JOIDES PLANNING COMMITTEE MEETING
30 November - 4 December 1987
Sunriver, Oregon

AGENDA

ADDITIONAL ATTACHMENTS:

JOIDES MEETING SCHEDULE

Date	Place	Committee/Panel
2-5 November	London	WPAC
30 Nov - 4 Dec	Bend, OR	PCOM/Panel Chairmen (Annual Meeting)
6 December	San Francisco	PPSP
16-17 January*	London	PPSP
19-20 January	Miami	DMP
26-28 January*	College Station	IHP
19-12 February*	Menlo Park	CEPAC
March*	London	SSP
1-3 March*	Hawaii	LITHP
7-9 March*	Houston	SOHP
25-27 May	Palisades	EXCOM/ODP Council
20-22 April	College Station	PCOM
June*	Hannover	TECP
14-16 September	Edinburgh	EXCOM

* Tentative meeting (not yet formally requested/approved)
(rev. 10/30/87)

October 1987

JOIDES RESOLUTION OPERATIONS SCHEDULE
LEGS 118-129

LEG	AREA	DEPARTS		ARRIVES		
		LOCATION	DATE	DESTINATION	DATE	IN PORT
118	Southwest Indian Ridge Fracture Zone	Mauritius	23 October	Mauritius	14 December	14-18 December
119	Kerguelen Plateau and Prydz Bay	Mauritius	19 December	Mauritius	20 Feb 1988	20-24 February
120	Central Kerguelen Plateau	Mauritius	25 February	Freemantle	26 April	26-30 April
121	Broken Ridge and N90°E Ridge	Freemantle	1 May	Singapore	23 June	23-27 June
122	Exmouth Plateau	Singapore	28 June	Singapore	27 August	27-31 August
123	Argo Abyssal Plain and Exmouth Plateau	Singapore	1 September	Darwin	29 October	29 Oct - 2 Nov
124	Sulu Sea/So.China Sea	Darwin	3 November	Manila	14 December	14-18 December
125	Bonins I	Manila	19 December	Tokyo	8 Feb 1989	8-12 February
126	Bonins II	Tokyo	13 February	Yokohama	10 April	10-14 April
127	Nankai Trough	Yokohama	15 April	Yokohama	12 June	12-16 June
128	Japan Sea I	Yokohama	17 June	Niigata	2 August	2-6 August
129	Japan Sea II	Niigata	7 August	Nagasaki (?)	7 September	
	Dry Dock	Nagasaki (?)				7-20 September

NOTE: Ports and dates after Leg 121 are tentative and should be used as estimates only. (Rev 9/18/87)

ITEM D. EXCOM REPORT

The last EXCOM meeting was held 5-7 October 1987 in Nikko, Japan. Results from that meeting which are of interest for this PCOM meeting are listed below. Copies of the EXCOM meeting minutes are available from the JOIDES Office.

- EXCOM endorsed and recommended implementation of the editorial and publications policy developed by the IHP.

- EXCOM approved the FY88 program plan as revised August 6, 1987 by JOI, Inc.

- EXCOM endorsed the new outline for proposal processing developed at the last PCOM meeting, with the addition that regional panels should provide input on alternative areas which can better address problems posed by proposals.

- EXCOM endorsed the establishment of PCOM's subcommittee to review the advisory panel structure.

- EXCOM made changes in its BCOM representation by appointing J.Briden (U.K.) and B.Lewis as the new non-U.S. and U.S. representatives, respectively, with C.Helsley to serve as BCOM Chairman for the next year. Changes in PCOM representation were left for PCOM action.

- With no foreseeable budget concerns, EXCOM advises PCOM to proceed with the development of the FY89 science plan.

- EXCOM considered a strawman timetable for the review, evaluation, and incorporation of COSOD II recommendations into the JOIDES/ODP planning process (see following page).

- EXCOM appointed a subcommittee to review agenda content for the next few meetings to insure that EXCOM decisions are kept at a policy level, and do not involve science planning issues. Subcommittee members are M.Keen (Canada), C.Helsley (HIG), J.Baker (JOI, Inc.), and N.Pisias (PCOM). The subcommittee will communicate via telephone and telemail prior to the next EXCOM meeting.

- EXCOM directed the non-U.S. PCOM members to meet during the annual PCOM meeting to consider French and Canadian nominations for the position of Non-U.S. Liaison and Executive Assistant to the JOIDES Office. It was recommended that the PCOM Chairman and HIG representatives also participate in the selection of this person who will serve with the JOIDES Office during its tenure at HIG.

