; of ideas about the interior of the earth, meteorite analogies, origin of earthquakes and volcanoes, and all of that good stuff. Play up the persistence of scientists to obtain and use facilities to solve first-order scientific puzzles.) Incidentally, Hess Deep can go with regular drilling and full suite of logs; doesn't depend on DCS.

☛ (Atolls & Guyots) ***Darwin's theory confirmed!*** Ancient Pacific site of immense volcanism!! Wide-spread drowning of ancient reefs!!! Why did some reefs die and some live??? (background articles ✍ on Darwin's writings and good reputation before Origin of Species; on discovery of guyots by scientist in Navy during World War II and on atoll drilling in post-war era. Interviews with biologists on fragility of reef

systems; with paleoceanographers on Cretaceous as time of extensive greenhouse conditions; with paleontologists on extinctions, etc. Play up the interrelationships in the natural sciences).

☛ (Sedimented Ridges) ***Ocean drillers penetrate growing ore body!*** Technological advances allow scientists to sample and measure characteristics of an active mineral deposit!! Host sediments and conditions of origin defined!!! Where can ore bodies be found??? (and interviews ✍ with "friendly" mining company geologists and government geologists on value in predicting deposits on land; interviews with government officials about EEZ, about need for metals and other raw materials in our overpopulated world. Articles on the necessary drilling, fluid-sampling, and logging advances, with appropriate thanks to countries and companies that provided expertise and equipment; on the need for additional marine geophysics, sampling, etc to map EEZ and rest of sea floor. Play up the relationship between technological advances and resources.)

☛ (Loihi) ***Submarine volcano probed!*** Newest active Hawaiian volcano prepared for monitoring!! Cored samples compared with lavas of equally active Kilauea!!! Why do volcanoes grow and die??? (background article on natural laboratory concept, including donation of fibre-optic cable and vessel time by industry. Interviews ✍ with volcanologists about volcano monitoring across the range of active volcanoes - hazardous to non-hazardous, and easily accessible to poorly accessible; with a Wilson or Morgan father-figure about hotspots; maybe with communications industry or Navy person about seafloor communications. Play up the relationship between technological advances and the concept of environmental monitoring.)

☛☛ and no doubt others could be presented for headlines for the lay public with the help of good PR writers, whether or not a good scientific connection exists: the North Atlantic margins and Continental Drift; Arctic Gateways, Bering Sea, and North Pacific with changing climate; New Jersey Margin and US East Coast sea-level problems (Long-term record of sea level near Atlantic City says Trump's Taj Mahal doomed in 10,000 years!); Cascadia with chemotrophic creatures (mutant teenage ninja clams take gas!); Chile or Barbados with earthquakes, etc. [don't get me wrong; I hope Cascadia and New Jersey are drilled within next 4 years.]

- the schedule before that pizzazz window must continue to have excellent thematic drilling, including ties to global initiatives, but should be of interest chiefly to earth scientists with little chance for "grabber" headlines. The contrast would be part of the impact.

4. <u>Take some chances</u> for a big pay-off in science (and publicity) .

- Excitement comes from sudden major steps. In the scientific community excitement is a hot idea or a sudden event. To capitalize on the excitement we must move quickly to a test by drilling.

- Find a way to insert major new opportunities into the drilling schedule, whether or not "mature", whether or not they obtain top blessing of thematic panels

- Allow one wild card leg or partial leg per year, that could be inserted to replace (or postpone) a normal drilling leg.
  - penetrate and take strain measurements around fault that just caused a major sub-sea earthquake - especially tsunamigenic ones, or those of giant magnitude.

- If there arises a new, well defined but controversial theory about something that might be settled by a pattern of holes not needing extensive site surveys or safety considerations, drill it:
  climate transitions
  Cretaceous boundary & dinosaur extinction
  magnetic-reversal mechanism
  another dried-up sea floor, etc.

• Consider strongly the inclusion of legs or partial legs of high interest to applied geology, even if they don't come out at the top of the thematic panels. They will get wide attention, especially in some circles where ocean drilling has not always gotten good publicity
  - Peru clathrates and petroleum geology
  - Valu Fa sulfides and economic geology

5. Excitement in engineering development and other technology comes from what are perceived as quantum jumps rather from continued increments (big leaps vs ramping-up).

• The hydraulic piston core was such a development, but its excitement is past even though we know that it has been improved immensely (by increments) since its development.

• Whether or not next an increment is successful on the next Engineering Leg (132), hold off on publicity of DCS until it is used successfully on a scientific (or scientific plus engineering) leg. Then hit it with a full load of publicity, aimed at what it means for the future. Spread the glory around (TAMU, their contractors, TEDCOM, the SEDCO crews); see that a rash of science papers and poster sessions at meetings give lots of credit to the DCS.

• The same for slim-hole high-temperature tools, whether from LDGO, TAMU, Sandia, or elsewhere. Down-play initial publicity from incremental advances, until something big accumulates.

• There can still be a moderately high level of background publicity from successes of many other developments (drill-in casing, incremental improvements in logging, etc).

6. Direct involvement and publicity.

• The 10 to 14-day leg next March (FDSN hole north of Oahu) presents opportunities owing to its location and brevity, and minimal scientific staff required.
  - Invite Eric Bloch, National Science Board, Bob Coleman and NAS group, friendly vocal seismologists and oceanographers, presidents of GSA, AGU, IUGG, AAPG, SSA, etc.
  - Invite EXCOM!
  - Invite National Geographic, New York Times (Walter Sullivan or replacement), Philip Abelson, etc.
  - Offer either full Honolulu-to-Honolulu trip, or a half-leg trip (exchange at the site by helicopter or ship).
• There will be a West Coast port call in the ~~late-May-to-late-~~June period (San Diego?) that would be ideal for the annual meeting of the EXCOM-ODP Council. If Scripps is lukewarm - a not altogether unexpected reaction if it raises the pain of ex-DSDP - maybe a neutral site farther north is OK (Long Beach? San Francisco?).

7. Emphasize what we are doing right

• Improve the Pyle-PCOM efforts to tie to global geoscience initiatives; better still, show that ocean drilling is leading and will continue to lead the international initiatives.
  - In each of the next couple of years, strive to get legs into the program plan that combine high thematic interest of our panels and high interest to the initiatives.
  - We have many (Arctic Gateways and Bering Sea for NAD, Atolls and guyots for GSGP, several good proposals in both oceans for RIDGE-FRIDGE et al., and we should leave some cased re-entry holes for FDSN).
  - Publicize the tie if and when these legs are approved for drilling.

• To distractors, point out that the science advisory structure of program has changed from the days of the Hsu-letter example.

• Same, point out the hard work and excellent advice of the service panels.

• Show the improvements in publications schedules.

• Show that engineering at TAMU and logging at LDGO have been responsive to JOIDES, and have had many successes. Contrast this with the attitudes and quality of drilling and logging of DSDP. Suggest that the attitudes will continue into the renewal, and we have good reason to expect continued technological improvements.

• Show that, unlike COCORP, Continental Drilling, and some other large earth science projects, the range of participation in ocean drilling has been spread across many institutions and many disciplines.

• Finally, and of overwhelming importance, show that a range of excellent scientific opportunities awaits us. There is a good mix of new opportunities and important older ones retained until operations would allow their attack. There is a mix of disciplines involved. Drilling programs were distilled from a broad range of themes developed at open international conferences, and priorities for their drilling are based on peer review of proposals. Drilling competition is fierce; hundreds of proposals have been culled to a few dozen that have been drilled. That ratio, indicating the contest and scrutiny that proposals undergo, is likely to continue in the future.

I look forward to the lists and comments you will have. See you soon.

Distribution: J. Austin
M. Leinen
J. Malpas
N. Pisias

cc T. Pyle
C. Helsley

JOI Joint Oceanographic Institutions
INCORPORATED

Appendix B

Suite 800
1755 Massachusetts Ave., NW
Washington, DC 20036-2102 USA

Telephone: (202) 232-3900
Telemail: JOI.INC
Telex: 7401433 BAKE UC
FAX: (202) 232-8203

May 4, 1990

Arthur Maxwell
Institute for Geophysics
University of Texas at Austin
8701 Mopac Boulevard
Austin, TX 78759-8345

Dear Art:

One of our discussions at the Amsterdam meeting concerned regional or national briefings on ODP in order to present the current status of the program and to prepare policymakers for the upcoming renewal process. At the meeting, I agreed to begin organizing such briefings. Our recent experience in presenting ODP to the U.S. National Science Board, the governing board for the National Science Foundation, may provide some useful ideas that we can discuss further at the June meeting.

The agenda for the briefing is attached. It was very tightly constrained in time, lasting about an hour and a half. We emphasized global change and paleoclimate because of the current public interest, western Pacific tectonics because of the relation to earthquakes, new technology with an emphasis on logging, and a summary on the long-range plan. The four speakers gave an excellent summary of the program and from all accounts the briefing was very well received.

If you are interested, we at JOI would be willing to help put together such a review for individual countries or groups of countries. It would probably be best if the speakers were local so that they would know best how to respond to local interests. Please let me know if we can provide any other information prior to the June meeting.

Yours sincerely,

Jim

D. James Baker
President

cc: JOI Board of Governors
D. Heinrichs

ODP MEMO

February 26, 1990

TO: Tom Ubois, EO/NSB

FROM: Bruce Malfait, PD/ODP

SUBJECT: ODP Presentation to March NSB

Listed below are the agenda and speakers for the ODP presentation on March 16. We have told them to plan for a presentation lasting an hour. If there are questions, etc. from the Board, we might need an additional 10 to 15 minutes. If you have any questions, please let me know.

OCEAN DRILLING PROGRAM OPERATIONS REVIEW

INTRODUCTION
Dr. Robert Corell - AD/GEO

OVERVIEW OF THE OCEAN DRILLING PROGRAM
Dr. James Baker - President, Joint Oceanographic Institutions

PALEOCLIMATE STUDIES
Dr. William Ruddiman - Lamont-Doherty Geological Observatory

CRUSTAL STUDIES IN THE WESTERN PACIFIC
Dr. Patricia Fryer - University of Hawaii

DEVELOPMENTS IN LOGGING AND INSTRUMENTATION
Dr. Paul Worthington - British Petroleum Research Center

FUTURE DRILLING OBJECTIVES
Dr. Nicklas Pisias - Oregon State University

5 June 1990

Letter and FAX to *ad hoc* Strategy Committee
James Austin
Margaret Leinen
John Malpas
Nicklas Pisias
Tom Pyle

Dear Jamie, Margaret, John, Nick, and Tom:

I have three purposes for writing this letter: (1) To state my opinion that we mislead ourselves if we believe that formalizing and publicizing a focus on half a dozen drilling opportunities will help renewal of the program. (2) To report on the Ocean Studies Board workshop on facilities planning, part of which bears on the future of ODP and on the work of our *ad hoc* committee. (3) To list some of the topics that will need attention and wide discussion before the PCOM can decide to limit the program in the way we were proposing on 29 May in Washington.

(1) The basic conclusion I reach is that selecting only a few objectives on which to concentrate our drilling efforts is more likely to hinder that to help program renewal. Upon deeper reflection, I am decidedly less optimistic than when I left you. Our reason for meeting was to consider ways to improve the opportunity for renewal of the program, and I do believe that there were many good suggestions about publicity, coordination, and other means.

(2) After leaving you folks I went to a workshop on oceanographic facilities sponsored by the US NRC Ocean Studies Board, at the very plush National Academy Beckmann Center in Irvine, California. John Orcutt ran the meeting. There were presentations about facilities needed for the big initiatives (WOCE, JGOFS, RIDGE, etc; ODP by Moberly), about facilities planning by the agencies (ONR, NOAA, etc . Don Heinrichs couldn't make it at the last minute for NSF), and some special topics (Jim Baker on satellites, Bob Detrick on past funding trends, Ross Heath on "bricks & mortar", etc.).

My presentation, and what Bob and I wrote for the work-shop report, was (a) a general background to ODP, JOIDES, and JOI; (b) comments about scientific objectives being based on COSOD, White Papers, the Long Range Plan, cooperation with international geoscience initiatives*, and a possible concentration into six programs**; (c) past funding trends and identification of what NSF considers "facilities" per a conversation with Heinrichs shortly before the meeting -- not only the ship itself and equipment on board and at TAMU & LDGO, but also drilling and logging developments are within facilities -- ; (d) NSF-targeted figures for new facilities from the developments table on page 67 in the Long Range Plan; (e) current efforts for the DCS & high temperature logging; (f) BCOM-EXCOM-PCOM estimates that the current funding level is about $1M/yr low; and (g) the relation of the LRP tables to different objectives and the ramifications about alternate platforms, deep drilling, and total costs***.

* There was, of course, early discussion because John Delaney pushed ODP as essential to RIDGE. Later, Bob and I wrote something on the probable relationship between ODP and each of the international geoscience initiatives for which we have -- or expect to have-- liaisons.

** I did list them. It was when I was writing that part, however, that I realized I was no longer sold on a policy to concentrate on only six, and the result is this letter to all of you.

*** For example: $5M for a slim-line riser: why? what alternatives? what does it do to the ship? why not a different ship? and all the related questions we have heard.

Although the meeting was about oceanographic facilities, the group's conversation ranged across a lot of territory. We had descriptions of successes and failures in moving other initiatives forward, and in their relationship to core programs in NSF, ONR, the USGS, and NOAA. In the later discussion, there were suggestions that maybe ODP renewal should aim for the length of the TAMU-SEDCO agreement, after which time we go from a generalized vessel to one or two or more specialized ships in this country or France or Japan or whatever for the late 90s. Sort of what Ken Hsü was preaching, but on a later schedule.

There was some sniping back and forth -- at NOAA because maybe they didn't need more ships, at ONR because their ideas of ship type and distribution to the academic fleet didn't jibe with UNOLS and academic ideas, and at NSF and various initiatives by other initiatives. But I heard nothing against ODP in the Coleman vein of "now it is time for something else". Maybe they talked behind my back, but in public there was no general question of the program's continued existence, just specific questions about logging needs or the riser or the length of the SEDCO contract. (By the way, John Orcutt and Bob Detrick also recommended that the Long Range Plan be sent to OSB with a request for a formal review.)

(3) Here are some further thoughts on the discussion of narrowing our sets of themes for future drilling, and other topics related to program renewal. They have to do with the ramifications of our plans on such points as

- panel interests,
- funds for US scientists,
- Global Change,
- international geoscience initiatives,
- specific criticisms of ODP,
- national interests,
- the use of alternate platforms, and
- credibility.

I suggest we go over these points with our EXCOM members and scientists in our own institutions and elsewhere.

• One concern has to do with **panel interests** and I use OHP as an example. What should be the the wording of our proposed transformation of the objective termed "High-resolution Neogene paleoceanographic transects especially within the Pacific Basin", of Phase 1 of the Long Range Plan? We have had a successful leg at Ontong Java and we have scheduled a leg in the eastern equatorial Pacific. The high ranked North Pacific and Bering programs have Neogene components, but they are not necessarily the most important components. For the Neogene transects elsewhere, the south equatorial Atlantic and the California Current proposals only fared moderately well with OHP. On the other hand, OHP at its fall 1989 and spring 1990 meetings was far more interested in high latitude drilling than in high-resolution Neogene, *per se*. That interest is reflected in panel rankings and minutes. The high northern latitude proposals rated highly for both the Pacific and Atlantic have Neogene and older objectives. OHP also expressed the strong desire to see better Antarctic proposals.

There was also the original selling point for ODP over a continuation of DSDP that a larger vessel than the *Challenger* would be able to work at high latitudes. Finally, there is the present selling point for ODP renewal that we intend to coordinate our work with other international geoscience initiatives; high-latitude ODP drilling will tie what is currently known with what Nansen Arctic Drilling hopes to learn.

On the other hand, some believe that a substantial contribution of the oceanographic and geologic communities to "Global Change" can only come through high-resolution Neogene studies, in which case the wording "high-resolution Neogene" ought to be in our restricted group of themes. Others believe that there is a broad span of ocean-history contributions possible. (but more on the topic of Global Change below).

So I recommend that OHP and PCOM debate a choice of wording; should a theme be termed something like High-latitude Paleoceanography?

If we do decide to select only six objectives, the other thematic panels would want to hone the wording of the other selectees as carefully as OHP would look at the one just presented.

• Some further thoughts stem from my hours to ruminate on the airplane, and in Irvine where there was almost as much discussion of **funding scientists** as of funding facilities. Bob Detrick displayed some NSF funding figures showing that at the beginning of ODP there was a 2-year ramp-up in MGG funding (core went down very little compared to new money in ODP plus USSAC). In contrast, the more recent programs of WOCE and JGOFS haven't had an increase in PhysO and ChemO equivalent to the earlier MGG one. Not nearly enough has gone to these two newer initiatives to allow them to progress as planned, and it is not really much new money, just robbing the core.

If ODP fails renewal, there is little chance that most of the ODP "science" part, as distinct from drilling operations, will be added to the MGG core. The former "ramp-up" would become a "ramp-down" that will increase the PI load on the MGG core, and drive the proposal success rate well below its present 20%. That possibility strengthens my resolve to work for renewal.

But the ramifications of Bob's presentation also bear on our plan to guide most of the drilling over the next several years into six moderately narrow objectives. I had mentioned to you last Tuesday that one of the strong lines of support for ODP in the US is that a range of disciplines are within the fold. Then I was merely thinking of that as a loss of some voices supporting renewal. Now I also see it as leading to an increased assault on MGG core funds by those soft-money scientists frozen out of a more restricted ODP. Perhaps there is no correlative specter outside the US, but here it is one that should lead the US members of PCOM to be cautious in exactly what few objectives are selected, and how they are worded.

• Also at the Irvine meeting there was considerable gnashing of teeth that the US science-powers-that-be had not offered a greater role in **Global Change** studies to the marine and earth sciences. Almost all of the US funding is being directed towards recent climate and such atmospheric science as cloud studies. As you know, our non-US ODP partners have been clamoring to identify a more substantial part for ODP in Global Change. We have tried, but we must keep trying to find that part. I had not seen the letter from Tom Pyle to Ellen Mosley-Thompson until I got back here. Was it discussed after I left you? I see that it is copied to Jamie and Margaret (it is about a US draft report).

• PCOM will need to consider in August how each of the **international geoscience programs** relate to the selection of six objectives in a narrower ODP. As I said, in Irvine we were requested to write something on the overall relation of ODP to each of several programs. We tried -- it was easy for some and more difficult for others. When I get a copy of the edited draft I'll send copies on to you. [Incidentally, Margaret, the easternmost equatorial JGOFS line was already shown on a JGOFS illustration as a contribution by ODP! Great!] Presumably our liaison guests in August will help us judge how the "selected six" will relate to their objectives.

• Selecting a few themes and concentrating drilling time on them does not, in itself, answer many of the **specific criticisms** we have received recently. Not Bob Coleman's criticism about ho-hum science, nor Ken Hsü's about the difficulty to introduce innovative legs, nor Chuck Drake's about non-JOIDES members on PCOM. In fact, Coleman could say that by cutting down on the competetion between programs (by guaranteeing a chosen six), we will concentrate our dose of ho-hum science. Hsü would show that it will be harder to introduce innovation. Drake would claim that the old boys have made another secret decision in the cloak room.

Depending on which themes are selected, concentration might answer Robinson's about more legs to answer a question, or Sangster et al.'s about economic geology, or Warnke's about the high-latitude Pacific, but they would be offset by a bolus of new complaints about other pet programs being left out.

True, further focus would help the planning of facilities and the development of drilling and logging techniques. If thematic focus is tied to certain areas, it would help the planning of surveys. But it won't help renewal.

• I believe we agreed that one absolute requirement for renewal is full international participation, and **national interest** is a part of that. At our meeting we did talk about the "lollypop" concept. Also, we went over what we thought the reactions of the partners might be to the selection of these specific six objectives. We concluded that with the possible exception of the UK all might agree. With the UK we were concerned with Hugh's own interest in the Mesozoic, and thought that might be satisfied by some atoll & Guyot drilling in sea-level studies, and deep drilling on passive margins. In further reflection, I recall that in Paris Hugh remarked that the popularity of the drilling program in the UK, where there are few oceanographers, was strong because such a wide range of geologists also support it.

I believe we should be careful in what we write for wide circulation until we have a thorough discussion among all the partners, and not just try to guess what each country or consortium wants.

• As I said, at Irvine in the discussion of facilities, there were comments that maybe ODP renewal should aim for the length of the TAMU agreement with SEDCO, and that after that time we should go from a generalized vessel to one or two or more specialized **alternate platforms**, in this country or France or Japan or whatever. Admittedly, this was not one of our panels giving advice to JOIDES, but they were persons who run oceanographic institutions, plan ship-building, worry about long-term budgets for facilities, and so on. Perhaps we will hear the same advice from within JOIDES: If Charles Sparks' report of TEDCOM's first reaction are any hint of what the deep-drilling group we will set up will advise, maybe deep drilling is only likely to come about if we plan a special structure for it.

Almost certainly, however, our proposal for renewal should be for the *JOIDES Resolution* as a multi-purpose drilling vessel for 10 years. Nevertheless, we should have in mind a fall-back position in the event that the powers-that-be decide on a renewal length of less that 10 years. We must not only take care that our choice of a few objectives fits to the present level of engineering development but also see how they fit to the possibility of future alternate platforms.

• Finally, I take the topic of **credibility**. On the one hand, we answer criticism about publications and the thematic advisory structure by saying that changes are recent and we need to let them stand for a while before we tinker again. We have a backlog of COSOD and White Paper objectives, many of which are addressed by proposals by persons who followed exactly what we said they should do. We asked our panels to rank the proposed drilling programs, and they followed exactly what we asked them to do. Can we now afford to break our rules?

In summary, I believe renewal will be helped by keeping the program international, by finding a way to get innovation into our planning but otherwise by keeping faith with our panels, by showing not only how we serve new international geoscience programs but also how we lead them (and by finding how best to work with Global Change), by keeping and rewarding a broad clientele, and by strong public relations including "popular" information for the layman.

What do you think?

With best wishes for renewal,

Sincerely yours,

Ralph Moberly

152JOI

Joint Oceanographic Institutions
INCORPORATED

Suite 800
1755 Massachusetts Ave., NW
Washington, DC 20036-2102 USA

Telephone: (202) 232-3900
Telemail: JOI.INC/Omnet
Telex: 7401433 BAKE UC
FAX: (202) 232-8203

July 2, 1990

Mr. Erich Bloch, Director
National Science Foundation
1800 G Street, NW, Room 520
Washington, DC 20550

Dear Dr. Bloch:

The current phase of the Ocean Drilling Program (ODP) will be ending in October 1993, and the process of formal program review and evaluation for renewal will soon begin. We, the undersigned, as the directors of the ten major oceanographic institutions in the United States and as members of the Board of Governors of Joint Oceanographic Institutions Incorporated (JOI), would like to register our enthusiastic and unanimous support for continuation of this program.

In geosciences research, we consider it one of our major responsibilities to identify and promote directions of scientific inquiry within the totality of earth sciences that will have maximum impact and will optimize scientific returns. We consider the Ocean Drilling Program to be one such essential research endeavor that will continue to have a substantial influence across the full spectrum of the earth sciences. The enclosed brochure highlights the accomplishments and the future directions of ODP. We particularly look forward to obtaining exciting new drilling information that will bear on the composition and dynamics of the earth's interior; the origin, deep structure and evolution of continental margins and oceanic crust; and global paleoceanography and its links to global change.

Three aspects of ODP warrant special mention. One is the breadth of the program in terms of its representation of the earth science community. On the national level more than half of the membership and panel chairmen in the program advisory structure are scientists from non-JOI institutions, industry, and government. Similar statistics apply to the shipboard scientists who participate in the program aboard the drillship JOIDES Resolution. A significant proportion of shipboard scientists are graduate students, demonstrating the major role ODP plays in earth sciences education. In addition, the program has a very strong international character, and it has been an unqualified

success in both the demonstration and practice of international partnership in cooperative research.

A second aspect is the partnerships which are developing between ODP and other major research initiatives to enhance greatly the quality and impact of research on mutual goals. The RIDGE program, for example, will provide high-density regional and local geological and geophysical survey data near ocean spreading axes that are important for siting boreholes in oceanic crust and properly extending the results to three dimensions. In turn, drilling will provide to RIDGE the ground-truth data critical to understanding processes of crustal accretion, hydrothermal flow, and tectonism of mid-ocean ridges. In another instance, ODP will provide the boreholes necessary for intracrustal emplacement and testing of submarine seismometers that may be used to expand the Global Seismic Network into ocean-floor regions that are critically undersampled. ODP is working closely with the planning for studies of global change as revealed by earth history being carried out by the International Geosphere-Biosphere Program. Cooperative ventures with continental and Arctic drilling are also pending.

Finally, we note several international moves (by France, Japan, and the USSR) in the direction of possibly constructing and fielding drilling vessels dedicated (at least in part) to scientific ocean drilling that will complement ODP. We view this development as a clear confirmation of the high scientific priority and technological achievements of ocean drilling and as a reflection of the quality and success of ODP and its predecessor, the Deep Sea Drilling Project. It appears that these new drilling vessels may be available toward the end of this decade. As a consequence, continued support of ODP by its present international partners is anticipated, with a review of platform availability and program needs taking place in approximately 1998.

We are very positive about the coming decade of the Ocean Drilling Program and its importance in understanding both the history and the future of the earth and earth processes. We stand ready to assist in any way during the coming review process.

Yours sincerely,

Directors of the Member Institutions of Joint Oceanographic Institutions Incorporated

cc: Dr. Frank Press
Dr. D. Allan Bromley
Dr. Robert White

Dr. Edward A. Frieman
Scripps Institution of Oceanography
University of California

Dr. Dennis V. Kent
Lamont-Doherty Geological Observatory
Columbia University

Dr. C. Barry Raleigh
School of Ocean and Earth Science and Technology
University of Hawaii

Dr. Bruce R. Rosendahl
Rosenstiel School of Marine and Atmospheric Science
University of Miami

Dr. Douglas R. Caldwell
College of Oceanography
Oregon State University

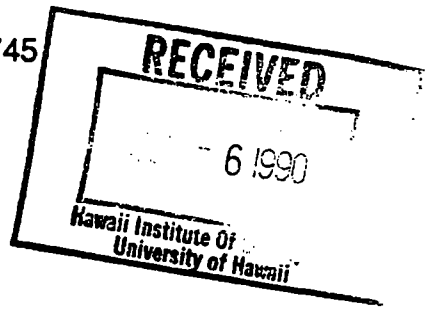
Dr. Robert A. Duce
Graduate School of Oceanography
University of Rhode Island

Dr. William J. Merrell
Texas A & M University

Dr. G. Ross Heath
College of Ocean and Fishery Sciences
University of Washington

Dr. Craig E. Dorman
Woods Hole Oceanographic Institution

Dr. Arthur E. Maxwell
Institute for Geophysics
University of Texas



Posted: Wed, Jun 6, 1990 9:04 AM EDT Msg: KGJA-4284-7745
From: N.SHACKLETON
To: joides.hig
CC: n.shackleton
Subj: r.moberly

Dear, Ralph, in conversation with a PCOM member recently (Hugh), I gained the impression that you (collectively) are under pressure from the community for the old reason "group of insiders...". I suddenly had an idea that you might float to PCOM which could combat this perception. You have more than once said to panels that programs of less than, equal to and greater than one leg can be considered and prioritised. How about going to the community to solicit single hole (or "less than 3-day" or some other arbitrary cutoff) proposals, with a commitment to accepting (n) per year? Initially this may be seen simply as a device on my part to get some more OHP in, which is not my intention (though I do think that there may be some distress from the OHP community if it sees two years of Pacific drilling coming up with only one Ocean History leg). However, I strongly suspect that there is a lot of other (i.e. non-OHP) science that could be done this way as well.

Copy for August Agenda Book
" for Austin
Leinen
Malpas
Pisias
Pyle

At present, little add-on projects are in practise generated almost exclusively by the panels. The panel says "OH, if you are going there, some basalt would be very helpful for the following reason..." That is entirely fair- but how much nicer if PCOM also had a competing proposal "OH, if you are going there it would be very nice to have 100 metres of red clay for the following reason" and another "OH, if the track passes there it would be nice to test the notion that we can do accurate enough stratigraphy off Hawaii to make proposal 999/E feasible". If PCOM were to announce the general ship-track plan and explicitly solicit small proposals this would certainly increase the number of satisfied proponents and probably ggreatly increase the chance of new proponents getting in. I also think that it would provide a counter to the tendency for all proposals magically to require just over 60 days of ship-time.

Posted: Thu, Jun 7, 1990 11:28 AM EDT Msg: MGJA-4289-6561
From: T.PYLE
To: JOIDES.HIG
CC: M.Leinen, J.Malpas, N.Pisias, N.Shackleton

Ralph
Nick's idea sounds good to me (I had proposed it somewhere (COSOD II? / Sometime) so of course, it's brilliant). I had thought of it mainly in an OHP context because of the need for global coverage. In discussions with John Imbrie, it was obvious that someone needed to draw up a series of maps showing distributions of DSDP/ODP cores for a number of time slices in order to aid such planning. The idea might work for other themes as well - especially if it is widely advertised as a new idea, rather than just mentioned to the panels.
Cheers, Tom

JOI Joint Oceanographic Institutions
INCORPORATED

Suite 800
1755 Massachusetts Ave., NW
Washington, DC 20036-2102 USA

Telephone: (202) 232-3900
Telemail: JOI.INC/Omnet
Telex: 7401433 BAKE UC
FAX: (202) 232-8203

June 7, 1990

90-289

Dr. Wolfgang Engel
Geosciences Editorial
Springer-Verlag GmbH & Co.
Postfach 105280
6900 Heidelberg 1
Federal Republic of Germany

Dear Dr. Engel:

Thank you for your letter of 28 May 1990 regarding our interest in thematic issues of Scientific Drilling focusing on ODP.

We would enthusiastically support such an idea and would do all we can to encourage authors to submit top quality papers. I talked briefly yesterday with Roger Anderson, Editor-in-Chief, about this. We thought we should initially aim for a group of submissions in late 1990. However, we should probably discuss your plans and ideas in more depth after I get some feeling for the community's level of enthusiasm for the idea.

Thank you for encouraging such an effort.

Sincerely,

Thomas E. Pyle
Vice President
Ocean Drilling Programs

cc: R. Moberly, PCOM Chairman
R. Anderson
PCOM Members
Panel Chairmen

June 6, 1990

90-299

Log, + this sheet for Aug. Agenda Book

Charles Sparks
Institute Francais du Petrole
B.P. 311
92506 Reuil Malmaison Cedex
France

Dear Charles:

Thank you for the package of correspondence concerning the deep drilling meeting for September 26. Of course I am planning to be there. Here on JOIDES Resolution I have discovered a book entitled The Superdeep Well of the Kola Peninsula edited by Yevgeny A. Kozlovsky translated from the Russian (Springer-Verlag, 1984). The editor is, or was, at

Ministry of Geology of the USSR
4/6 B. Gruzinskaya
Moscow 123812, USSR.

I shall occupy myself for some time with it before I get off the ship.

As to who should head up the task force, I will be sailing with Dan Reudelhuber, thus we should at least be pointed approximately in the same direction by the end of Leg 132. I think I favor sort of a joint-tenancy approach, at least in terms of structuring meetings with scientific input. I will certainly at least be a PCOM liaison, but there should be scientific as well as technical direction for the task force. But I am not sure whether the person who provides scientific input actually should head the task force. No doubt PCOM itself will venture an opinion on this.

At the August PCOM meeting, I hope to present the point of view that the September meeting should be more than an information exchange; that it should make recommendations so that after some specified period of time, a document will exist spelling out what will be required for very deep drilling, and the procedure to cost it. This will be the principal function of the task force. At some point, if the community chooses to proceed, this will have to be factored into a proposal.

In the meantime, I am thinking seriously about how scientific planning should proceed for such a venture, and what ODP can do in the interim to help make it happen. Some mobilization is required.

One final thought. Apart from panel liaisons, I would like to see someone well acquainted with logging and experiments in the ocean crust attend the meeting. Perhaps the functions can be combined. But I think either Roger Anderson or Keir Becker should be in attendance, perhaps both.

I look forward to contacting you in August about Leg 132, and seeing you in September.

Sincerely,

James H. Natland

The University of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

May 11, 1990

Dr. Bernt Zeitzschel
JGOFS-buero
Institut fur Meerekunde
Duesternbrooker Weg 20
2300 Kiel 1
FR Germany

Dear Bernt,

The Ocean Drilling Program is in the process of establishing liaisons to other major earth science programs. For example, formal liaisons have now been established for the Global Sedimentary Geology Program, the Federal Digital Seismic Networks and the Nansen Arctic Drilling Program. Liaisons have been identified for IGBP as well, but have not been formalized. Dr. Thomas Pyle of JOI, Inc., the contractor for the Ocean Drilling Program, will be contacting you soon with a request that JGOFS establish a liaison with ODP. I am writing to encourage the JGOFS Steering and Executive Committees to endorse such liaison and to identify the specific ways in which ODP will be contributing the JGOFS scientific objectives in the near future.

The enormous size and seasonal to interannual variability of the equatorial Pacific make it a challenging region in which to complete a meaningful JGOFS process study. In order to make best use of opportunities to collect data and samples from ships of opportunity working in this region the participants at the recent JGOFS equatorial Pacific workshop in Tokyo identified a restricted set of measurements that could be made from vessels of opportunity which would add substantially to the overall program of JGOFS studies in the region. These include meteorology and ship positioning; CTD, O2, fluorometry, optics (at least PAR), collected samples for analysis of nutrients (NO3, NO2, PO4, Si(OH)4, and NH4), POC/PON, extracted chlorophyll and phaeopigments.

A specific opportunity that was highlighted at the meeting was the collection of such data and samples during a scheduled cruise of the Ocean Drilling Program (ODP) drilling ship, the JOIDES RESOLUTION. The ship will be drilling at twelve sites along N-S transects at 95°W and 110°W in the equatorial Pacific during the late spring of 1991, a period during which several nations will have JGOFS cruises in the equatorial Pacific. Because the ship will occupy stations for 3-6 days, it offers the opportunity to collect repeated samples at several locations. Preliminary discussions with the Ocean Drilling Program Planning Committee and the drilling ship operator indicate that they are interested in cooperating with us to take these samples. These measurements and samples will be especially important as several stations are located at the sites of long-term US NOAA moorings.

A second opportunity of interest to JGOFS arose at the recent ODP Planning Committee meeting in Paris last week. The ship will be drilling a site north of Hawaii during the late winter of 1991. All indications are that this site could be placed at or near the location of the US JGOFS ALOHA time series station. Although sediment coring had not been planned for the program, the Planning Committee has indicated that it would be pleased to receive a proposal for collecting sediment cores as part of the work at the station. Because the time involved will be minimal compared to other work planned at the station it is likely that the coring will be done. This would provide JGOFS scientist interested in sediment studies in association with the time series station an opportunity to collect sediment at no expense to JGOFS. The ODP is also willing to collect the surface water data set mentioned above which at this station if it would be of use to the scientists engaged in work at the time series station.

It is heartening to see these offers by the Ocean Drilling Program to collect samples otherwise unavailabel for JGOFS investigators and to accommodate JGOFS proposals for coring. There is a vigorous community of earth scientists who participate in both the JGOFS and ODP programs and I urge the Steering and Executive Committees to endorse and establish the liaisons.

Sincerely,

Margaret Leinen

Margaret Leinen

cc: T. Pyle
P. Brewer
✓ R. Moberly
M. Fasham
E. Tidmarsh
J. McCarthy

The University of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

May 11, 1990

90-246

Dr. Ralph Moberly
Chairman, Ocean Drilling Program Planning Committee
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, HI 96822

Dear Ralph,

On behalf of the Joint Global Ocean Flux Study I would like to request that the Ocean Drilling Program collect a set of measurements and samples of great value and interest to JGOFS scientists during the time that the JOIDES RESOLUTION is on station drilling sites for the Neogene Eastern Equatorial Pacific Paleoceanography leg. The measurements and samples include: meteorology and ship positioning, CTD, O_2, fluorometry, optics (at least PAR), collected samples for analysis of nutrients (NO_3, NO_2, PO_4, $Si(OH)_4$, and NH_4), POC/PON, extracted chlorophyll and phaeopigments. Preliminary discussions with the ODP Science Operator indicate that it should be possible to collect this data and these samples on a non-interfering basis with drilling operations.

If this request can be accommodated I will be happy to provide information to the Science Operator, the co-chiefs of the leg, and any interested scientists concerning the nature of the measurements and the JGOFS protocols for collection of the samples. I will also be happy to work with the Science Operator and the co-chief to formulate a plan for collecting the data and samples which can be accommodated during the cruise.

Sincerely,

Margaret Leinen

Margaret Leinen
Chair, JGOFS Equatorial Pacific
Process Study Workshop

cc: B. Zeitzschel
P. Brewer
N. Shackleton
N. Pisias
L. Mayer

UNIVERSITY OF Miami

90-306

AGENDA Book

14 June, 1990

Dr. Ralph Moberly, PCOM Chairman
Hawaii Institute of Geophysics
2525 Correa Road
Honolulu, HI 96822

Dear Ralph,

The purposes of this note are first to inform the JOIDES office of a new downhole experiment now under development, and second to request that PCOM and DMP consider scheduling for Leg 136 (Engineering 3A) a test of a prototype of this device. The new experiment, the concept for which has already been presented to DMP, is an instrumented borehole seal that is ultimately intended for long-term deployment during the sedimented ridges and Cascadia drilling programs. The development of this seal is a joint effort among TAMU-ODP engineers (T. Pettigrew and A. Fisher), Canadian scientists (E. Davis and engineers), and U.S. scientists (B. Carson and myself). The Canadian part has already been funded and NSF has recently informed Carson and myself that they will fund our part. TAMU will assemble the sealing hardware at the cone from components already available in industry, Davis will develop the data logger, and Carson and I will develop the downhole sensors and fluid sampling capability. For your reference, I've mailed a copy of the Becker/Carson proposal which is to be funded by NSF.