- EXCOM endorsed an oral request for French re-entry of Hole 396D, contingent upon PCOM approval of the request at its next meeting.

- EXCOM appointed a subcommittee to develop long-term options for increasing involvement of developing countries in ODP. The subcommittee members are J.Baker (JOI, Inc.), H.Duerbaum (FRG), and J.Stel (ESF).

- EXCOM passed a motion acknowledging J.Clotworthy's (JOI, Inc.) long association with ocean drilling, thanking him for his contributions to both the DSDP and ODP, and wishing him well in his retirement.

Item D. EXCOM Report, continued

STRAWMAN TIMETABLE FOR EVALUATION AND INCORPORATION OF COSOD II RECOMMENDATIONS

1 Mar 88 — COSOD II report assumed to be available

21 Apr 88 — PCOM Meeting:

- PCOM Subcommittee will report on advisory structure in relationship to COSOD II recommendations
- PCOM will discuss COSOD II objectives in relationship to present objectives of ODP and in terms of 4-year view of upcoming drilling, as mandated by PCOM Terms of Reference.

25 May 88 — EXCOM Meeting:

- PCOM reports on possible advisory structure and makes its first set of suggestions for these changes
- PCOM reports on initial view of the relationship of COSOD II objectives to present objectives of ODP
- EXCOM formulates initial instructions to PCOM on how to begin implementing COSOD II recommendations

Aug 88 — PCOM Meeting:

- PCOM discusses EXCOM instructions and formulates recommendations on how to address COSOD II objectives

Fall 88 — EXCOM Meeting:

- EXCOM provides specific instructions to PCOM for their December 1988 Annual Meeting

ITEM F. JOI, INC. REPORT

After the Sunriver meeting PCOM needs to forward a firm FY89 science plan to JOI, Inc. To familiarize you, a timetable for development of the FY89 budget and program plan is shown below. PCOM input is (as defined by EXCOM and JOI, Inc.) through PCOM meetings and the BCOM (Budget Committee).

ODP PROGRAM PLAN DEVELOPMENT

Timetable for FY 89 Program Plan

6-8 Oct 87	EXCOM advice to PCOM
30 Nov-4 Dec 87	PCOM science plan and advice to JOI/EXCOM
5 Jan 88	NSF target budget to JOI/JOIDES
2 Feb 88	JOI outline (contractor budgets) to NSF/JOIDES BCOM
	If no problems, mail to EXCOM If problems, BCOM proposes solution
1 Apr 88	JOI plan to NSF for administrative review (includes JOIDES suggestions, if required)
7 Apr 88	JOI revisions
15 Apr 88	~~JOI~~ draft program plan and NSF concerns to JOIDES BCOM, EXCOM and ODP Council
21-23 Apr 88	PCOM review
10 May 88	JOI review with JOIDES BCOM
25-27 May 88	EXCOM/ODP Council meeting:
	JOI/BCOM give input to EXCOM, EXCOM gives advice to NSF/JOI, with ODP Council consultation
15 July 88	NSF final review of revised JOI plan
22 July 88	JOI final modifications (if necessary)
1 Aug 88	NSF executes contract, JOI informs EXCOM and ODP Council (changes justified), and PCOM
Fall 88	EXCOM give final approval to Program Plan
1 Oct 88	Start of contract year

ITEM K. COSOD II

An extensive discussion on COSOD II will depend, in part, on the availability of the COSOD II Report. At the October EXCOM meeting, Bernard Munsch, ESF Consortium, offered to express mail copies of the report to PCOM members as soon as the report is available.

The following attendees to the October 19-21 meeting of the COSOD II Steering Committee will be present at this meeting and might provide an update on the status:

Miriam Kastner: Steering Committee
Sy Schlanger: Steering Committee (through Dec.1)
Tom Pyle: JOI Inc.

COSOD II will have implications in the discussion of Long-Range Planning for ODP. However, a detailed discussion of recommendations has to wait until the final COSOD II report is in hand.

For a start, PCOM might consider COSOD II in a historical perspective to COSOD I, (as economists are now advising distraught investors to consider their recent losses in perspective to the Great Depression). Below is a listing of the top priorities from the COSOD I document.