T. Pettigrew just returned from Leg 131 and, after meeting with Barry Harding, informed me that ODP intends to have a prototype of the hardware to seal at the cone ready for testing during Leg 136. We request approval for a test deployment of this sealing device, but not the downhole sensors or data logger, which will be tested elsewhere. The test would require a reentry cone of current design, so the cones at 504A and 504B would be inappropriate for this test; instead, the engineers suggested that the best test site would be the cone of the OSN pilot hole to be drilled during the first part of Leg 136. The equipment to be tested would be incorporated in the BHA and would be deployed only in the cone, and the test would pose very little risk to the hole. This test would be an essential step toward achieving actual long-term deployments 2 legs later during Leg 138.

We request that PCOM and DMP consider this matter at their summer meetings. With regard to the time requirements, Barry Harding informed me that TAMU had not yet made a detailed time estimate for the work already approved at the OSN site, and it is presently unclear whether a test of the borehole seal could be accomodated within the time already scheduled or would require perhaps another day. I realize that this note gives very little notice for the DMP in two weeks, so I have taken the liberty of directly forwarding copies to P. Worthington and the two PCOM liassons. In addition, B. Carson is both a DMP member and co-P.I. on the borehole seal, so he will be available to explain details of the device and the proposed test deployment. I will be at the August PCOM and will be able to provide similar information.

Sincerely

Keir Becker

Keir Becker

cc: B. Harding
B. Carson
E. Davis
P. Worthington
M. Langseth
D. Cowan
G. M. Purdy

Rosenstiel School of Marine and Atmospheric Science
Division of Marine Geology and Geophysics
4600 Rickenbacker Causeway
Miami, Florida 33149-1098
(305) 361-4663

Cornell University

DEPARTMENT OF GEOLOGICAL SCIENCES
SNEE HALL • ITHACA, NEW YORK 14853-1504
TELEPHONE: (607) 255-5267 FAX: (607) 254-4780

July 19, 1990

Dr. Ralph Moberly
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, HI 96822

Dear Ralph:

The Geoprops Probe is finally ready for its land testing at TAMU-or rather, all parties and elements concerned are now back on the scene. We plan the test for the first week in August.

Discussions with ODP personnel indicate that the first suitable ODP leg for which both the new Navidrill and Geoprops Probe will be ready is 138 (Sedimented Ridges). I feel that the Geoprops Probe would provide scientifically valuable temperature, pore pressure, and pore fluid chemistry. I have been trying to contact Earl Davis to ask if he would interested or willing to try out the tool.

I will inform you personally or through an ODP representative as to the outcome of the land tests at TAMU.

Sincerely,

Daniel E. Karig
Professor

meg

Detlef A. Warnke,
Dept. of Geological Sciences,
California State University, Hayward
Hayward, CA 9454

17 April 1990

90-222

Dr. Ralph Moberly,
PCOM Chairman,
JOIDES Planning Office,
Hawaii Institute of Geophysics,
School of Ocean and Earth Science and Technology,
University of Hawaii,
2525 Correa Road,
Honolulu, Hawaii 96822

Dear Dr. Moberly,

This letter is in response to you letter of 12 October 1989 -> expressing concern about non-representation of faculty not affiliated with JOIDES institutions. This concern is indeed justified, particularly in the case of those of us who are affiliated with what is politely called "teaching universities". However, no matter what our affiliation, I do see a great underrepresentation of "paleo-environmental" considerations in the planning of the forthcoming legs, as published in JOIDES Journal. This is very puzzling, particularly in view of the great success of the past antarctic/subantarctic legs, which certainly have advanced our understanding of antarcticl glacial development by a quantum leap. I would have thought that in view of these proven successes, further high-latitude drilling in the Pacific would have been a logical continuation of these highly fruitful endeavors.

The lack of planning for other high-latitude legs, cannot be ascribed to the lack of drilling proposals, since for instance both Drs. Bornhold and Barrett have proposed such drill sites (I understand that these are "mature" drilling proposals--but I may be wrong in this assumption). Failure to plan high-latitude legs IN THE PACIFIC is even more dissappointing in view of the current, public concern for things environmental, and the possibility of using this concern in the severe competition for public funds. Please don't interpret these remarks as reflecting some kind of landskenet mentality, but merely as the posssibility of a happy coincidence of the research interest of many of us with public, environmental awareness.

It would take two legs, a miserly period of a little over four months, to follow "in the footsteps" of Legs 18 and 19, as well as Legs 28 and 35. There is of course no comparison in tech-

nical sophistication between those early cruises and what the vessel can and does accomplish today. The seeming haste with which the vessel is forced to exit the Pacific deprives us of an absolutely golden opportunity to learn more about Tertiary paleo-environmental evolution of the high-latitude Pacific. It will be many years before such an opportunity arises again, if indeed it ever arises again at all. If at all possible, please consider planning for two high-latitude legs in the Pacific before the vessel moves into the Atlantic.

Thank you for your consideration.

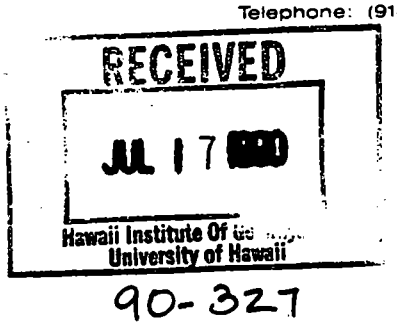
Sincerely yours,

Detlef A. Warnke,
Professor of Geological Sciences.

Lamont-Doherty Geological Observatory | *Palisades, N.Y. 10964*
of Columbia University

Cable: LAMONTGEO
Telex: 710-576-2653
Fax: (914) 359-2931

Telephone: (914) 359-2900



90-327

July 9, 1990

Dr. Russell B. Merrill
Manager of Science Services
Ocean Drilling Project
1000 Discovery Drive
College Station, TX 77840

Dear Russ,

dead·line (ded'lin'), n 1. originally, a line around a prison beyond which a prisoner could go only at the risk of being shot dead by a guard. 2. a boundary which it is forbidden to cross. 3. a time limit, as for a payment, news story, etc. (from: Webster's New World Dictionary of the American Language).

The time has come for ODP to either change the definition of "deadline" in your version of the Handbook (perhaps "twilight-time" ?) or else start enforcing a shoot-to-kill policy on late manuscripts: if it's late, it doesn't get into the volume, no exceptions, no extensions, even for co-chiefs. It's amazing how the immediate threat of death will concentrate the minds of all those procrastinating scientists out there that you have to deal with. It works in my lab -- it works in publishing houses around the world -- and it will work at ODP after you shoot the first victim (be sure it's a loud-mouth big-shot so the word gets around quickly). You guys have enough problems keeping the publication schedule.

Last week I learned that Volume 114B (Proc. ODP, Scientific Results) was pulled out of the production schedule in December or January to allow one of the co-chiefs, Paul Ciesielski, to revise (one more time) the chronostratigraphy. Today I confirmed this via telephone with your publications staff, and learned that this volume is only now approaching completion, still lacks at least one major manuscript from Ciesielski, and will apparently not be put to bed until October for distribution after December, 1990, about a year late and postponed beyond 116B. I have further learned that select 114B-authors were aware of the situation and have been permitted to append, alter, or add material to manuscripts in the intervening nine months while most of the shipboard scientists were not even notified of on-going changes.

This situation is totally unacceptable for your professional editorial staff, for the shipboard scientists who have manuscripts in the volume, and for the Drilling Project as a whole. It was my understanding when I resubmitted final, revised versions of my manuscripts (114B-149, 114B-153) in September and October of 1989 that the volume was closed. I further accepted the implicit understanding that the chronostratigraphic interpretations of the paleomag. and biostrat. data, as generally agreed to by late summer 1989, would be used throughout the various papers in 114B in order to maintain an internal consistency within the volume.

It is absolutely necessary to "freeze" the stratigraphic revisions at some point in time (the "deadline") in order to produce coherent manuscripts based on the same information, in full knowledge that future revisions will modify or even invalidate portions of the record. It is therefore scientifically totally unacceptable that ODP allowed continuous revisions in stratigraphy to hold up the publication of this volume without allowing all authors the option of revising their interpretations to coincide with the evolutions that have occurred in the last nine months. **THAT IS WHY WE HAVE DEADLINES !!**

I don't know whose responsibility it was to make this decision, but by copy of this letter to the Leg 114 shipboard participants, IHC, EXCOM, and PCOM, I demand that 114B be closed as of the deadline (November 1, 1989 ?), that any revisions since then be discarded, and that any papers that have appeared since the deadlines which Lona Dearmont approved in Fall of 1989 be omitted,

and that the volume be immediately put to bed. In short, gentlemen, unless you maintain the stratigraphic integrity of operational deadlines, every manuscript in the whole bloody thing will have to be redone.

Philip N. Froelich
Senior Scientist and Associate Director
ODP - Sedimentary and Geochemical Processes Panel

cc: Leg-114 Shipboard Participants, IHP, EXCOM, PCOM

ODP PROPOSAL LOG SHEET

410

JOIDES No: 265/D Add.

Received: 6/90

neral Title:
roposal to Drill Western Woodlark Basin

Proponents:
S.D. Scott, R.L. Chase, R.A. Binns, E. Finlayson

Area: Pacific ; Western Woodlark basin

1st Submission:
Contact Acknow.:
Dr S.D. Scott
Date acknow.:
6/90

Eval. Panels	Copied to
TECP	JOI
OHP	SS Databank
SGPP	Sci. Operator
LITHP	

Contact Proponent: Dr S.D. Scott
Department of Geology
University of Toronto Toronto
M5S 1A1 Canada
Tel.: (416) 978 3022 Fax: (416) 978 3938

Comments:
This addendum is to alert the panels to recent developments and near-future plans which will result in a mature proposal.

Objectives:
Petrology and tectonics of ocean ridge propagation into continental crust

PROPOSED DRILLING SITES

Site Name	Latitude	Longitude	Water depth	Penetr. Sedim.	Penetr. Basem.	Comments
						No Proposed Sites

ABSTRACT

The purpose of this addendum is to inform on the recent developments and near future plans which will result in a mature proposal for Western Woodlark. Western Woodlark basin offers a unique opportunity to study the propagation of an oceanic spreading axis into continental lithosphere. The petrological and tectonic transitions from oceanic lithosphere to continental lithosphere through a zone of stretched continental crust are being clarified by several cruises. MORBs generated by well organized seafloor spreading appear to give way along the direction of propagation to transitional and felsic volcanic rocks in discontinuous segments over a distance of 45 n.mi. The main objective of this proposal is to test the third dimension with a deep hole in the leading edge of the propagating rift zone.

ODP PROPOSAL LOG SHEET

409

JOIDES No: 317/E

Received: 6/90

General Title:
A test of a model for the formation of methane hydrate and seaflooor bottom simulating reflectors by drilling on the Northern Cascadia subduction zone.

Proponents:
R.D. Hyndman

Area: Pacific ; Northern Cascadia subduction zone

1st Submission:
Contact Acknow.:
R.D. Hyndman
Date acknow.:
6/90

Eval. Panels	Copied to
TECP	JOI
OHP	SS Databank
SGPP	Sci. Operator
LITHP	Casc. DPG me...

Contact Proponent: Dr. R.D. Hyndman
Pacific Geoscience Center
Geological Survey of Canada Sidney
B.C., V0S 1M0 CANADA
Tel.:

Objectives:
Nature and process of formation of hydrate BSR's.

Comments:
2nd addendum to proposal 317/E.

PROPOSED DRILLING SITES

Site Name	Latitude	Longitude	Water depth	Penetr. Sedim.	Penetr. Basem.	Comments
						See Cascadia Drilling Program

ABSTRACT

This is is an second addendum to proposal 317/E for drilling several shallow holes (300-400m) through a bottom simulating reflector (BSR) to test a model for formation of methane hydrate BSRs. The primary objectives of this model testing are: 1) to test by borehole thermal, geochemical and pore pressure measurements that there is pervasive sub-vertical fluid expulsion in areas of strong BSRs landward of the deformation front. Such upward fluid expulsion is required by the hydrate model and is suggested by previous thermal and seismic data. The BSR is inferred to be permeable; 2) to test through direct core sampling, downhole logs and pore fluid geochemistry, that hydrate is concentrated near the base of the stability field, decreasing upward in the form predicted; 3) to test that the hydrate layer and sediment properties are of the form that will produce the impedance contrasts inferred from the seismic data for the BSRs, without free gas; 4) to test that the depth profile of the methane (and perhaps CO_2) dissolved in the pore fluid is of the form predicted, i.e., higher beneath compared to above the BSR, and that there are associated differences in sediment diagenesis; 5) to test that the laboratory defined stability fields for hydrate are applicable to the seafloor environment, and determine which fluid composition is applicable, i.e., pure methane and sea water salinity fluid, or different salinity fluid with CO_2 or higher hydrocarbons. This calibration is essential to confirm that the depth to the BSR can be used as a geothermal heat flow indicator.

ODP PROPOSAL LOG SHEET

411

JOIDES No: 384/A Rev.

Received: 7/90

eral Title:
An ODP Proposal to study the connection between the Pacific and Atlantic Oceans: the Venezuela Basin and Aruba Gap.

Proponents:
A. Mauffret, G. Waggoner, A. Mascle, J. Diebold

Area: Atlantic ; Venezuela basin and Aruba basin

1st Submission:
Contact Acknow.:
Dr A. Mauffret
Date acknow.:
7/90

Eval. Panels	Copied to
TECP	JOI
OHP	SS Databank
SGPP	Sci. Operator
LITHP	

Contact Proponent: Dr. A. Mauffret
Département de Géologie Marine
Université P. & M. Curie 75252 Paris
FRANCE
Tel.: (33) 1 43 36 25 25 (33) 1 43 54 40 97

Comments:
Revised version of proposal 343/A.

Objectives:
Paleoenvironment of the Jurassic and Cretaceous series. Nature and age of the basement. To drill through an oceanic plateau. Intraplate volcanism and deformation. Internal structure of a strike-slip fault.

PROPOSED DRILLING SITES

Site Name	Latitude	Longitude	Water depth	Penetr. Sedim.	Penetr. Basem.	Comments
C1	14°40'N	66°05W	5100	2300	25	Soft upper Cretaceous to Quaternary except Eocene chert. Basalt.
	14°25'N	67°03'W	5000	2000	25	Soft upper Cretaceous to Quaternary except Eocene chert. Basalt.
C3	14°22'N	67°06'W	5000	1400	100	Soft upper Cretaceous to Quaternary except Eocene cherts. Basalt.
C4	14°30.5'N	69°27.5'W	4400	200	1600	Soft upper Cretaceous to Tertiary? Basalt and may be sediment interlayered.
C5	16°23'N	65°15'W	3750	500	25	Soft upper Cretaceous to Quaternary except Eocene cherts. Basalt.

ODP PROPOSAL LOG SHEET

407

JOIDES No: 382/A

Received: 5/90

General Title:
A Proposal for Drilling into Upper Mantle-Lower Crustal Uplifted Section at the Vema F.Z. in the Atlantic

Proponents:
E. Bonatti

Area: Atlantic ; Vema F.Z.

1st Submission:
Contact Acknow.:
E. Bonatti
Date acknow.:
5/90

Eval. Panels	Copied to
TECP	JOI
OHP	SS Databank
SGPP	Sci. Operator
LITHP	

Contact Proponent: Dr. E.Bonatti
Lamont-Doherty Geological Observ.
Columbia University Palisades
NY 10964 USA
Tel.: (914) 359-2900 Fax: 914-365 2312

Comments: New
Related to proposal 376/A

Objectives:
To study vertical variations of structure, geochemistry, and petrology of the lower crust and the upper mantle. To study vertical tectonic motions of blocks of oceanic lithosphere.

PROPOSED DRILLING SITES

Site Name	Latitude	Longitude	Water depth	Penetr. Sedim.	Penetr. Basem.	Comments
						NO PROPOSED SITE

ABSTRACT

Two major objectives can be addressed with a drilling program in the Vema F.Z. area, equatorial Atlantic. One objective is to core a thick vertical section of upper mantle and lower crust. This objective can be achieved by drilling into a relatively undisturbed upper lithospheric section (including a mantle peridotite unit, lower crustal gabbros, a dyke complex and pillow basalts) discovered by the submersible Nautile on the northern slope of the Vema transverse ridge. The second objective is to understand vertical motions of lithospheric blocks associated with slow-slipping transforms. This objective can be achieved by drilling through a reef limestone capping the summit of the Vema transverse ridge. The two objectives are conceptually related: understanding vertical motions would help interpret the mechanisms which have uplifted and exposed the lithospheric section.

ODP PROPOSAL LOG SHEET

408

JOIDES No: 383/A

Received: 5/90

Proponents:
K.A. Kastens, M.L. Myrianthis, G. Anastasakis

Title:
Case Study of Extension within a Continent-Continent Collision: Preliminary Proposal for ODP Drilling in the Aegean Sea.

Area: Atlantic ; Aegean Sea

1st Submission:
Contact Acknow.:
K.A. Kastens
Date acknow.:
5/90

Eval. Panels	Copied to
TECP	JOI
OHP	SS Databank
SGPP	Sci. Operator
LITHP	

Contact Proponent: Dr. K.A. Kastens
Lamont-Doherty Geological Obs.
Columbia University Palisades
N.Y. 10964 USA
Tel.: (914) 359-2900 Fax: (914) 365-0718

Comments: Preliminary
Preliminary proposal with three potential strategies for understanding the history of opening of this basin.

Objectives:
Triggering of the onset of the basin extension. Relationship between extension in the backarc and compression in the forearc region. Continental stretching in backarc: pure and/or simple shear. Amagmat. strectch. continen. crust to magm. seafl. spread.

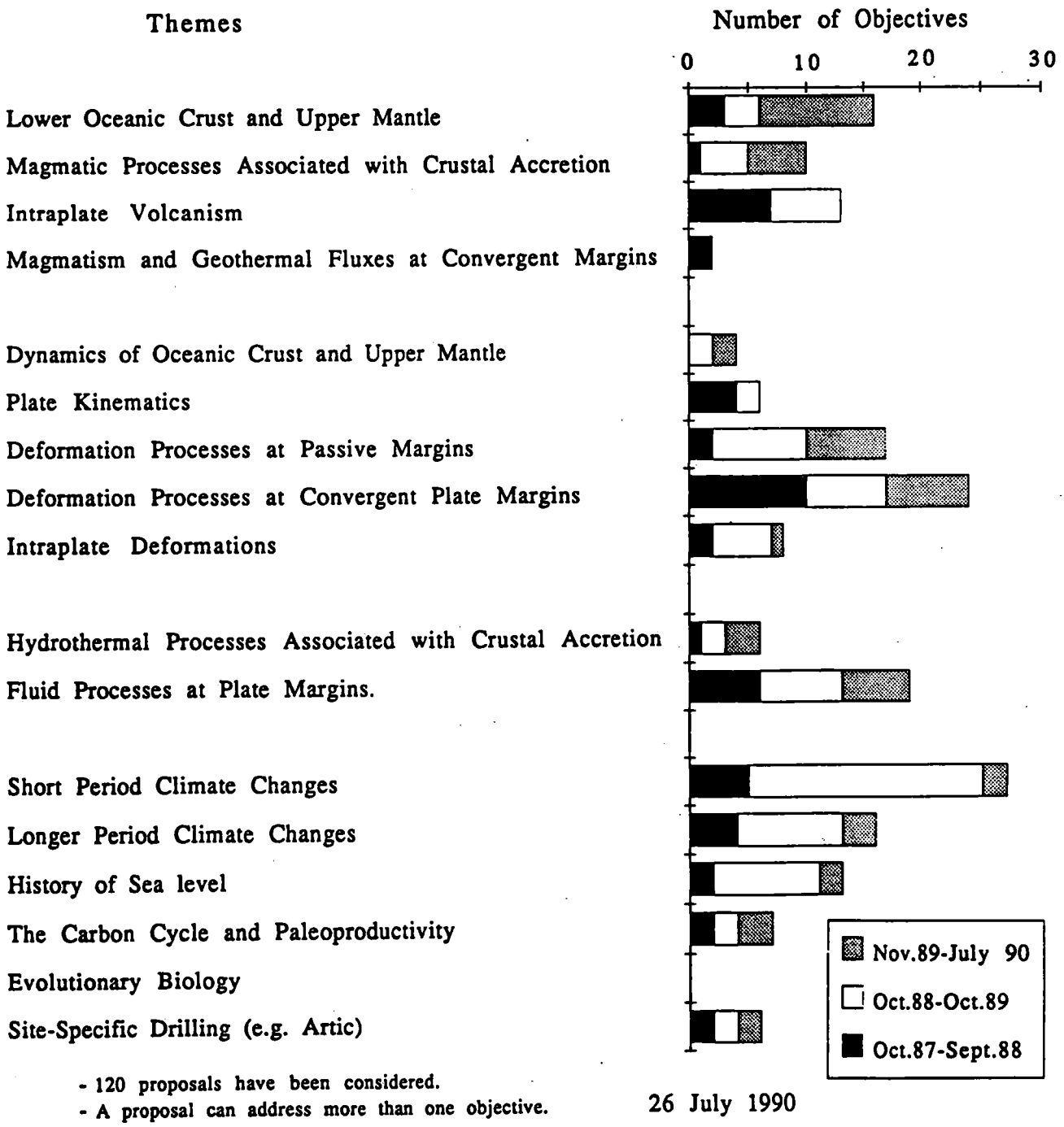
PROPOSED DRILLING SITES

Site Name	Latitude	Longitude	Water depth	Penetr. Sedim.	Penetr. Basem.	Comments
						NO PROPOSED SITE

ABSTRACT

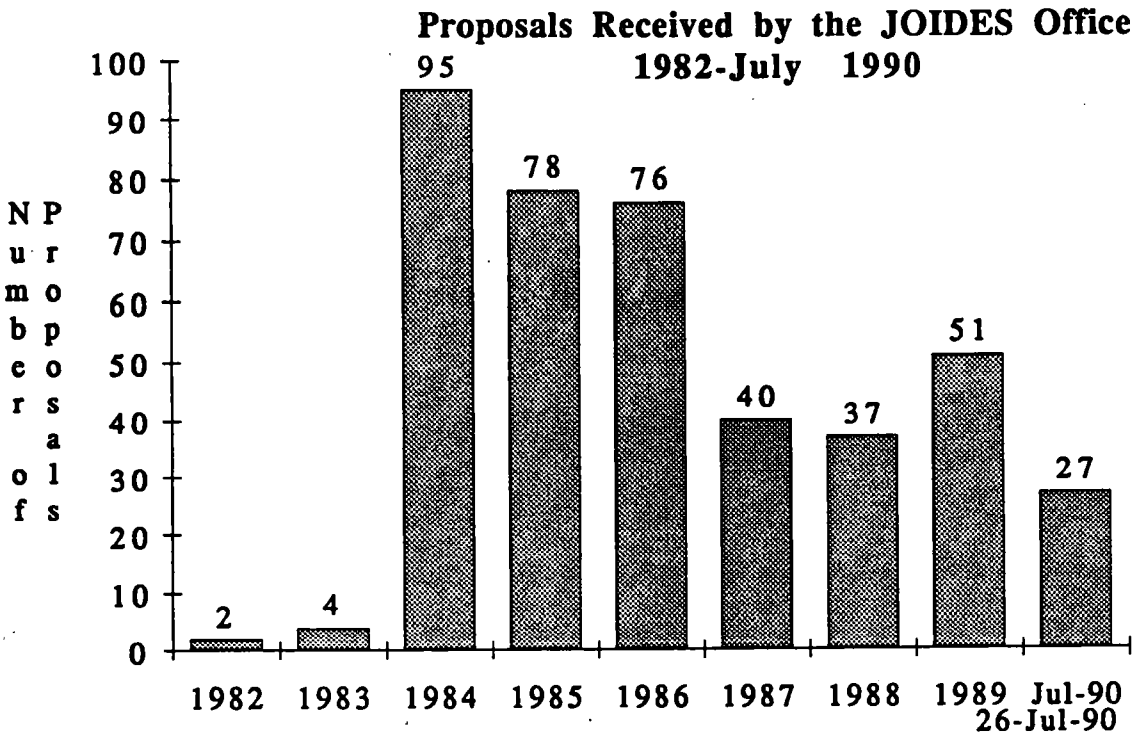
The Aegean Basin is a pocket of extensional tectonism within the overriding plate of a convergent plate margin which is on the threshold of a continent-continent collision. The authors believe that Aegean-style back-arc extension may be a common and even necessary feature of incipient continent-continent collisions, serving to consume oceanic remnants within embayments of the colliding continents. If this is the case, an understanding of the fundamental earth process of orogeny requires an understanding of these early -formed extensional basins. What triggers the onset of extension? What is the causal relationship between extension in the backarc and compression in the forearc? Is continental stretching in a back-arc setting dominated by pure or simple shear or a combination? How is the transition from amagmatic stretching of continental crust to magma-dominated seafloor spreading accomplished? The Aegean Basin is a particularly promising field area to attract these questions because active processes can be compared with the geological record; because the strengths of both land-based and seagoing techniques can be brought to bear; and because the stratigraphy control is superb. We offer three potential drilling strategies for understanding the history of opening of this basin: (1) a series of relatively shallow holes on tilted faults blocks to understand the timing and rates of subsidence and tilting, (2) a deep hole to penetrate a proposed detachment fault, and (3) a hole to sample early volcanic intrusions. The existing data set is sufficient to pose the problems and to extrapolate drilling results into a regional; however additional multichannel seismic and heatflow data will be needed to finalize a drilling strategy, to select specific sites, and to satisfy safety panel considerations.

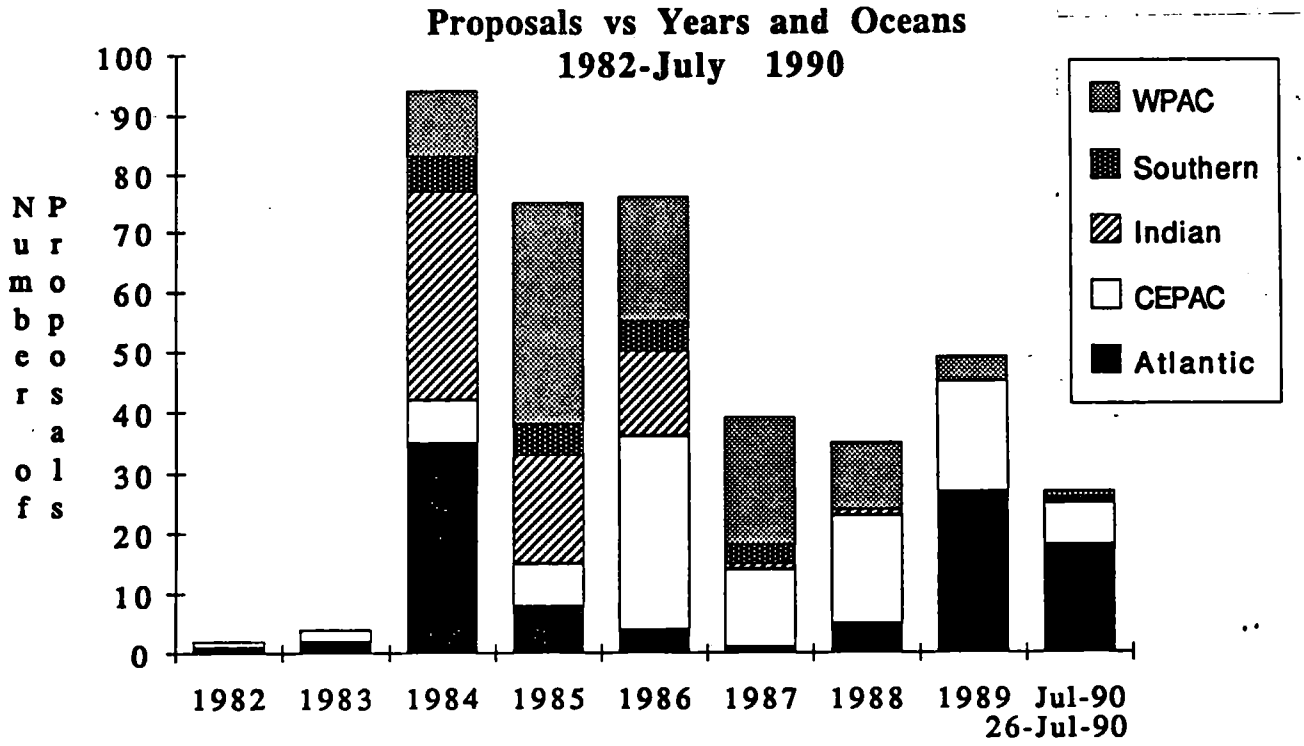
Objectives of Recent Proposals (October 1987 to July 1990) in Relation to Themes in the Long Range Plan



- 120 proposals have been considered.
- A proposal can address more than one objective.

26 July 1990


Proposals Received by the JOIDES Office
1982-July 1990
Number of Proposals
100
90
80
70
60
50
40
30
20
10
0
2
4
95
78
76
40
37
51
27
1982
1983
1984
1985
1986
1987
1988
1989
Jul-90
26-Jul-90


Proposals vs Years and Oceans
1982-July 1990
Number of Proposals
100
90
80
70
60
50
40
30
20
10
0
WPAC
Southern
Indian
CEPAC
Atlantic
1982
1983
1984
1985
1986
1987
1988
1989
Jul-90
26-Jul-90

LISTING OF PROPOSALS

Revised: 7/25/90

A: Atlantic; B: Indian; C: Southern; D: Western Pacific; E: Central and Eastern Pacific; F: Instrumental &Miscell.

JOIDES No	Title	Proponents	Country	Date
71	[idea proposal]	-	-	
1/A	Pre-m. Cretac. history of SE Gulf of Mexico	Phair & al.	US	12/82
2/E	Middle America trench and Costa Rica margin	Crowe & al.	US	12/82
4/E	Tuamoto Archipelago (French Polynesia)	Okal & al.	US	6/83
5/A	Struc. & sedim. carbonate platforms	Mullins & al.	US	7/83
7/A	Gulf of Mexico & Yucatan	Buffler & al.	US	8/83
8/E	Southern Chile trench	Cande	US	9/83
9/A	Pre-Messinian hist. of the Mediterranean	Hsu & al.	ESF	1/84
11/A	Porto & Virgo seamounts, Iberian margin	Kidd & al.	UK/FR	1/84
12/A	Tyrrhenian back-arc basin transect	Cita & al.	ESF	1/84
13/F	Water column research lab	Wiebe	US	1/84
14/E	Zero age drilling: EPR 13°N	Bougault	FR	1/84
15/A	Formation of the Atlantic Ocean	Herbin	FR	1/84
16/A	Atlantic-Mediterranean relationship	Faugeres	FR	1/84
17/A	Gorringe Bank, deep crust & mantle	Mevel	FR	1/84
19/A	Eleuthera fan, Bahamas	Ravenne & al.	FR	1/84
20/A	Subduction collision: Outher Hellenic Arc	J.Mascle	FR	1/84
22/A	Rhone deep sea fan	Bellaiche & al.	FR	1/84
23/A	Carribean basins	A.Mascle & al.	FR	1/84
24/A	Barbados transects	A.Mascle & al.	FR	1/84
25/D	New Hebrides arc	ORSTOM team	FR	1/84
28/D	South China Sea	Letouzey & al.	FR	1/84
29/D	Ryukyu Island & Okinawa backarc basin	Letouzey	FR	1/84
31/B	Red Sea, paleoenvironmental history	Guennoc	FR	1/84
32/A	Yucatan basin	Rosencrantz & al.	US	1/84
33/A	Mediterranean drilling [same as 9/A]	Hsu	ESF	1/84
35/A	Barbados ridge accretionary complex	Westbrook	UK	2/84
38/A	Gulf of Mexico (DeSoto Canyon)	Kennett & al.	US	2/84
39/A	Cape Verde drilling	Hill	UK	2/84
40/A	Logging of site 534 (Blake-Bahamas basins)	Sheridan & al.	US	2/84
34/E	Pacific-Aleutian-Bering Sea (Pac-A-Bers)	D.W. Scholl & al.	US	3/84
41/A	N Barbados forearc: Struc. & hydrology	C.Moore	FR/US	3/84
42/D	Sunda Straits area	Huchon	FR	3/84
43/D	SW Pacific drilling outline	Falvey	AUS	3/84
44/B	Andaman Sea: Tectonic evolution	Peltzer & al.	FR	3/84
45/A	Equatorian Atlantic: Paleoenvironment	Ruddiman	US	3/84
47/D	Manila trench, S.China Sea	Lewis & al.	US	3/84
49/D	Eastern Banda arc/Arafura Sea	Schluter & al.	G	3/84
52/D	Solomon Sea	Milsom	AUS	3/84
53/F	Vertical Seismic Profiling	Phillips & al.	US	3/84
54/C	Sub-Antarctic & Weddell Sea sites	Kennett	US	3/84
55/B	Makran forearc, Pakistan	Leggett	UK	3/84
57/B	Deformation of African-Arabian margin	Stein	US	3/84
58/A	West Baffin Bay	Grant & al.	CAN	3/84
59/A	Continental margin instability testing	Weaver & al.	UK	3/84
60/A	Newfoundland basin: E. Canadian margin	Masson	UK	4/84
6/A	Labrador Sea, ocean crust & paleoceanogr.	Gradstein & al.	CAN	5/84
36/A	Norwegian Sea	Hinz & al.	G	5/84
18/A	Off Galicia Bank	Mauffret & al.	FR	6/84
63/A	Madeira abyssal plain	E.J.T. Duin & al.	NETH	6/84
64/A	Site NJ-6	Poag	US	6/84
67/D	Tonga-Lord Howe Rise transect	Falvey & al.	AUS	7/84

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JOIDES No	Title	Proponents	Country	Date
68/A	Deep basins of the Mediterranean	L.Montadert	FR	7/84
69/F	Rock stress meas. in part of Norwegian Sea	Stephansson	ESF	7/84
70/F	Borehole seismic experim. at 417 & 603	Stephen & al.	US	7/84
72/A	Two-leg transect on Lesser Antilles forearc	Speed & al.	CONSOR.	7/84
37/E	Costa Rica, test of duplex model	Shipley & al.	US	8/84
74/A	Continental margin of Morocco, NW Africa	Winterer & al.	US	8/84
75/E	Gulf of California	K.Becker & al.	US	8/84
77/B	Seychelles bank & Amirante trough	Mart	US	8/84
78/B	Indus fan	Kolla	US	8/84
79/B	Tethyan stratigraphy & oceanic crust	Coffin & al.	US	8/84
81/A	Ionian Sea transect, Mediterranean	Hieke & al.	G	9/84
82/D	Sulu Sea	Thunell	US	9/84
84/E	Peru margin	Kulm & al.	US	9/84
85/A	Margin of Morocco, NW Africa	D.Hayes & al.	US	9/84
56/B	Intraplate deformation	Weissel et al.	US	10/84
61/B	Madagscar & E Africa conjugate margins	Coffin & al.	US	10/84
65/B	S. Australian margin: Magnetic quiet zone	Mutter & al.	US	10/84
80/D	Sunda & Banda arc	Karig & al.	US	10/84
87/B	Carlsberg Ridge, Arabian Sea: Basalt obj.	J.Natland	US	10/84
90/B	SE Indian Ocean Ridge transect	Duncan	US	10/84
91/B	SE Indian Ocean Oceanic Crust	Langmuir	US	10/84
93/B	W Arabian Sea: upwelling, salinity etc.	Prell	US	10/84
94/B	Owen Ridge: History of upwelling	Prell	US	10/84
95/B	Asian monsoon, Bay of Bengal	D.Cullen & al.	US	10/84
96/B	Bengal Fan (Indus & Ganges Fans)	Klein	US	10/84
98/B	History of atmosph. circ. (Austral. desert)	D.Rea	US	10/84
99/B	Agulhas Basin paleoceanogr. clim. dynamics	W.Coulbourn	US	10/84
100/B	SE Indian Ridge transect: Stratigr. section	J.Hays & al.	US	10/84
101/B	Ridge crest hydrothermal activity	Owen & al.	US	10/84
102/B	Somali Basin	Matthias	US	10/84
103/B	Laxmi Ridge, NW Indian Ocean	Heirtzler	US	10/84
104/B	90° E Ridge transect	Curray & al.	US	10/84
105/B	Timor, arc-continent collision	Karig	US	10/84
106/B	Broken Ridge, Indian Ocean	Curray & al.	US	10/84
107/B	SE Indian Ridge: Stress in ocean lithosph.	Forsyth	US	10/84
108/C	E. Antarctic continental margin (Prydz Bay)	SOP-Kennett	US	10/84
109/C	Kerguelen - Heard Plateau	SOP-Kennett	US	10/84
110/C	Wilkesland - Adelie continental margin	SOP-Kennett	US/FR	10/84
111/C	SE Indian Ocean Ridge transect (subantarc.)	SOP-Kennett	US	10/84
112/B	Lithosphere targets	SOP-Kennett	US	10/84
113/B	Agulhas Plateau	SOP-Kennett	?	10/84
114/C	Crozet Plateau	SOP-Kennett	FR	10/84
117/B	Northern Red Sea	Cochran	US	10/84
118/B	Cenozoic history of E. Africa	Kennett & al.	US	11/84
76/E	Proposal for axial drilling on the EPR at 13°N	R. Hekinian & al	FR	11/84
62/B	Davie Fracture Zone	Coffin & al.	CONSOR.	12/84
119/B	Early opening of Gulf of Aden	Stein	US	12/84
120/B	Red Sea, Atlantis II deep	Zierenberg & al.	US	12/84
122/A	Kane fracture zone	Karson	US	12/84
123/E	Studies at site 501/504	Mottl	US	12/84
124/E	To deepen Hole 504B	LITHP-K.Becker	US	1/85
125/A	Bare-rock drilling at the Mid-Atl. Ridge	Bryan & al.	US	1/85