COSOD I top priorities:

1. Processes of magma generation and crustal construction at mid-ocean ridges.
2. Configuration, chemistry, and dynamics of hydrothermal systems.
3. Early rifting history of passive continental margins.
4. Dynamics of forearc evolution.
5. Structure and volcanic history of island arcs.
6. Response of marine sedimentation of fluctuations in sea level.
7. Sedimentation in oxygen-deficient oceans.
8. Global mass balancing of sediments.
9. History of ocean circulation.
10. Responses of the atmosphere and oceans to variations of the planetary orbits.
11. Patterns of evolution of microorganisms.
12. History of the earth's magnetic field.

[See p. 101 for a historical (and controversial) discussion on the usefulness of COSOD I.]

ITEM L. INDIAN OCEAN PLANNING

LEG 118 (SWIR):

Co-chiefs: P.Robinson (C), R.von Herzen
Priorities:
1. Deploy hard-rock guide base and drill at median ridge site within the Atlantis Fracture Zone.

There has been a long ongoing discussion about the priorities of this leg. The latest discussion circled around the need for an engineering test of the HRGB. Lou Garrison explained the concerns of the engineers who need the experience of testing a modified device. To reduce the possible impact of an unsuccessful HRGB deployment on the rest of the leg, PCOM previously added 10 days operational time to the leg. At the August PCOM meeting in Nikko, the following motion was passed to resolve all uncertainties about the deployment of the guidebase (see full discussion in PCOM minutes, p. 43):

PCOM Motion:
If weather conditions permit, a full engineering test of 15 days duration, for the hardrock guidebase and drilling system will be conducted on Leg 118.

At the median ridge no suitable site for deployment of the guidebase could be found; the ridge is either covered by sediment or rubble. Therefore, the ship moved on to the alternate site, SWIR II (west transform wall), where things presently look more promising. Lou Garrison may provide an update on teh developments of Leg 118.

LEG 119 (N-KERGUELEN/PRYDZ BAY):

Co-chiefs: J.Barron, B.Larson (ESF)
Sites: KHP-1 (with re-entry cone), SKP-6a, PB1-PB4, (SKP-6b alternate for Prydz Bay drilling)
Ice-support vessel: TAMU may provide an update on plans to use the MAERSK MASTER as the ice patrol boat.

PPSP (see p. 104): Site SKP-6b was moved slightly, along the same line, to fit safety requirements. The Prydz Bay sites were approved earlier.

IOP: Endorses SKP-6b as first priority alternate for Prydz Bay sites.

Item L. Indian Ocean Planning, continued

LEG 120 (S-KERGUELEN):

Co-chiefs: R.Schlich (F), W.Wise
Sites: SKP-1,SKP-2, SKP-3, SKP-4A; deepening of KHP-1

PPSP (p. 104): Site SKP-3 only was approved to a depth of 800 m (planned for 1300m).

IOP: To solve problems with SKP-3, the site will be moved on existing line to a safe location with thinner upper sequence; the main objective is an expanded Paleogene & Cretaceous pre- and syn- rift section. PPSP approved this procedure in principle; no additional safety meeting is necessary.

If time permits, KHP-1 should be revisited to core the lower sequence (deepen KHP-1); in case no re-entry cone was set during Leg 119, IOP recommends washing through the top 500m, then start coring.

PCOM IS ASKED TO:

I. RECOGNIZE THE IOP RECOMMENDATION TO RELOCATE SITE SKP-3 TO SATISFY SAFETY CONCERNS AND ADDRESS PRIME OBJECTIVES.

II. RECOGNIZE THE RECOMMENDATIONS FOR DEEPENING KHP-1, TIME PERMITTED.

LEG 121 (BROKEN RIDGE/90^{o}E RIDGE):

Co-chiefs: J.Peirce (C), J.Weissel
Sites: BR1-BR4, 90ER-2, 90ER-5 and a set of two sites on N-90^{o}ER (NNER-9, NNER-10)

IOP:

- Recommends moving site BR-1 about 5 km downslope to get a more complete section; a clastic wedge underlying the tilted pelagic sequence can be additionally addressed with this relocation.

- Strongly recommends to double HPC/APC the Neogene sections (top 150-200 m) at the Central and Northern 90^{o}E Ridge sites (high resolution is expected and perfectly fits into cross-leg studies with samples from Legs 115 and 117). This adds approximately 3 days to time estimates.

- IOP priorities are Northern and Central 90^{o}E Ridge sites, the Southern site has a lower priority (in case drilling time estimates are too optimistic).

- At the Central Ridge site it is recommended to drill about 100 m basement; as basement drilling time seems to be overestimated (as was on Leg 115) -- this doesn't expand drilling time requirements.

Item L. Indian Ocean Planning, continued

LEG 122 (EXMOUTH PLATEAU):

Co-chiefs: U.von Rad (FRG), B. Haq
Sites: EP-2A, EP-6, EP-7, EP-10A

A proposal (288/B) for relocating site EP-2A to EP-12 had been sent to IOP and SOHP for consideration.

SOHP: Endorses the proposed relocation but feels evaluation of the rationale behind this proposal should be done by TECP and LITHP (see SOHP minutes, p. 108). Site Priorities: EP-7, EP-10A, EP-2A (or EP-12), EP-6

IOP:

- Feels proposed relocation to site EP-12 may have severe safety problems as it is close to an industry well showing gas.

- The proposal (288/B) needs a revision to provide some concept of how drilling can solve the dispute as to which model of crustal stretching affected site EP-12 (block faulting vs. listric faults).

- This problem assumed solved IOP priorities for sites are

  Priority 1: EP-7, EP-10A, EP-12, EP-2A
  [Note: Site EP-6 is eliminated]

  Priority 2: EP-7, EP-10A, EP-2A, EP-6 If no convincing concept for EP-12 can be provided. [Note: These are the present sites]

TECP: Didn't provide input though the proposal was also sent to TECP. D.Cowan might provide some comments at the meeting.

PPSP: A safety review is presently scheduled for 6 December in San Francisco.

PCOM IS ASKED TO:

I. RECOGNIZE SOHP'S RECOMMENDATIONS REGARDING RELOCATION OF SITE EP-2A.

II. RECOGNIZE IOP'S RECOMMENDATIONS TO ADD EP-12 AND DROP EP-6, PENDING A REVISION OF PROPOSAL 288/B.

LEG 123 (ARGO ABYSSAL PLAIN):

Co-chiefs: F.Gradstein (C), to be named
Sites: EP-9B, AAP-1B

IOP: Site EP-9B has been moved slightly for safety reasons, and should now read EP-9E.

SOHP: If basement drilling at AAP-1B will be unsuccessful, the panel recommends directing the time towards Site AAP-2.

ITEM M. WESTERN PACIFIC PLANNING

At the August meeting in Nikko, PCOM had a detailed discussion on the top-ranking WPAC programs. As a result, the first six legs of WPAC drilling were agreed upon. The tentative FY89 science plan must be updated and finalized during this meeting. WPAC planning status after the August PCOM meeting is as follows:

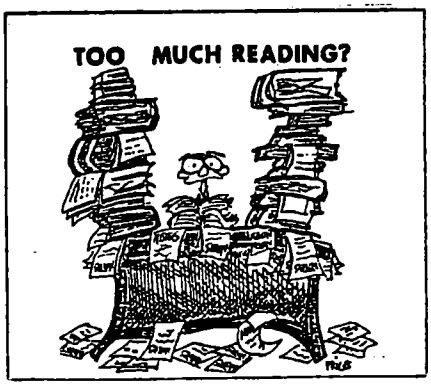
FY89 (First Year):

Leg 1: Banda-Sulu-SCS Basin	(BNDA 1, SUL 5, SCS 5, SCS9)
Leg 2: Bonin I	(BON 1, BON 2, BON 5A, BON 5B)
Leg 3: Bonin II	(BON 6, + diapir/or forearc terrace)
Leg 4: Nankai	(NKT 1, NKT 2)
Leg 5: Japan Sea I	(J-1B, J-1D, J-1D, J-3A)
Leg 6: Japan Sea II	(J-2A, JS-2)

FY90 (Second Year):

Nankai Geotech/Zenisu Ridge
Bonin Reference Hole[s]
CEPAC program ? (Sunda ? - SCS margin ?)
Northeast Australian Margin (1 leg program)
Vanuatu (1 leg program: DEZ 1-5 (5 sites) IAB-1a, IAB-2)
Lau Basin (1 leg program focused on backarc objectives)

In addition PCOM formulated leg or program specific questions which were addressed to WPAC and the thematic panels. The panels' responses will be summarized below on a program by program basis.



Make the proper choice.

Item M. WPAC Planning, continued

FY89 Science Plan

1. Banda-Sulu-SCS Basin (Leg 124):

- Present status: one Banda Sea (BNDA 1), one Sulu Sea (SUL 5) & two SCS basin sites (SCS 5, SCS 9). WPAC is asked to discuss this outline and provide its view. Re-expansion of this one-leg outline would need an excellent scientific justification.