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OIDES No	Title	Proponents	Country	Date
126/D	Drilling in the Australasian region	Crook & al.	AUS	1/85
127/D	E Sunda arc & NW Austral. collision	Reed & al.	US	1/85
128/F	Phys.props. in accretionary prisms	Karig	US	1/85
130/D	Evolution of the SW Pacific (N of New Zeal.)	J.Eade	NZ	1/85
131/D	Banda Sea basin: Trapped ocean crust etc.	Silver	US	3/85
132/D	TTT-Type triple junction off Bosco,Japan	Ogawa & al.	J	3/85
133/F	In-situ sampling of pore fluids	McDuff & al.	US	3/85
135/B	Broken Ridge: Thermo-Mechanical Models	Weissel & al.	US/UK	3/85
10/A	Cenozoic circulation off NW Afric	Samthein & al.	G/US	4/85
115/B	Agulhas Plateau and adj. basins	Herb & al.	ESF	4/85
116/B	E & Chagos-Laccadive Ridge drilling	Oberhansli & al.	ESF	4/85
142/E	Ontong-Java Pl.:Equat. Pacific depth trans.	L.Mayer & al.	CAN/US	4/85
88/B	Chagos-Laccadive-Mascarene volc. lineament	Duncan & al.	US	5/85
147/D	South China Sea	Wang & al.	CHINA	6/85
179/D	Daito ridges region: NW Philippines Sea	Tokuyama & al.	J	6/85
21/A	Thyrrenian Basin: Rifting, stretching,accr.	Rehault & al.	FR	7/85
51/D	Sea of Japan	Tamaki & al.	J	7/85
97/B	Equatorial Indian Ocean:Fertil.& carb.comp.	Peterson	US	7/85
136/C	Kerguelen - Heard Plateau	Schlich & al.	FR	7/85
146/D	Toyamu fan, E Japan Sea	Klein	US	7/85
150/B	90°E Ridge & Kerg.-Gaussb. Ridge: hard rock	Frey & al.	US	7/85
151/D	Japan Sea: Mantle plume origin	Wakita	J	7/85
152/F	Borehole seismic experim., Tyrrhenian Sea	Avedik & al.	FR	7/85
153/E	Three sites in the SE Pacific	J.Hays	US	7/85
154/D	Banda-Celebes-Sulu basin entrapment	Hilde	US	7/85
156/D	Kita-Yamam. trough, Japan Sea: Massive sulf.	Urabe	J	7/85
157/D	Japan Sea paleoceanography	Koizumi & al.	J	7/85
158/D	Japan Sea & trench: Geochem & sedimentol.	Matsumoto & al.	J	7/85
159/F	Phys.cond. across trench: Izu-Mariana-...	Kinoshita & al.	J	7/85
160/F	Geophys. cond. of lithosp. plate, Weddell Sea	Kinoshita & al.	J	7/85
161/F	Magn.field & water flow measurement	Kinoshita & al.	J	7/85
162/F	Offset VSP on the SW IO Ridge fract.zones	Stephen	US	7/85
164/D	Japan trench & Japan-Kuril trenches juntion	Jolivet & al.	FR	7/85
165/D	Shikoku basin ocean crust	Chamot-Rooke & al.	FR	7/85
166/D	Japan Sea: Evolution of the mantle wedge	Tatsumi & al.	J	7/85
168/D	Japan Sea: Sedim. of siliceous sediments	Iijima & al.	J	7/85
169/C	South Tasman Rise	Hinz & al.	G	7/85
170/D	Valu Fa Ridge, Lau Basin: Back-arc spread.	Morton & al.	US	7/85
30/B	Davie Ridge & Malagasy margin, Indian Ocean	Clocchiatti & al.	FR	8/85
50/D	Nankai trough & Shikoku forearc	Kagami & al.	J	8/85
73/C	Antarctic margin off Adelie coast	Wannesson & al.	FR	8/85
92/B	Crozet Basin, seismic observatory	Butler & al.	US	8/85
137/B	Fossil ridges in the Indian Ocean	Schlich & al.	FR	8/85
138/B	Rodrigues triple junction, Indian Ocean	Schlich & al.	FR	8/85
139/B	Agulhas Plateau, SW Indian Ocean	Jacquart & al.	FR	8/85
140/B	Central & N. Red Sea axial areas	Pautot & al.	FR	8/85
141/B	Indus Fan	Jacquart & al.	FR	8/85
172/D	Mariana forearc, arc & back-arc basin	P.Fryer	US	8/85
173/B	Seychelles, Mascarene Pl., NW Indian Ocean	Patriat & al.	FR	8/85
174/D	Japan Sea: Forearc tectonics	Otsuki	J	8/85
175/D	Japan Trench: Origin of Inner Wall	Niitsuma & al.	J	8/85
176/D	S.Japan Trench: Migration of Triple Junction	Niitsuma	J	8/85

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JOIDES No	Title	Proponents	Country	Date
178/D	Nankai trough forearc	Shiki & al.	J	8/85
180/D	N.Philippines Sea: Kita-Amami basin & plat.	Shiki	J	8/85
181/D	Izu-Ogasaw.-Mariana forearc:Crust & mantle	Ishii	J	8/85
182/E	Sounder Ridge,Bering Sea: Stratigraphy	A. Taira	J	8/85
184/D	Papua New Guinea/Bismark Sea Region	N.Exon & al.	AUS/US	8/85
185/C	Kerguelen Plateau: Origin, evol. & paleo.	Coffin & al.	AUS	8/85
186/F	SW Ind.Ocean fracture zones hydrology etc.	von Herzen	US	8/85
86/B	Red Sea	Bonatti	US	9/85
187/D	New Hebrides arc region, SW Pacific	F.Taylor & al.	US	9/85
188/F	395A boreh.geophys. & 418A drill.& geophysics	M.Salisbury	CAN	9/85
189/D	Tonga Ridge and Lau Ridge Region	A.Stevenson & al.	US	10/85
191/D	Solomon Isl.: Arc-plateau coll. & intra arc	Vedder & al.	US	10/85
192/E	Baranoff fan, SE Gulf of Alaska	Stevenson & al.	US	10/85
193/F	Upper ocean partic.fluxes in Weddell Sea	Biggs	US	11/85
3/E Rev/1	Flexural moat, Hawaiian Islands	A.B. Watts & al	US	11/85
143/F	In-situ magnet. susc. measurements	Krammer & al.	G	12/85
195/E	Paleoenv. & Paleoclim. in the Bering Sea	C. Sancetta & al.	US	12/85
196/B	90°E Ridge: Impact of India on Asia	J.Peirce	CAN	12/85
197/B	Otway Basin/W.Tasman region	Wilcox & al.	AUS	12/85
198/D	Ulleung Basin: Neogene tectonics & sedim.	Chough & al.	COREA	12/85
199/E	Pelagic sediments in the sub Artic gyre (N.Pacific)	T.R. Janecek & al.	US	12/85
200/F	Borehole magnet. logging on leg 109 (MARK)	Bosum	G	12/85
201/F	High-precision borehole temp. measurements	Kopietz	G	12/85
205/A	Bahamas: Carb.fans, escarpm.erosion & roots	Schlager & al.	ESF	12/85
202/E	N.Marshall Isl. carbonate banks	S.O. Schlanger	US	1/86
203/E	Guyots in the central Pacific	E.L. Winterer & al.	US	1/86
207/E	Bering Sea basin & Aleutian ridge tectonics	Rubenstone	US	1/86
208/B	Ancestral triple junction, Indian Ocean	Natland & al.	US	1/86
209/C	Eltanin fracture zone	Dunn	US	1/86
210/E	NE Gulf of Alaska: Yakutat cont. margin	Lagoe & al.	US	1/86
211/B	Deep stratigraphic tests	SOHP -Arthur	US	1/86
212/E	Off northern & central California	Greene	US	1/86
213/E	Aleutian subduction: accret. controlling p.	McCarthy & al.	US	1/86
214/E	Central Aleutian forearc:Trench-slope break	Ryan & al.	US	1/86
215/B	Red Sea: Sedim. & paleoceanogr. history	Richardson & al.	US	2/86
216/D	South China Sea	Rangin & al.	FR	2/86
217/D	Lord Howe Rise	Mauffret & al.	FR	2/86
218/D	Manila trench & Taiwan collis.zone, SCS	Lewis & al.	US	2/86
219/B	Gulf of Aden evolution	Simpson	UK	3/86
220/D	Three sites in the Lau Basin	J. Hawkins	US	3/86
222/E	Ontong-Java Pl.: Origin, sedim. & tectonics	Kroenke & al.	US	3/86
221/E	Equatorial Pacific: late Cenoz. Paleoenv.	N.G. Pisias	US	3/86
83/D	Izu-Ogasawara (Bonin) arc transect	Okada & al.	J	4/86
134/B	Gulf of Aden	Girdler	UK	4/86
171/D	Bonin region: Intra-oceanic arc-trench dev.	B.Taylor	US	4/86
223/B	Central Indian Ocean fracture zone	Natland & al.	US	4/86
225/E	Aleutian Basin, Bering Sea	A.K.Cooper & al.	US	4/86
224/E	Escanaba Trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	4/86
89/B	SWIR, mantle heterogeneity	Dick & al.	US	5/86
121/B	Exmouth & Wallaby Pl. & Argo Abyssal Plain	U.von Rad & al.	G/AUS	5/86
129/C	Bounty trough	Davey	NZ	5/86
227/E	Aleutian Ridge, subsidence and fragment.	Vallier & al.	US	5/86

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OIDES No	Title	Proponents	Country	Date
228/C	Weddell Sea (E Antarctic contin. margin)	Hinz & al.	G	5/86
229/E	Bering sea, Beringian conti. slope & rise	A.K. Cooper & al.	US	5/86
230/C	Wilkes Land margin, E Antarctica	Eittreim & al.	US/J	5/86
231/E	North Pacific magnetic quiet zone	Mammerickx & al.	US	5/86
232/E	N.Juan de Fuca R.: High temp.zero age crust	E.Davis & al.	CAN	5/86
26/D	Tonga-Kermadec arc	Pelletier & al.	FR	6/86
144/D	Kuril forearc off Hokkaido: Arc-arc collis.	Seno & al.	J	6/86
145/D	Ryukyu arc: Left-lateral dislocation	Ujiie	J	6/86
148/D	Near TTT-type triple junction off Japan	Ogawa et al.	J	6/86
149/D	Yamoto Basin,Sea of Japan: Active Spreading	Kimura & al.	J	6/86
167/D	Okinawa trough & Ryukyu trench	Uyeda & al.	J	6/86
234/E	Aleutian trench: Kinematics of plate cover.	von Huene & al.	US	6/86
235/D	Solomon Sea: Arc-trench dev., back-arc...	Honza & al.	CONSOR.	6/86
236/E	N.Gulf of Alaska	Bruns & al.	US	6/86
237/E	Active margin off Vancouver Isl., NE Pac.	Brandon & al.	CAN/US	6/86
238/F	Pore pressure in the Makran subduction z.	Wang & al.	US	6/86
239/D	Two sites in the Lau Basin	D.Cronan	UK	6/86
241/E	Gulf of Alaska (Yakutat block) & Zodiak fan	Heller	US	6/86
243/D	Outer Tonga trench	Bloomer & al.	US	6/86
240/B	Argo abyssal Plain	Gradstein	CONSOR.	7/86
245/E	Transform margin of California	Howell & al.	US	7/86
246/B	Mesozoic upwelling off the S.Arabian margin	Jansa	CAN	7/86
247/E	NE Pacific: Oceanogr.,climatic & volc. evol.	D. Rea & al.	US/CAN	7/86
226/B	Equat.Indian Ocean: carb. system & circul.	Prell & al.	US	8/86
244/C	Western Ross Sea	Cooper & al.	US/NZ	8/86
248/E	Ontong-Java Plateau	Ben-Avraham & al.	US	8/86
249/E	Sedimentation in the Aleutian trench	M.B. Underwood	US	8/86
250/E	Navy fan, California borderland	M.B. Underwood	US	8/86
251/B	Seychelles-Mascarene-Saya de Mayha region	S.N. Khanna	SEYCH.	8/86
253/E	Shatsky Rise:Black shales in ancestr. Pac.	S.O. Schlanger & al.	US	8/86
254/A	NW Africa: Black shales in pelagic realm	Parrish & al.	US	8/86
255/A	Black shales in the Gulf of Guinea	Herbin & al.	FR/US	8/86
256/E	Queen Charlotte Transform fault	Hyndman & al.	CAN	9/86
257/E	Farallon Basin, Gulf of California	L. Lawver & al.	US	9/86
204/A	Florida escarpment transect	Paull & al.	US	10/86
252/E Rev.	Loihi Seamount, Hawaii	H. Staudigel & al.	US	10/86
258/E	Stockwork zone on Galapagos Ridge	R. Embley & al	US	10/86
260/D	Ogasawara Plateau, near Bonin arc	T. Saito & al.	J	10/86
261/E	Mesozoic Pacific Ocean	R.L. Larson & al.	US/FR	10/86
262/B	Mid Indus Fan	B.Haq	US	11/86
263/E	S.Explorer Ridge, NE Pacific	R.L. Chase & al.	CAN	11/86
206/D	Great Barrier R.: Mixed carb/epiclast.shelf	Davies & al.	AUS	12/86
264/A	Montagnais impact struct.,Scotia Sh.	Grieve & al.	US	12/86
265/D	Western Woodlark Basin	S.D. Scott & al.	CAN/AUS/PNG	12/86
266/D	Lau Basin	Lau Group	CONSOR.	12/86
267/F	Old crust at converg. margins: Argo & W.Pac	C.H. Langmuir & al	US	12/86
268/D	Hydrothermal ore deposition, Queensland Pl.	Jansa et al.	CAN	12/86
269/E	Aleutian pyroclastic flows in marine envir.	Stix	CAN	12/86
27/D Rev.	Sulu Sea marginal basin	Cl. Rangin & al	FR	1/87
48/D Add.	Sulu Sea transect	Cl. Rangin	G/FR	1/87
270/F	Tomographic imaging of hydrotherm. circul.	Nobes	CAN	1/87
271/E	Paleoceanogr. trans. of California current	Barron & al.	US	2/87

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JOIDES No	Title	Proponents	Country	Date
272/F	Long-term downh. measurem.in seas a. Japan	Kinoshita	J	2/87
183/B	Periplatform ooze, Maldives, Indian Ocean	Droxler & al.	US	3/87
259/E Rev.	Meiji sediment drift, NE Pacific	L.D. Keigwin	US	3/87
274/D	South China Sea	Zaoshu & al.	CHINA	3/87
275/E	Gulf of California (composite proposal)	Simoneit & al.	US	3/87
232/E Add.	Clay miner. & geoch.: Juan de Fuca Ridge	B. Blaise & al.	CAN/FR	3/87
276/A	Equat. Atlantic transform margins	J.Mascle	FR	4/87
277/E	Aseismic slip in the Cascadia margin	Brandon	US	4/87
278/E	Blanco transf. fault: Alter., layer three.	R. Hart & al	US	5/87
279/E	Anatomy of a seamount: Seamount 6 near EPR	R.Batiza	US	5/87
280/E	Cretac.Geisha Seamounts & guyots, W-Pac	P.R. Vogt et al.	US	6/87
281/D	Accret.prisms at Kuril/Japan trench&Nankai Tr.	Y. Okumura & al.	J	6/87
282/E	Tracing the Hawaiian hotspot.	N. Niitsuma & al.	J	6/87
283/E	Kuroshio current and plate motion history	R.D.Jacobi & al.	US	6/87
284/E	Escanaba Trough, S-Gorda Ridge Hydroth.	Zierenberg & al.	US	7/87
285/E	Jurassic quiet zone ,Western Pacific	Handschumacher & al.	US	7/87
286/E	Return to 504/B to core & log layer 2/3 trans.	K.Becker	US	7/87
287/E	Deep drilling in the M-Series,Western Pacific	Handschumacher & al.	US	8/87
288/B	Repositioning of EP2 to EP12,Exmouth Plateau	Mutter & al.	US	8/87
289/E	Mass budget in Japan Arc-10Be Geochemical Ref.	S. Sacks & al.	US/J	8/87
66/F Rev.	Laboratory rock studies to reveal stress	N.R. Brereton	UK	9/87
76/E Rev.	EPR: oceanic crust at the axis	R. Hekinian	FR	9/87
177/D Rev.	Zenisu Ridge: Intra-oceanic plate shortening	A. Taira & al.	J/FR	9/87
224/E Rev.	Escanaba trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	9/87
242/D	Backthrusting & back arc thrust., Sunda arc	Silver & al.	US	9/87
290/E	Axial Seamount, Juan de Fuca Ridge	P.Johnson & al.	US	9/87
291/E	Drilling in the Marquesas Islands chain.	J.H. Natland & al.	US	9/87
292/D	Drilling in the SE Sulu Sea	Hinz & al.	G	9/87
293/D	Drilling in the Celebes Sea	K. Hinz & al.	G	9/87
155/F Rev/1	Downhole measurt.in the Japan Sea	T. Suyehiro & al	J	9/87
294/D	Ophiolite analogues in the Aoba Basin,Vanuatu	J.W.Shervais	US	10/87
46/D	South China Sea margin history	D.Hayes & al.	US	11/87
273/C	Southern Kerguelen Plateau	Schlich et al.	FR/AUS	11/87
295/D	Hydrogeol.& structure,Nankai accr.complex	J.M. Gieskes & al.	US	12/87
296/C	Ross Sea, Antarctica	Cooper & al.	US/NZ/G	12/87
297/C	Pacific Margin of Antartic Peninsula	P.F. Barker	UK	12/87
247/E Rev.	NE Pacific: Oceanogr.,climatic & volc.evol.	B.D. Bornhold	CAN/US	1/88
298/F	Vertical seismic prof. in Nankai Tr. ODP Sites	G.F. Moore	US	1/88
299/F	Self-bor. p-meter: study deform.in accr. sed.	M.Brandon & al.	US/CAN	2/88
300/B	Return to site 735B-SW Indian Ridge	H. Dick & al.	US/CAN	2/88
301/D	Integrated proposal: Nankai forearc	J.Gieskes & al.	US/J	3/88
302/F	Electrical conductivity structure,E-Japan Sea	Y.Hamano & al.	J	3/88
194/D Rev/2	South China Sea	K.J. Hsü & al.	CHINA	4/88
303/E	Fracturing /volcanism on Hawaiian swell	B.Keating	US	4/88
190/D Add.	New Hebrides (Vanuatu) arc-ridge collision	Fisher & al.	US/FR	5/88
163/D Rev.	Zenisu Ridge: Intraplate deformation	S. Lallemant & al	FR	6/88
221/E Suppl.	Equatorial Pacific: L.Cenozoic paleoenviron.	N. Pisias & al.	US	6/88
304/F	ODP Nankai downhole observatory	H.Kinoshita & al.	J	6/88
305/F	Artic Ocean drilling	P.J. Mudie & al.	CAN	6/88
306/E	Old Pacific History	Y.Lancelot & al.	FR/US	6/88
233/E Rev.	Oregon accr. complex: fluid proc. & struct.	L.D. Kulm & al.	US	7/88
307/E	Cross Seamount, Hawaiian swell	B. Keating	US	7/88

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308/E	Reactivated Seamounts,Line Island chain.	B.Keating	US	7/88
3/E Add.	Drilling in vicinity of Hawaiian Islands	R.S.Detrick & al	US	7/88
222/E Rev.	Ontong Java Pl.: origin, sedim. & tectonics.	J. Mahoney & al.	US	7/88
155/F Rev/2	Downhole measurement in the Japan Sea	T. Suyehiro & al	J	8/88
309/F	VSP Program at sites Bon-2 and Bon-1	P.Cooper	US	9/88
310/A	Geochemical sampling ,dippings ,E-Groenland	A.Morton & al.	UK	9/88
311/A	Sedim. equivalent of dippings ,Rockall	D.Masson & al.	UK	9/88
312/A	Potential of drilling on Reykjanes Ridge	J.Cann & al.	UK	9/88
313/A	Evolution of oceanog. pathway: The Equat. Atlan.	E.Jones & al.	UK	9/88
314/D	Fluid flow & mechan. response, Nankai	D.Karig & al.	US	9/88
316/E	To drill a gaz-hydrate hole (West Pacific)	R. Hesse & al.	CONSOR.	9/88
59/A Rev.	Continental margin sediment instability	P.P.E.Weaver & al	UK/NETH/CAN	9/88
3/E Rev/2	Flexural moats, Hawaiian Islands	A.B. Watts & al.	US	10/88
315/F	Network of perm. ocean floor broad band seism.	G.M. Purdy & al.	US	10/88
275/E Rev.	Drilling the Gulf of California	Simoneit (ed.) & al	US	10/88
271/E Rev.	Paleocean. transect of California current	J.A. Barron & al	US	10/88
195/E Suppl.	Paleoenviron. and paleoclim. in the Bering Sea	D.W. Scholl & al	US	10/88
199/E Suppl.	High latitude paleoceanography	D.W. Scholl & al	US	10/88
231/E Suppl.	Plate reconstr. & Hawaiian hotpsot fixity.	D.W. Scholl	US	10/88
225/E Suppl.	Plate-Reconstr.: Bering Sea	D.W. Scholl & al.	US	10/88
317/E Rev.	Northern Cascadian Subduction Zone	R.D.Hyndman & al.	CAN	12/88
318/E Rev.	Chile Margin Triple Junction	S.C.Cande & al	US	1/89
319/E Rev.	An extinct hydrotherm. syst., East Galapagos	M.R. Perfit & al	US/CAN	2/89
320/A	High Northern latitude paleoceano. & paleoclim.	E. Jansen & al	NOR/SWED.	3/89
321/E	The EPR ridge crest near 9°40' N	D.J. Fornari & al	US	3/89
322/E	Ontong Java Plateau-pipelike structures.	P.H. Nixon	UK	3/89
323/A	Gibraltar Arc	M.C. Comas & al	CONSOR	4/89
324/A	Tecton. evol. of W. & E. Mediterr. since Mesozoic	P. Casero & al.	IT/G	4/89
142/E Rev.	The Ontong Java Plateau	L. Mayer & al.	CAN/US/UK	4/89
325/E	High temp. hydrother. site N. Juan de Fuca Ridge	H.P. Johnson & al	US/CAN/UK	5/89
326/A	Continenetal margin of Northwest Morocco	K. Hinz & al	G	5/89
327/A	Argentine continental rise	K. Hinz & al	G/ARG	5/89
203/E Rev.	Cretaceous guyots in the Northwest Pacific	E. L. Winterer & al	US	5/89
328/A	Continental margin of East Greenland	K. Hinz & al	G	6/89
329/A Rev.	Paleocommunication between N & S Atlantic	J.P. Herbin & al.	FR	7/89
330/A	Mediterranean ridge, accretionary prism	M.B. Cita & al.	I/G	7/89
331/A	"Zero-age" drilling: Aegir ridge	R.B. Whitmarsh & al.	UK/G/FR	7/89
332/A	Florida escarpment drilling transect	C.K. Paull & al.	US	7/89
333/A	Tectonic and magmatic evolution: Carribean sea	Mercier de Lepinay &al.	FR/US	7/89
334/A	The Galicia margin new challenge	G. Boillot & al.	FR/SP	7/89
335/E Rev.	Drowned atolls of the Marshall Islands.	S.O. Schlanger & al.	US	7/89
336/A	Artic to north Atantic gateways	J. Thiede	G	7/89
337/D	To test the sedim. architect. Exxon sea-level curve	R.M. Carter & al.	A/NZ/US	7/89
338/D	Neogene sea-level fluctuations: NE Australia	C.J. Pigram & al.	A	8/89
339/A	Drilling transects of the Benguela current	L. Diester-Haass & al.	G/US	8/89
340/D	Evolution of foreland basins: N. Australia	M. Apthorpe & al.	A	8/89
341/A	Global climatic change-Holocene	J.P.M. Syvitski	CAN	8/89
342/A	The Barbados accretionary prism	R.C. Speed & al.	US/UK/FR	8/89
343/A	Drill in window Cret. volc. form. Caribbean	A. Mauffret & al.	FR	8/89
344/A	Western N. Atl. Jurassic magnetic quiet zone	R.E. Sheridan	US	8/89
345/A	Sea level and paleoclim. West Florida margin	J.E. Joyce & al.	US	8/89
346/A Rev.	The Equatorial Atlantic transform margin	J.Mascle & al.	FR	8/89

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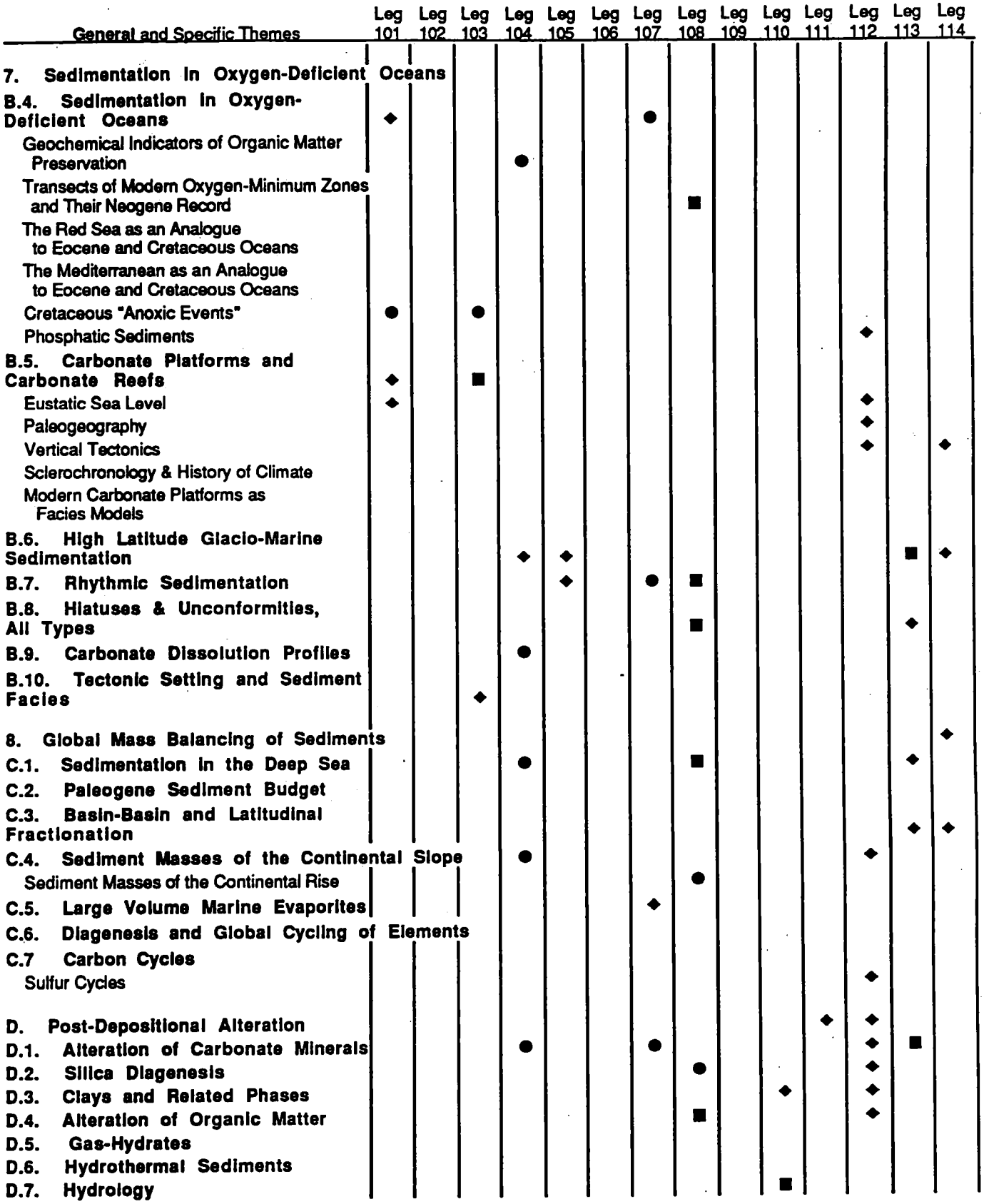
347/A	Late Cenozoic paleocean., S.Equat.Atlantic	G. Wefer & al.	G/US	8/89
348/A	Upper Paleoc. to Neog. sequence: mid Atl. margin	K.G. Miller & al.	US	8/89
349/A	Clastic apron of Gran Canaria.	H.-U. Schmincke & al.	G/US/UK	8/89
350/E	Gorda deformation zone off N. Calif.	M. Lyle & al.	US	9/89
351/C	Bransfield Strait	D.C. Storey & al.	UK/US/G	9/89
352/E	Drilling into Layer 3, Mathemat. Ridge	D.S. Stakes & al.	US	9/89
353/C Rev.	Antarctic Peninsula, Pac. margin	P.F. Barker & al.	UK	9/89
354/A	Angola/Namibia upwelling system	G. Wefer & al.	G/US	9/89
355/E	Formation of a gaz hydrate	R. von Huene & al.	G/US	9/89
271/E Rev/2	APC coring seamounts off California.	J. Barron	US	9/89
233/E Rev/2	Oregon accretionary complex	L.D. Kulm & al.	US/G	9/89
356/A	Denmark Str.,Greenl. Scotl.&Jan Mayen ridges	P.P. Smolka & al.	G	9/89
357/E Rev.	East Pacific Rise near 12°50'	R. Hékinian & al.	FR/US	10/89
286/E Add.	Layer 2/3 transition at hole 504B	K. Becker	US	10/89
355/E Rev.	Formation of a gaz hydrate	R. von Huene & al.	G/US	10/89
221/E Add.	Eastern Equatorial Pacific Neogene	N.G. Pisias & al.	US	11/89
317/E Add.	Northern Cascadia subduction zone	R.D. Hyndman & al.	CAN	11/89
358/A	To drill a transect at the Vøring margin	O. Eldholm & al.	NOR	11/89
359/A	North Atlan. conjug. passive margin	B. Tuchloke & al.	US/CAN/FR	11/89
360/D	Valu Fa Ridge (Southern Lau Basin)	U. von Stackelberg & al	G	12/89
361/A	Active Hydrotherm. Mid-Atlantic Ridge	G. Thompson & al.	US /UK	1/90
362/E Rev.	Chile margin triple junction	S.C. Cande & al.	US/UK	1/90
363/A	Plume volcanism: Grand Banks - Iberia separation	B.E. Tucholke & al.	US/CAN	1/90
364/A	Thrust units of contin. basement: central Mediter.	R. Sartori & al.	I/FR	1/90
330/A Add.	Mediterranean ridge, accretionary prism	M. Cita & al.	I/G	1/90
365/A	Conjugate passive margin - N.Atlantic	J. Austin & al.	US/CAN/FR	1/90
366/A	Labrador - Greenland (Preliminary)	M.H. Salisbury	CAN	1/90
367/C	Cool water carbonate margin: S. Australia	N.P. James	CAN	2/90
368/E	Jurassic Pacific crust: return to 801C	R.L. Larson & al.	US/UK	2/90
369/A	A deep mantle section in the Mark area	C. Mevel & al.	FR	2/90
370/A	Magmatic proces. & natur. tracers: Oceanogr. FZ	H.J.B. Dick & al.	US/CAN	2/90
371/E	To drill the Nova-Canton Trough	K. Becker & al.	US	2/90
372/A	Water circul. & vertical chemi. gradients Cenozoic	R. Zahn	CAN	2/90
373/E	Revisiting Site 505	M.D. Zoback & al.	US	3/90
374/A	Mantle heterogeneity Oceano. Fracture Zone	H.J.B. Dick & al.	US	3/90
375/E	Deep crustal drilling: Hess Deep	H.J.B. Dick & al.	US	3/90
376/A	Layer 2/3 boundary: Vema fracture zone	J.M. Auzende & al.	FR	3/90
377/F Rev.	Global network ocean floor seismometers	G.M. Purdy & al.	US	3/90
378/A Rev.	Barbados accretionary wedge	R.C. Speed & al.	US/UK/FR	3/90
379/A	Scientific drilling Mediterranean Sea	J. Mascle	FR	3/90
380/A Rev.	Clastic apron of Gran Canaria	H.-U. Schmincke & al.	G	3/90
381/A	Continental shelf and slope of Argentina	B.T. Huber	US	3/90
382/A	Upper mantle-lower crust: Vema F.Z.	E. Bonatti	US	5/90
383/A	Aegean sea: continent-continent collision	K.A. Kastens & al.	US/ESF	5/90
317/E Add/2	Seafloor bottom simulating reflectors: N. Cascadia	R.D. Hyndman	US	6/90
265/D Add.	Western Woodlark basin	S.D. Scott & al.	CAN/AUS/PNG	6/90
384/A Rev.	Venezuela basin and Aruba Gap.	A. Mauffret & al.	FR/US	7/90

EVALUATION OF DRILLING RESULTS IN TERMS OF COSOD I OBJECTIVES

▼=proposed, not achieved; ■=proposed, partially achieved; ◆=proposed & achieved; ●=achieved but not proposed;

General and Specific Themes	Leg 101	Leg 102	Leg 103	Leg 104	Leg 105	Leg 106	Leg 107	Leg 108	Leg 109	Leg 110	Leg 111	Leg 112	Leg 113	Leg 114
ORIGIN AND EVOLUTION OF THE OCEANIC CRUST														
1. Processes of Magma Generation and Crustal Construction at MORs		■												
Spacing of Submarine Eruptions		▼				▼								
Periodicity of Submarine Eruptions		▼				▼								
Volume of Submarine Eruptions						▼								
2. Configuration, Chemistry and Dynamics of Hydrothermal Systems														
Formation of Ore Deposits on Crust						●								
Formation of Ore Deposits Within Crust														
Physico-Chemical Distribution of Alteration in Crust in Time						■			■					
Physico-Chemical Distribution of Alteration in Crust in Space						■			■					
Relationship Between Hydrothermal Activity and Physical State of the Crust						■			■					
Relationship between Hydrothermal Alteration and Volcanism						■								
B.2.a. Compositional Heterogeneity of the Mantle						■								
Mantle Evolution			■											
Origin of Structural Complexity of MORs									■					
B.2.b. Aging of the Crust		◆				●								
Evolution of the Crust		◆		◆					■					
B.2.c. Formation of Overly Thick Crust & Flood-Type Volcanism				■										
B.2.d. Structure of Transform Faults						▼								
Petrology of Transform Faults						▼								
Geochemistry of Transform Faults						▼								
Fracture Zone Offsets						▼								
B.2.e. Processes Operating in Young Ocean Basins							◆							
Initiation of Rifting				◆			◆							
B.2.f. Island Arcs and Backarc Basins							◆							
TECTONIC EVOLUTION OF CONTINENTAL MARGINS AND OCEANIC CRUST														
B.1. Dynamics of Magma Chambers and the Formation of the Oceanic Crust														
Problems of Magma Chambers									◆					
Problems of Magma Migration														
B.2. Hydrothermal Circulation at MORs														
B.3. Composition and Structure of the Lower Oceanic Crust and Upper Mantle														
Lower Two-Thirds of Layer 2		◆							◆		■			
Nature of the Layer 2/3 Boundary														
Upper Portion of Layer 3														
Validity of the Ophiolite Analogy														