- Site Survey: There is no new site survey data in the Banda Sea. The RV FRED MOORE cruise of Eli Silver was not conducted in the way planned due to clearance problems with Indonesia and technical problems with the vessel.

- TECP (see p. 147): Reiterates its support for a Celebes Sea drill site. A proposal covering this issue was recently forwarded to TECP but didn't make the late September 1987 meeting.

- SOHP (see p. 109): Prefers to have two sites in Sulu Sea (one basin, one margin) to evaluate sill control. If only one site is scheduled SULU-4 is the priority. The Banda Sea priority is BNDA-1, for S.China Sea its SCS-5.

- WPAC: As WPAC met recently an update will be available at Sunriver. N.Pisias acted as PCOM liaison to the WPAC meeting.

- Clearance: The western S.China Sea site SCS-5 is situated in disputed waters claimed by both the Chinese and Vietnamese. This makes a request for clearance a difficult task.

PCOM IS ASKED TO:

I. DISCUSS THE WPAC RECOMMENDATIONS RE LEG 124 AND DECIDE WHETHER ANY CHANGES TO THE PRESENT OUTLINE ARE FAVORABLE.
SHOULD A SITE BE ADDED (CELEBES SEA SITE) - OR EXCHANGED ?

II. RECOGNIZE THE NEED FOR EARLY ACTION TO AVOID CLEARANCE PROBLEMS FOR SITES IN INDONESIAN WATERS (BNDA 1).

III. RECOGNIZE THAT SITE SCS-5 IN THE S.CHINA SEA IS CLAIMED BY BOTH CHINA AND VIETNAM MAKING A REQUEST FOR CLEARANCE DELICATE.

IV. DEFINE BACK-UP SITES OR AN ALTERNATIVE PLAN FOR THOSE SITES OF LEG 124, WHICH POTENTIALLY CANNOT BE DRILLED BECAUSE OF CLEARANCE PROBLEMS OR OTHER REASONS.

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2. Bonin I (Leg ~~125~~ 127):

- Status: Sites BON 1, BON 2, BON 5A, BON 5B

- No problems are anticipated with this leg. WPAC's comments will be available in Sunriver.

Item M. WPAC Planning, continued

3. Bonin II (Leg 126):

- Status: Sites BON-6 and either diapir or forearc terrace basement site(s). LITHP and TECP were charged with providing justification for which one should be of higher priority.

- LITHP (see p. 171): Recommends drilling a pair of sites: one going for terrace basement the second for an associated diapir, both in the same arc. Top priorities are Conical Seamount (MAR-3) and an adjacent forearc site in the Marianas. Site BON-7 is lower priority.

  [Note: Both sites are also recommended as part of the geochemical reference hole concept].

- TECP (see p. 141): Enthusiastically recommends drilling two holes in Conical Seamount in the Marianas, one in the center and a second on the flank of the diapir. This concept addresses fabric, fluid regime and history of an active serpentine diapir. Also seen as an important component for geochemical reference hole concept. Site BON-7 is of lower priority.

PCOM IS ASKED TO:

I. DECIDE WHAT SCIENTIFIC PRIORITIES ARE TO FIT INTO THE SECOND HALF OF LEG 126 (BONIN II) - ULTRAMAFIC DIAPIRS IN THE MARIANAS ?

II. BE OVERWHELMED BY THE 'AGREEMENT' OF THE TWO THEMATIC PANELS.

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4. Nankai Trough (Leg ~~127~~ 128):

- Status: Sites NKT 1, NKT 2. PCOM requested comments from SOHP and TECP on possible hydrogeology/fluid sites (e.g. NKT 3, NKT 7).

- SOHP (p. 110): Is willing to review Nankai proposal hydrology/ fluid circulation aspects but it cannot to do so as it has no proposal to evaluate. The panel feels the Oregon margin proposal (233/E) specifically addressing this topic would be more appropriate to consider.

- TECP (p.142): Strongly supports the general theme of fluid flow etc. in accretionary prisms and forearcs. However, as yet there is no proposal which specifically addresses these problems at Nankai. There is, however one for the Oregon margin (233/E). TECP will review such a proposal as soon as submitted and compare it to 233/E.

PCOM IS ASKED TO:

I. RECOGNIZE THAT THE PANELS RESPONSE REFLECTS THE LACK OF A PROPOSAL SPECIFICALLY ADDRESSING THIS TOPIC AT THE NANKAI PRISM.