General and Specific Themes	Leg 101	Leg 102	Leg 103	Leg 104	Leg 105	Leg 106	Leg 107	Leg 108	Leg 109	Leg 110	Leg 111	Leg 112	Leg 113	Leg 114
B.4. Transform Faults														
Structure of Transform Faults						▼								
Petrology of Transform Faults						▼								
Fracture Zone Offsets						▼								
Geochemistry of Transform Faults						▼								
B.5. Oceanic Plateaus & Aseismic Ridges														
Crustal Structure of Oceanic Plateaus														
Origin of Oceanic Plateaus														
Tectonic Evolution of Oceanic Plateaus														
Crustal Structure of Aseismic Ridges														
Origin of Aseismic Ridges														
Tectonic Evolution of Aseismic Ridges														
B.6. Origin of Intraplate Volcanism														
3. Early Rifting History of Passive Continental Margins			◆	◆	◆								▼	
C.1. Detailed History of Vertical Movements at Passive Margins			◆	◆	◆		◆						▼	
Evolution of Passive Continental Margins			■	◆			◆						▼	
C.2. Deep Crustal Structure			▼											
C.3. Thermal and Mechanical Evolution			■	■			■							
C.4. "Global" Unconformities and the Synchroneity of Tectonic & Sea-Level Events				◆										
4. Dynamics of Forearc Evolution														
D.1. Structure and Evolution of Forearc Regions										◆		◆		
D.3. The Detailed History of Vertical Movements of the Forearc										◆		◆		
5. Structure and Volcanic History of Island Arcs										◆				
D.2. Tectonic Evolution of Back-Arc Basins							◆							
D.4. Stress Field at Active Margins										◆				
ORIGIN AND EVOLUTION OF MARINE SEDIMENTARY SEQUENCES														
6. Response of Marine Sedimentation to Fluctuations in Sea Level				●										
B.1. Deep-Sea Sedimentation and Sea Level														
Sea Level and the Pelagic Record				●										
Sea Level and Deep Margin Effects														
Relation of Sea Level to Abyssal Currents				◆	◆									
Sea Level and the Shallow Margin													▼	
Catastrophic Sea-Level Events							◆							
B.2. The Sedimentary Record of Abyssal Circulation				◆										
Contourite Drifts					◆									
Mud Waves					◆									
Unconformities				●	◆									
History of Abyssal Circulation				◆	◆			■						
B.3. Gravity-Displaced Sediments														
Submarine Fans										●				
Submarine Slides, Slumps & Debris Flows				●			●	●						


General and Specific Themes
Leg 101
Leg 102
Leg 103
Leg 104
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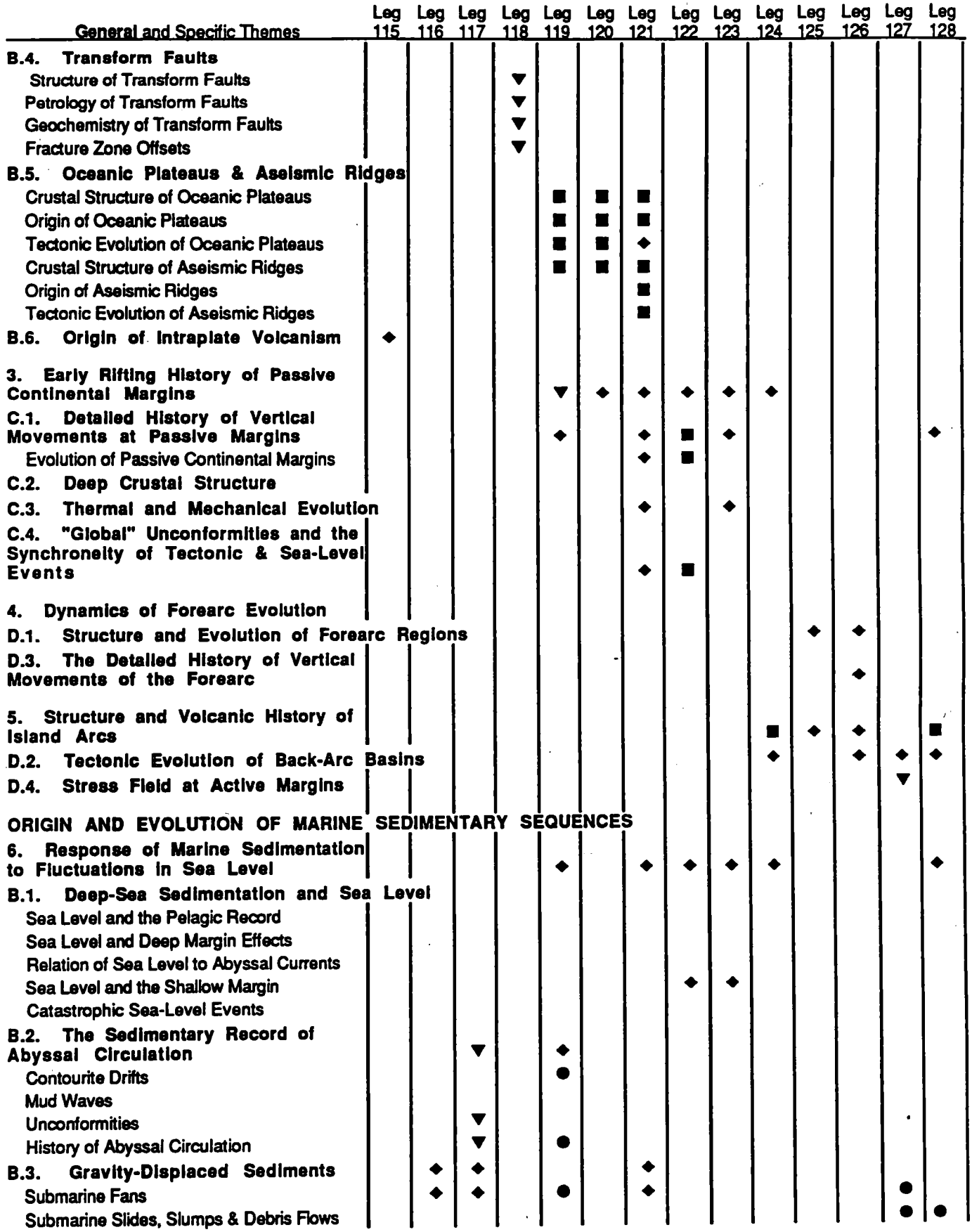
Leg 113
Leg 114
7. Sedimentation in Oxygen-Deficient Oceans
B.4. Sedimentation in Oxygen-Deficient Oceans
Geochemical Indicators of Organic Matter Preservation
Transects of Modern Oxygen-Minimum Zones and Their Neogene Record
The Red Sea as an Analogue to Eocene and Cretaceous Oceans
The Mediterranean as an Analogue to Eocene and Cretaceous Oceans
Cretaceous "Anoxic Events"
Phosphatic Sediments
B.5. Carbonate Platforms and Carbonate Reefs
Eustatic Sea Level
Paleogeography
Vertical Tectonics
Sclerochronology & History of Climate
Modern Carbonate Platforms as Facies Models
B.6. High Latitude Glacio-Marine Sedimentation
B.7. Rhythmic Sedimentation
B.8. Hiatuses & Unconformities, All Types
B.9. Carbonate Dissolution Profiles
B.10. Tectonic Setting and Sediment Facies
8. Global Mass Balancing of Sediments
C.1. Sedimentation in the Deep Sea
C.2. Paleogene Sediment Budget
C.3. Basin-Basin and Latitudinal Fractionation
C.4. Sediment Masses of the Continental Slope
Sediment Masses of the Continental Rise
C.5. Large Volume Marine Evaporites
C.6. Diagenesis and Global Cycling of Elements
C.7 Carbon Cycles
Sulfur Cycles
D. Post-Depositional Alteration
D.1. Alteration of Carbonate Minerals
D.2. Silica Diagenesis
D.3. Clays and Related Phases
D.4. Alteration of Organic Matter
D.5. Gas-Hydrates
D.6. Hydrothermal Sediments
D.7. Hydrology

General and Specific Themes	Leg 101	Leg 102	Leg 103	Leg 104	Leg 105	Leg 106	Leg 107	Leg 108	Leg 109	Leg 110	Leg 111	Leg 112	Leg 113	Leg 114
CAUSES OF LONG-TERM CHANGES IN THE ATMOSPHERE, OCEANS, CRYOSPHERE, BIOSPHERE, AND MAGNETIC FIELD														
9. Ocean Circulation History											◆			
B. Long-Term Changes in the Ocean and Atmosphere														
B.1. Mesozoic Ocean														
The Jurassic Superocean														
Hypsography of the Mesozoic Ocean														
Sea Level and Oceanic Climate in the Mesozoic														◆
B.2. Oceanic Circulation														
Formation of Deep Water								■					■	
Circulation of Deep Water				◆	◆		●	◆					■	◆
Gateways and Oceanic Circulation							●						■	◆
Surface Circulation				◆	◆			■				◆	■	◆
Response to Transient Events				◆			●	■						
B.3. Polar Oceans			◆	◆	◆									◆
10. Response of the Atmosphere and Oceans to Variations in Planetary Orbits				◆										
C.1. Climatic Response to Orbital Variations				◆				◆						
C.2. Orbital Tuning				▼										
D. Geochemical Cycling												◆		
D.1. Oceanic Biogeochemistry								■						
D.2. Oceanic Anoxic Events and Organic Carbon Sinks in the Mesozoic Ocean													◆	
D.3. Marine Record of Continental Environments								◆					■	
11. Patterns of Evolution of Microorganisms														
E. Biotic Evolution and Biogeography				◆										
E.1. Speciation and the Tempo of Evolution of Species								●					◆	
Speciation and the Mode of Evolution of Species													◆	
E.2. Macroevolution: Evolutionary Radiations													◆	
Macroevolution: Mass Extinctions											◆		◆	
Macroevolution: Biogeographic Realms				◆									◆	
External Causes of Evolution and Extinction in Biotas				◆								◆	◆	
F. History of the Earth's Magnetic Field														
F.1. Magnetostratigraphic Record		▼	●	◆				■						
F.2. Record of Polarity Transitions				◆			●	■	◆					
F.3. Excursions of the Magnetic Field				◆										
F.4. Plate Motions														
F.5. Reversal Timescales							●							

EVALUATION OF DRILLING RESULTS IN TERMS OF COSOD I OBJECTIVES

▼=proposed, not achieved; ■=proposed, partially achieved; ◆=proposed & achieved; ●=achieved but not proposed;

General and Specific Themes	Leg 115	Leg 116	Leg 117	Leg 118	Leg 119	Leg 120	Leg 121	Leg 122	Leg 123	Leg 124	Leg 125	Leg 126	Leg 127	Leg 128
ORIGIN AND EVOLUTION OF THE OCEANIC CRUST														
1. Processes of Magma Generation and Crustal Construction at MORs				■		▼								
Spacing of Submarine Eruptions														
Periodicity of Submarine Eruptions														
Volume of Submarine Eruptions														
2. Configuration, Chemistry and Dynamics of Hydrothermal Systems														
Formation of Ore Deposits on Crust														■
Formation of Ore Deposits Within Crust														
Physico-Chemical Distribution of Alteration in Crust in Time														
Physico-Chemical Distribution of Alteration in Crust in Space									●					
Relationship Between Hydrothermal Activity and Physical State of the Crust														
Relationship Between Hydrothermal Alteration and Volcanism														●
B.2.a. Compositional Heterogeneity of the Mantle									◆					
Mantle Evolution														
Origin of Structural Complexity of MORs									■					
B.2.b. Aging of the Crust									■	◆				
Evolution of the Crust														
B.2.c. Formation of Overly Thick Crust & Flood-Type Volcanism										■				
B.2.d. Structure of Transform Faults				▼										
Petrology of Transform Faults				▼										
Geochemistry of Transform Faults				▼										
Fracture Zone Offsets				▼										
B.2.e. Processes Operating in Young Ocean Basins														◆
Initiation of Rifting												◆		
B.2.f. Island Arcs and Backarc Basins										◆	◆	◆		◆
TECTONIC EVOLUTION OF CONTINENTAL MARGINS AND OCEANIC CRUST														
B.1. Dynamics of Magma Chambers and the Formation of the Oceanic Crust														
Problems of Magma Chambers				◆										
Problems of Magma Migration														
B.2. Hydrothermal Circulation at MORs														
B.3. Composition and Structure of the Lower Oceanic Crust and Upper Mantle														
Lower Two-Thirds of Layer 2														
Nature of the Layer 2/3 Boundary				▼										
Upper Portion of Layer 3				●										
Validity of the Ophiolite Analogy														


General and Specific Themes
Leg 115
Leg 116
Leg 117
Leg 118
Leg 119
Leg 120
Leg 121
Leg 122
Leg 123
Leg 124
Leg 125
Leg 126
Leg 127
Leg 128
B.4. Transform Faults
Structure of Transform Faults
Petrology of Transform Faults
Geochemistry of Transform Faults
Fracture Zone Offsets
B.5. Oceanic Plateaus & Aseismic Ridges
Crustal Structure of Oceanic Plateaus
Origin of Oceanic Plateaus
Tectonic Evolution of Oceanic Plateaus
Crustal Structure of Aseismic Ridges
Origin of Aseismic Ridges
Tectonic Evolution of Aseismic Ridges
B.6. Origin of Intraplate Volcanism
3. Early Rifting History of Passive Continental Margins
C.1. Detailed History of Vertical Movements at Passive Margins
Evolution of Passive Continental Margins
C.2. Deep Crustal Structure
C.3. Thermal and Mechanical Evolution
C.4. "Global" Unconformities and the Synchroneity of Tectonic & Sea-Level Events
4. Dynamics of Forearc Evolution
D.1. Structure and Evolution of Forearc Regions
D.3. The Detailed History of Vertical Movements of the Forearc
5. Structure and Volcanic History of Island Arcs
D.2. Tectonic Evolution of Back-Arc Basins
D.4. Stress Field at Active Margins
ORIGIN AND EVOLUTION OF MARINE SEDIMENTARY SEQUENCES
6. Response of Marine Sedimentation to Fluctuations in Sea Level
B.1. Deep-Sea Sedimentation and Sea Level
Sea Level and the Pelagic Record
Sea Level and Deep Margin Effects
Relation of Sea Level to Abyssal Currents
Sea Level and the Shallow Margin
Catastrophic Sea-Level Events
B.2. The Sedimentary Record of Abyssal Circulation
Contourite Drifts
Mud Waves
Unconformities
History of Abyssal Circulation
B.3. Gravity-Displaced Sediments
Submarine Fans
Submarine Slides, Slumps & Debris Flows


General and Specific Themes
Leg 115
Leg 116
Leg 117
Leg 118
Leg 119
Leg 120
Leg 121
Leg 122
Leg 123
Leg 124
Leg 125
Leg 126
Leg 127
Leg 128
7. Sedimentation in Oxygen-Deficient Oceans
B.4. Sedimentation in Oxygen-Deficient Oceans
Geochemical Indicators of Organic Matter Preservation
Transects of Modern Oxygen-Minimum Zones and Their Neogene Record
The Red Sea as an Analogue to Eocene and Cretaceous Oceans
The Mediterranean as an Analogue to Eocene and Cretaceous Oceans
Cretaceous "Anoxic Events"
Phosphatic Sediments
B.5. Carbonate Platforms and Carbonate Reefs
Eustatic Sea Level
Paleogeography
Vertical Tectonics
Sclerochronology & History of Climate
Modern Carbonate Platforms as Facies Models
B.6. High Latitude Glacio-Marine Sedimentation
B.7. Rhythmic Sedimentation
B.8. Hiatuses & Unconformities, All Types
B.9. Carbonate Dissolution Profiles
B.10. Tectonic Setting and Sediment Facies
8. Global Mass Balancing of Sediments
C.1. Sedimentation in the Deep Sea
C.2. Paleogene Sediment Budget
C.3 Basin-Basin and Latitudinal Fractionation
C.4. Sediment Masses of the Continental Slope
Sediment Masses of the Continental Rise
C.5. Large Volume Marine Evaporites
C.6. Diagenesis and Global Cycling of Elements
C.7. Carbon Cycles
Sulfur Cycles
D. Post-Depositional Alteration
D.1. Alteration of Carbonate Minerals
D.2. Silica Diagenesis
D.3. Clays and Related Phases
D.4. Alteration of Organic Matter
D.5. Gas-Hydrates
D.6. Hydrothermal Sediments
D.7. Hydrology

General and Specific Themes	Leg 115	Leg 116	Leg 117	Leg 118	Leg 119	Leg 120	Leg 121	Leg 122	Leg 123	Leg 124	Leg 125	Leg 126	Leg 127	Leg 128
CAUSES OF LONG-TERM CHANGES IN THE ATMOSPHERE, OCEANS, CRYOSPHERE, BIOSPHERE, AND MAGNETIC FIELD														
9. Ocean Circulation History					◆	◆	◆	◆	◆				◆	
B. Long-Term Changes in the Ocean and Atmosphere														
B.1. Mesozoic Ocean														
The Jurassic Superocean								▼	▼					
Hypsography of the Mesozoic Ocean														
Sea Level and Oceanic Climate in the Mesozoic					◆			◆	◆					
B.2. Oceanic Circulation														
Formation of Deep Water					■									
Circulation of Deep Water	◆													■
Gateways and Oceanic Circulation			◆		●	◆								
Surface Circulation														■
Response to Transient Events	◆					◆								■
B.3. Polar Oceans					◆									
10. Response of the Atmosphere and Oceans to Variations in Planetary Orbits			◆			◆	●							
C.1. Climatic Response to Orbital Variations														◆
C.2. Orbital Tuning														◆
D. Geochemical Cycling	◆		◆		◆	◆								
D.1. Oceanic Biogeochemistry	◆													
D.2. Oceanic Anoxic Events and Organic Carbon Sinks in the Mesozoic Ocean								■	■					
D.3. Marine Record of Continental Environments		◆	◆		◆	◆								
11. Patterns of Evolution of Microorganisms					◆		●	●						
E. Biotic Evolution and Biogeography														■
E.1. Speciation and the Tempo of Evolution of Species							●	●						
Speciation and the Mode of Evolution of Species														
E.2. Macroevolution: Evolutionary Radiations						■	■							
Macroevolution: Mass Extinctions					●	■	■							
Macroevolution: Biogeographic Realms						■	■		◆					
External Causes of Evolution and Extinction in Biotas					●		■							
F. History of the Earth's Magnetic Field														
F.1. Magnetostratigraphic Record			●		■	◆	●	■	◆	●			■	◆
F.2. Record of Polarity Transitions					●		●					●	■	●
F.3. Excursions of the Magnetic Field	◆													●
F.4. Plate Motions						◆	◆	◆	◆	◆		◆		
F.5. Reversal Timescales					■			■	■					

EVALUATION OF DRILLING RESULTS OF PAST LEGS IN TERMS OF OBJECTIVES AS STATED IN PROSPECTUS

▼-proposed, not achieved; ◆-proposed & achieved; ●-achieved, not proposed
■-partially achieved

Leg 100 (Shakedown)

▼1. Biostratigraphic reference sections for Gulf of Mexico.
▼2. Lithostratigraphic-seismostratigraphic correlations.
▼3. Unconformities as they correspond to seismic reflectors.
**Insufficient penetration.
◆4. Biostratigraphic-magnetostratigraphic-global geochronology & sea level.

Leg 101 (Bahamas)

◆1. Evolution of carbonate banks and slopes; "megabank" vs "graben" hypotheses.
◆2. Response of banks to sea level changes.
■3. Cretaceous anoxic events.
■4. Neogene climatic history of platforms.