Item M. WPAC Planning, continued

5. Japan Sea I (Leg ~~128~~ 129):

   - Status: Sites J-1B, J-1D, J-1E, J-3A
   - No new information.

6. Japan Sea II (Leg ~~129~~ 130):

   - Status: Sites J-2A, JS-2
   - No new information.

This tentative leg plan for FY89 is relatively well adapted to the existing weather constraints (main typhoon season for Nankai/Bonin is August through October. A possible reorganization must consider these constraints.
DMP recommendations for logging are shown on p. 221.

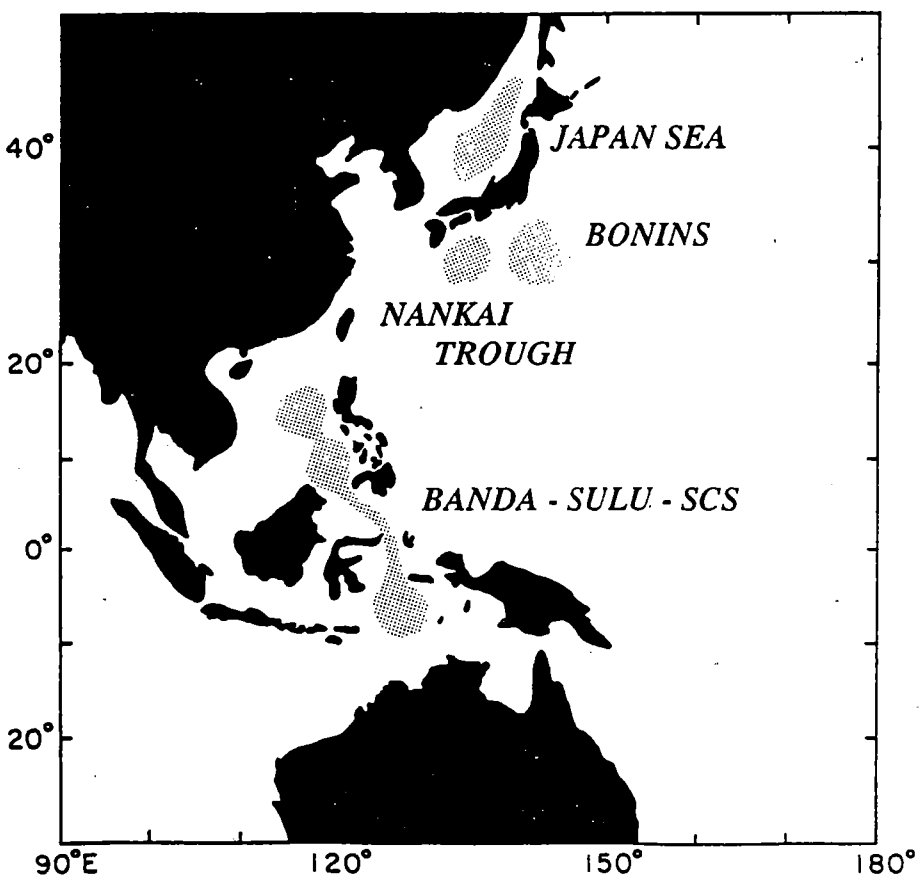
PCOM IS ASKED TO:

I. KEEP WEATHER CONSTRAINTS IN MIND IF CONSIDERING 'RESHUFFLING' OF FY89 LEGS.

II. DISCUSS AND DEFINE ENGINEERING NEEDS FOR THE SIX FY89 LEGS.

III. FINALIZE THE FY89 SCIENCE PLAN, WHICH IS NEEDED FOR DEVELOPMENT OF THE APPROPRIATE FY89 BUDGET.

IV. CONSIDER WHETHER THERE ARE OTHER OPTIONS FOR DRILLING IN FY89 ?



Item M. WPAC Planning, continued

FY90 Science Planning

7. Nankai Geotech/Zenisu Ridge:

No new comments. At its August 87 meeting, DMP favored the Nankai Geotech as part of a Nankai leg over a special mini-leg. A problem might be the timely availability of the necessary specialty tools.

8. Geochemical Reference hole(s) in Bonin area:

- Status: At the last PCOM meeting the idea of geochemical reference hole(s) was considered to be very interesting but LITHP was requested to provide a well defined minimum approach, and justifications for such a concept, for evaluation at this meeting.

- LITHP: As a minimum drilling strategy for geochemical reference hole(s) 4 holes are recommended requiring a leg and a half: 1 deep hole outboard of the Bonins (BON-8, ca.200m basement), and 3 shallower holes near the Mariana transect of legs 59 & 60 (MAR-4: complete transect, MAR-5:seamount apron, MAR-6: seamount summit). If only one leg were available BON-8 & one shallow Mariana hole would be recommended (see p. 171). A three-page rationale (see p. 167) provides background for LITHP's recommendation.

9. Sunda backthrusting:

- Status: This program was excluded from FY89 considerations because of too many open questions. However, if thematically (TECP) well supported, PCOM was willing to consider it for FY90 drilling.

- TECP (see p. 143): Discussed this program again but didn't change its ranking (#9). The panel is still not convinced that the program is able to properly address the first priority objectives. There is also uneasiness about what would be the appropriate drilling strategy.

- Site survey: No new site survey data is available. A site survey cruise by RV FRED MOORE (Eli Silver) was to provide essential MCS data for Sunda sites and some Banda Sea sites. The cruise was not conducted because of clearance problems with Indonesia and technical problems with the vessel.

- WPAC: Nick Pisias will report on WPAC comments from the early November meeting in London.

10. Northeast Australian Margin:

- Status: PCOM asked SOHP to provide detailed justification for the scientific objectives and how they will be addressed. Questions were raised as to how subsidence and sea level effects can be distinguished and to what extent the margin sites and Queensland Plateau sites provide overlapping sequences. LITHP should forward comments on proposal 268 ("Mississippi valley type ore deposition).

Item M. WPAC Planning, continued

- SOHP: A written scientific justification for NEA drilling to answer PCOM's questions will be provided at the Sunriver meeting. With regard to the MVT proposal (see p. 129), justification for separate sites is considered poor but efforts should be made to address relevant questions at the planned holes.

- LITHP (see p. 172): Though addressing important scientific problems, LITHP doesn't view the MVT proposal (268/D) as being of central importance to LITHP thematic objectives, either globally or in WPAC. LITHP suggests that efforts be made to integrate this work with SOHP objectives in the area without extending drilling time (1 leg).

- WPAC: Comments from the most recent meeting will be available at Sunriver.

- Site Survey: An Australian cruise (MCS, 3.5KHz, sidescan, magnetics, gravity, coring) was conducted in this area in Sep/Oct 1987. According to participants it acquired excellent seismics and other site specific information and up to 9 crossing lines per site. An update/addendum to the proposal is in preparation.

11. Vanuatu:

- Status: PCOM asked WPAC to provide a one-leg-outline for this program focussing on the D'Entrecasteau Ridge And Aoba Basin area (sites).

- WPAC: Nick Pisias will relay comments on this matter from WPAC's last meeting.

12. Lau Basin:

- Status: PCOM requested that LITHP formulate two scenarios for a single leg of drilling, one with and one without bare rock zero age drilling, focussing on back-arc processes.

- LITHP (p. 173):
  1. Scenario without bare-rock drilling (clearly favored)
     LG-2 (>200m basement), LG-3 (to unconformity A), LG-7 & LG-1; (LG-6 in forearc as back-up site);
  2. Scenario with bare-rock drilling
     On- or near-axis between 18-19°S, however at least 1/2 leg be devoted to drill at LG-2.

  Independent from this science program, LITHP requests devoting an engineering leg in the Lau Basin to field test new hard-rock drilling and coring systems which are under development for CEPAC drilling.

- TECP (p. 143): Solely back arc sites are viewed as addressing LITHP problems only. Arc and forearc drilling would slightly improve the situation but a more extensive multi-site program is probably required to address fundamental tectonic problems.