Leg 102A (Old Oceanic Crust; W. Atlantic; reenter Hole 418A)
Leg 102B (Training)

◆ 1. Velocity structure of old crust; layer 2.
◆ 2. Permeability in old crust.
◆ 3. Porosity vs. depth.
◆ 4. Thickness of magnetic layer.
▼ 5. Presence of convection and underpressure?
▼ 6. Direction & magnitude *in situ* stresses.
◆ 7. Pore-water chemistry.
◆ 8. Temperature vs depth; heat transfer mechanism.
▼ 9. Eruptive history of layer 2.
◆10. Seismic anisotropy in layer 2.
▼11. Presence of sub-basement seismic reflectors?

Leg 103 (Galicia Margin)

◆1. History of rifting & subsidence of starved passive margin.
■2. Initiation of rifting.
◆3. Conjugate N. Am. passive margin history.
▼4. Deep crustal structure (S reflector)

Leg 104 (Norwegian-Greenland Sea)

◆1. Early stages of passive continental rifting.
-age & nature of dipping reflectors.
-age & nature of basement below dipping reflectors.
-subsidence & depositional history.

◆2. Paleoceanographic history - currents.
◆3. Paleoclimatic history - glaciation.
◆4. Cenozoic evolution in response to (2) and (3).

Leg 105 (Labrador Sea/Baffin Bay)

◆1. Tectonic development (subsidence history) of region.
◆2. Gateways & history of circulation.
◆3. Timing and nature of paleoclimatic changes.
◆4. Climatic response to orbital variations (glacial-interglacial cycles)
●5. Rhythmic sedimentation.

Leg 106 (MAR - Kane Fracture Zone)

◆1. Composition of magmas & relationship to erupted basalts.
▼2. Variation in space & time of magma generation & accretion.
▼3. Relationship of (2) to tectonic & hydrothermal activity.
▼4. Effects of transforms.
◆5. Duration & extent of hydrothermal activity; effects of alteration in crust.
◆6. Nature of earliest low-temp. alteration; effect on crustal mineralogy.
●7. Crustal magnetization vs depth; effects of hydrothermal and tectonic activity.

**Insufficient penetration; technical problems-bit failure.

Leg 107 (Tyrrhenian Sea)

◆1. Timing & rate of extension & subsidence.
-stretching phase.
-spreading phase.
◆2. Pre-rift sedimentary section.
◆3. Post-rift sedimentary section.
◆4. Syn-rift sedimentary section.
◆5. Plio-Pleistocene sedimentary section.
◆6. Stratigraphic correlations between Mediterranean & open ocean.
◆7. Back-arc basin evolution; test seaward migration of subduction zone hypothesis.

Leg 108 (E. Equatorial Atlantic)

◆1. History of upwelling intensity; seasonal vertical movement of thermocline:
-Atlantic-wide changes in paleo-productivity.
-variations in global CO_2 budget.
-deposition of organic carbon-rich sediments.
◆2. Late Neogene latitudinal stability of thermal equator:
-southern equatorial divergence zone.
-eastern boundary current & upwelling regions.
-response to major gateway changes.
▼3. Driving factors of tropical SST signals.

◆4. Wind-blown particle abundance; timing of changes in atmospheric circulation-climate fluctuations.
◆5. Neogene history of deep-water exchange between E. & W. Atlantic basins & through Kane Gap; incursions of Antarctic bottom water.
▼6. Changes in global ice volume vs deep water temperature during Tertiary.
◆7. High-resolution isotope stratigraphy of Pliocene and Pleistocene sediments.

Leg 109 (MAR - Kane Fracture Zone; deepen hole 648B)

◆1. Crustal accretion processes at oceanic spreading centers.
- -nature and relative abundance of parental and primitive melts; their relationship to evolved basalts in time and space
- -definition of magma "batches," small magma chambers, depth of chambers
- -depth and extent of low-T alteration, hydrothermal alteration & nature of transition between them; mineralization & effects
- -tilting and deformation at depth; effects on magnetic polarity
- -comparison of rock type, crustal structure & phys. props. with seismics

◆2. Layer 2.
- -In situ velocity structure of young Atlantic crust-porosity vs depth
- -permeability
- -temperature vs depth; heat transfer by convection or conduction?
- -underpressures and downhole flow of ocean bottom water
- -re-sample & analyze borehole fluids/pore fluids
- -refine eruptive history of Layer 2 extrusives from variations in magnetic susceptibility and NRM intensity, inclination and declination.

**technical problems=sticking, caving,lack of adequate drilling jars

●3. Upper mantle (peridotite in axial valley)

Leg 110 (Barbados Ridge, Lesser Antilles Forearc)

◆1. Mechanisms and conditions by which accretionary prisms develop, specifically, the geohydrological and structural; styles associated with an active accretionary margin.
◆2. Definition of fluid conduits of a "low permeability" accretionary prism.
▼3. Quantification of fluid pressures, permeabilities, and flow-rates in the fluid conduits of the accretionary prism.

Leg 111 (Hole 504B, EPR)

■1. Coring and logging the sheeted dike complex, Layer 2C.
◆2. High-resolution studies of Plio-Pleistocene biostratigraphy and paleoceanography of the E. Equatorial Pacific.
◆3. Geochemical studies of the advection of pore waters in the sediments and its effect on sediment diagenesis.

**technical problems-tool damage & failure, bit failure; poor recovery; bad hole conditions-inability to flush cutting from very deep hole, junk in hole, spalling, dense, crystalline nature of dikes.

Leg 112 (Peru Continental Margin)

◆1. Uplift and subsidence history of forearc.
- relate vertical movements to tectonic accretion & erosion

■2. Nature and age of transition zone between lower-slope accretionary complex and metamorphic block of continental affinity.

▼3. Age of metamorphic basement beneath outer Andean margin; P-T conditions of metamorphism through time.

◆4. Vertical movement of continental margin.

◆5. Reconstruct paleoceanographic conditions of upper-slope basin deposits in terms of response of the biological and sedimentary system to fluctuations in intensity & source of upwelling waters.

◆6. Quantify biogenic and clastic fluxes for evaluation of sea-level, climate & oceanic circulation interaction.

◆7. Conditions leading to formation of dolomites, phosphorites & cherts in upper-slope basin deposits.

◆8. Show that microbial activity persists to considerable depths & contributes greatly to diagenetic environment in carbon-rich sediments.

●9. Presence of subsurface brines & influence on early diagenesis.

Leg 113 (Weddell Sea, Antarctica)

■1. When did first Antarctic ice sheets form; have they been permanent?

■2. Timing of marine glacial conditions and formation of Antarctic Bottom Water.

■3. How have bottom & intermediate water temperatures responded to Antarctic glacial development?

◆4. History of oceanic planktonic productivity.
-How is it linked to Antarctic climatic evolution?
-How is it linked to oceanic environment?

◆5. Evolution of Antarctic planktonic and benthic biota & biogeographic patterns.
-How is this linked to environmental changes?

▼6. Early stages of passive continental rifting, and age and nature of seaward dipping reflectors

Leg 114 (Sub-Antarctic South Atlantic)

1. Development and influence of teleconnective passageways to oceanic circulation within the Southern Atlantic Ocean.

Paleoceanographic record:

◆a. Document late Cretaceous-Holocene paleoenvironmental evolution of passageway linking South Atlantic & Weddell basins.

◆b. Determine latitudinal and vertical temperature gradients in sub-Antarctic South Atlantic during Paleogene.

◆c. Document the establishment of the Antarctic Circumpolar Current.
◆d. Record more fully the middle to late Cenozoic Polar Front migrations.
◆e. Obtain records of changes in Antarctic climate and ice volume.

Mesozoic and Cenozoic regional geologic history:
■a. Ages and subsidence histories of Islas Orcadas & Meteor rises, and basin between them.
◆b. Age and nature of basement of Northeast Georgia Rise & its role in the evolution of Malvinas plate.
**Severe weather conditions

Leg 115 (Mascarene Plateau - Carbonate Dissolution Profile)

Tectonic:
◆a. Age of volcanism and its petrologic and geochemical character.
◆b. Definition of true polar wander within fixed hotspot framework.

Paleoceanographic & Stratigraphic:
◆a. Interplay between the flux in carbonate production and the dissolution of this material as a function of water depth during late Cenozoic.
◆b. How did intermediate and deep water masses respond to Miocene closing of Tethyan seaway, formation of permanent Antarctic ice cap during middle Miocene, and onset of northern hemisphere glacial/interglacial cycles during late Pliocene.
▼c. Fluctuation through time of boundary between the Equatorial Water and the Central Water.
●d. Diagenetic processes in periplatform oozes.
**Hole instability problems

Leg 116 (Distal Bengal Fan - Intraplate Deformation)

■1. Determine the age of the beginning of intraplate deformation and the subsequent history of the displacement of the fault blocks.
◆2. Characterize the lithofacies present on the distal Bengal Fan and determine the depositional processes responsible for them.
◆3. Nature of early diagenesis (to 1 km) in the submarine fan sediments.
◆4. Establish the provenance of the terrigenous sediments and use facies variations to document Himalayan uplift.
◆5. Relationship between fault zones, bedding planes, fractures and the flow of water as deduced from surface heat flow measurements.
◆6. Effects of regional compressive stress regime and high heat flow on the physical, hydrological and magnetic properties of the sediment and on the diagenetic process.
◆7. Depositional processes and rates through time and the growth of the Bengal Fan.
**Biostratigraphy for key site poor

Leg 117 (Oman Margin/Neogene)

◆1. History of Neogene monsoonal upwelling; variations in response to changing radiation budgets caused by changes in the earth's orbit around the sun and tectonic evolution of Central Asia.

◆2. Effects of changes in monsoonal intensity and glacio-eustatic sea-level fluctuations on sedimentary facies of organic carbon-rich, biogenic and eolian sediments on Arabian margin.
-extent of diagenesis; dolomite, phosphorite, etc.
-pore-water indicators of evaporitic hydrologic regimes, Oman Shelf.

◆3. Record of paleoceanographic circulation and origin of intermediate water flowing out of the Red Sea.

◆4. Mid-Indus fan record of Tibet-Himalaya uplift.
-depositional history of fluvial sediments in Pakistan.
-erosion of coastal deposits in climatic and sea-level cycles.

◆5. Tectonic origin and uplift history of Owen Ridge.
-tectonic history of Oman Basin.
-tectonic history of continental margin east of Masirah anticline.

Leg 118 (SW Indian Ridge - Fracture Zone Drilling)

▼1. *In situ* sampling and stratigraphy of oceanic mantle.

■2. Magma chamber processes.
-partial melting.
-melt extraction and modification in shallow magma chambers.

▼3. Determine lateral and vertical variability of rock types on floor of fracture zone.

▼4. Nature and distribution of deformation in a fracture zone and determination of whether there is a single slip plane, multiple slip planes or penetrative slip across the entire width of the feature.

◆5. Thermal structure of transform-generated crust; extent of alteration and sea-water penetration.

▼6. Nature and thickness of oceanic crust in the nodal basins where ridge crests meet the transform fault.

◆7. Physical properties, magnetism and seismic velocities of transform-generated crust; documentation of any anisotropy.

●8. Reference section for petrological variation of the lower oceanic crust.

●9. Deformation of a lower oceanic crustal section near a transform fault during cooling.

**Unstable hole conditions; sites unsuitable for guide-base deployment.

Leg 119 (Kerguelen Plateau and Prydz Bay)

◆1. Mesozoic through Holocene climatic and glacial history of E. Antarctica shelf sediments.

◆2. Role of changing climate in meridional and vertical evolution of water masses and their associated biota in the Southern Ocean.

◆3. Growth of E. Antarctic ice sheet through Oligocene and early Neogene.

◆4. History of glacial erosion of the shelf, an indication of ice sheet volume changes and with implications for bottom-water formation.
◆5. Documentation of other changes in shelf environment (depth, temperature, and sea-ice cover) before and during glaciation, providing secondary indications of climatic change.
▼6. Timing of E. Antarctic-India rifting and subsidence history of Kerguelen Plateau.
◆7. Nature and age of basement in S. Kerguelen Plateau region.
■8. Documentation of geologic development of N. Kerguelen Plateau.

Leg 120 (Central Kerguelen Plateau)

◆1. The nature and age of Kerguelen Plateau basement at sites located on identified structural elements.
◆2. Nature and ages of the different sedimentary sequences.
◆3. Tectonic history of Kerguelen Plateau.
-ages of unconformities.
-rifting.
-vertical movements.
■4. Paleoceanographic history of the region..
-latitudinal and vertical variations of water masses and biota through time.
-shift of the polar front.
-initiation and development of Circumpolar and Antarctic Bottom Water circulation.
●5. Patterns of evolution of microorganisms.

Leg 121 (Broken Ridge, Ninetyeast Ridge)

Broken Ridge (response of the lithosphere to rifting processes):

◆1. Age, lithology and depositional depth of the sediments in the dipping and truncated sedimentary sequence at Broken Ridge.
◆2. Age, lithology and depositional depth of the sediments making up the sub-horizontal sediments which cap the crest of B.R.
◆3. Using (1) and (2), determine what parts of the total sedimentary section are pre- syn- and post-rift deposits.
◆4. Use the drilling results as constraints on the timing and duration of the rifting event; determine vertical motion of B.R. as it responded to the rifting process.

**RCB bit failure

●5. K/T boundary section at Site 752.

Ninetyeast Ridge (origin & tectonic history; plate motion; paleoceanography):

◆1. Obtain petrological and geochemical data from basement rocks to understand the origin of Ninetyeast Ridge and its relationship to Kerguelen Plateau.
■2. High-resolution study of northward motion of India from paleomagnetic inclinations of recovered samples. (POST CRUISE STUDY)

◆3. S-N transect in E. Indian Ocean as a data base for paleoclimatological changes.
●4. Monsoon changes with orbital variations at Site 758.

Legs 122 and 123 (Exmouth Plateau and Argo Basin)

■1. Understand Late Triassic-Jurassic pre- and syn-rift history and rift-drift transition in a starved passive continental margin setting.
◆2. Determine the geochemical and and physical characteristics of the oldest Indian Ocean crust and the bulk geochemical composition as a reference section for understanding global geochemical fluxes at subduction zones.
◆3. Study Late Jurassic-Early Cretaceous to Cenozoic post-breakup development of sedimentation and paleoenvironment from a juvenile to a mature ocean.
■4. Study the temporal and spatial distribution of Jurassic, Cretaceous and Tertiary sequence stratigraphies in order to evaluate the effects of basin subsidence, sediment input, and sea-level changes in an almost complete, undisturbed, classic passive margin section.
■5. Refine the Mesozoic geological time scale.
■6. Investigate Middle Jurassic and Middle Cretaceous anoxic sedimentation in terrigenous, shallow-water marine and deep-water marine environments.
■7. Document Cretaceous/Tertiary boundary stratigraphy.
◆8. Log proposed site AAP1B.

Leg 124 (Southeast Asia Basins: Sulu, Celebes and Banda Sea)

◆1. Determine ages of the SE Sulu and Celebes Sea basins in order to establish the time of drifting and to test various proposed models for their origin.
◆2. Establish stratigraphic history of the basins, particularly with respect to whether its paleoenvironment reflects a basin with an open, closed, or restricted circulation, and to the timing of major volcanic, collisional, and paleoceanographic events.
◆3. Determine in situ regional stress orientations within the basins and discern whether subduction- or collision-related forces predominate.
●4. Excellent magnetostratigraphic records.
●5. Sedimentary geochemistry/crustal alteration.

Leg 124E (Philippine Sea)

Engineering Objectives:

◆1. Shallow-water concept evaluation of diamond coring system (DCS).
■2. Continued operational evaluation of developmental navidrill core barrel system (NCB).
◆3. Prototype testing of pressure core sampler (PCS), phase I.
■4. Performance testing of the newly redesigned extended core barrel (XCB).

◆5. Performance evaluation of ODP coring systems in deep-water chert sequences.
▼6. Testing and evaluation of Lamont/BRG logging technology.
▼7. Evaluation of deep-water operating capabilities of *JOIDES Resolution.*
*Scientific objectives were secondary.
**Basement too deep; bad weather; hole instability

Legs 125 and 126 (Bonin-Mariana Arc-Trench System)
Bonin back-arc:
◆1. The differential uplift/subsidence history of the rift basin and adjacent arc.
◆2. The nature of volcanism and sedimentation in the rift and on the arc.
◆3. The duration of rifting and the nature of the rift basement.
◆4. The chemistry of hydrothermal fluids circulating in the rift basin.
Bonin forearc:
◆1. The uplift/ subsidence history across the forearc to provide information on forearc flexure and basin development, as well as the extent of tectonic erosion.
◆2. The stratigraphy of the forearcs with its record of (a) sedimentation, depositional environment and paleoceanography; and (b) the variations in intensity and chemistry of arc volcanism through time.
◆3. The nature of igneous basement forming the frontal arc, outer-arc high and beneath the intervening basin to answer questions concerning the initial stages of subduction-related volcanism, the origin of boninites, and the formation of the 200 km wide arc-type forearc crust.
◆4. The micro-structural deformation and the large-scale rotation and translation of the forearc.
●5. Excellent record of Brunhes/Matuyama polarity transition.
●6. Sediment alteration and pore-water geochemistry: generation of calcium chloride brines.
Mariana forearc:
◆1. The timing and mechanism of emplacement of the serpentinite seamounts, including their internal fabric, fracture patterns and flow structures.
◆2. The chemistry and, hence, source of the associated fluids.
◆3. The conditions at depth in the outer forearc from the igneous and metamorphic petrology of the lower crustal/upper mantle rocks.

Leg 127 (Japan Sea 1)
◆1. Age and nature of acoustic basement.
◆2. Oceanographic and sedimentation history including history of anoxia and circulation; CCD fluctuations and carbonate preservation; diagenesis.
◆3. The timing of compression of the eastern margin and uplift of the Okushiri Ridge.
▼4. Assessment of magnitude and direction of the present horizontal stress field through packer experiments and BHTV logs.
**Unstable hole conditions; stuck pipe.

Leg 128 (Japan Sea 2)

■1. Depositional and paleoenvironmental history of back-arc failed-rift sequence as a potential site of hydrothermal/volcanogenic metalliferous ores (Kita-Yamato Trough).

◆2. Recovery of late Neogene paleoceanographic reference section for Sea of Japan.

■3. Subsidence/uplift history of back-arc basin margins.

■4. Gateway-sealevel control of marginal sea circulation and paleoceanography.

■5. Age and nature of back-arc basement sequence and subsidence history.

◆6. Patterns of diagenesis in siliceous (diatomaceous) sediments and correlation with seismic reflection records.

◆7. Relationships between lithofacies patterns and tectonic and paleoceanographic history of back-arc basin.

■8. Biostratigraphy of Neogene temperate and high-latitude siliceous and calcareous plankton.

◆9. Emplacement of borehole seismometer and multi-ship seismic experiment.

◆10. Large-scale electrical resistivity experiment.

◆11. Sterile microbiological sampling.

●12. High-resolution record of Quaternary climatic, paleoceanographic, and explosive volcanic events in the Sea of Japan.