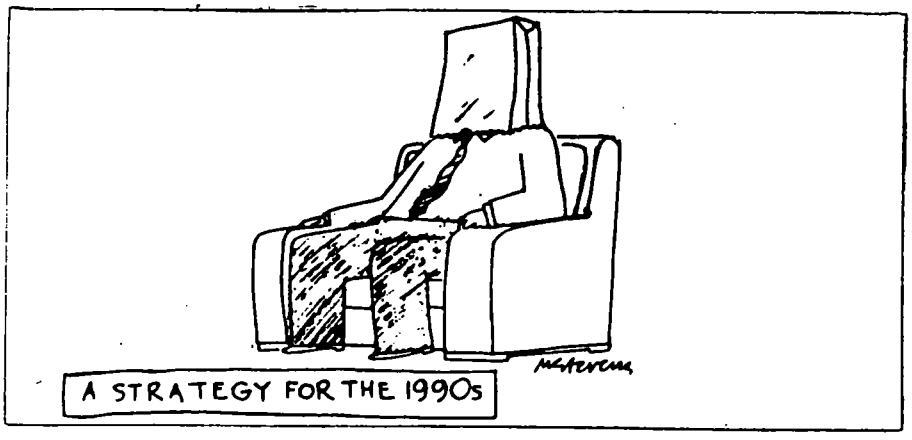
Item M. WPAC Planning, continued

13. SCS Margin:

- Status: Presently a back-up program which is further developed. Recently acquired seismic data seem to provide a deep look into the crust. An updated proposal has just been sent to WPAC and also will be evaluated by TECP at its next meeting (tentatively scheduled for early June 88).

- TECP (see p. 145): An advance draft of the revised proposal was hand-carried to the last TECP meeting for evaluation. TECP's interest in the SCS margin is growing but another revision of the proposal seems essential following specific recommendations from TECP.

- WPAC: Nick Pisias will report comments from the recent WPAC meeting.



Item M. WPAC Planning, continued

PCOM IS ASKED TO:

I. (NANKAI GEOTECH)
EVALUATE NEEDS FOR A GEOTECHNICAL PROGRAM, PARTICULARLY ENGINEERING AND DEVELOPMENT OF ESSENTIAL TOOLS (TIMETABLE ?)

II. (GEOCHEM REFERENCE HOLE)
DISCUSS AND EVALUATE THE 'MINIMUM STRATEGY' CONCEPT FOR GEOCHEMICAL REFERENCE HOLE(S) AS PROPOSED BY LITHP: ONE DEEP HOLE (BONINS) AND THREE SHALLOWER HOLES (MARIANAS) = 1 AND 1/2 LEGS

III. (SUNDA)
DECIDE WHETHER IT IS APPROPRIATE TO KEEP THE SUNDA PROGRAM ON THE DRILLING SCHEDULE AS LACK OF SUPPORT FROM THEMATIC PANELS IS OBVIOUS AND NECESSARY SITE SURVEYS HAVE BEEN CANCELED.

IV. (NORTHEAST AUSTRALIAN MARGIN)

- EVALUATE THE SCIENTIFIC JUSTIFICATION TO BE PROVIDED BY SOHP AND, IF APPROPRIATE, FORMULATE FURTHER INSTRUCTIONS TO SOHP;

- RECOGNIZE THE (LOW) LEVEL OF SUPPORT FOR THE MVT PROGRAM AS FAR AS ADDITIONAL OR 'REPLACEMENT' DRILLSITES ARE CONCERNED;

- DISCUSS THE LENGTH AND SHAPE OF THE PROGRAM (1 LEG ?)

V. (VANUATU)
EVALUATE THE REQUESTED ONE-LEG SCENARIO (to be provided by WPAC) AND, IF APPROPRIATE, FORMULATE FURTHER INSTRUCTIONS TO PANELS.

VI. (LAU BASIN)

- EVALUATE MERITS OF THE TWO 1-LEG SCENARIOS FOR DRILLING IN THE LAU BASIN (WITH AND WITHOUT BARE-ROCK DRILLING) AND RECOGNIZE LITHP PRIORITIES. IF APPROPRIATE, FORMULATE INSTRUCTIONS TO INVOLVED PANELS.

- CONSIDER LITHP RECOMMENDATION TO DEVOTE TIME (SPECIAL LEG ?) TO ENGINEERING FIELD TESTS OF NEW DRILLING AND CORING SYSTEMS FOR CEPAC DRILLING.

VII. RECOGNIZE THE INCREASED INTEREST OF TECP IN SCS MARGIN DRILLING.

VIII. MAKE PRELIMINARY EXAMINATION OF LOGISTICS FOR THE SECOND YEAR OF DRILLING IN THE WESTERN PACIFIC.

IX. CONSIDER WHETHER HIGH-RANKING CEPAC PROGRAMS IN THE W-PACIFIC SHOULD BE INSERTED INTO THE DRILLING SCHEDULE
- Ontong Java Plateau
- Jurassic Quiet Zone or Old Pacific Crust
- Shatsky Rise
- M-Series Drilling
- Marshall Island Atolls or Ogasawara Seamount
- Guyots or Geisha Seamounts

(BE AWARE OF POTENTIAL SITE SURVEY NEEDS)

ITEM N. CENTRAL & EASTERN PACIFIC PLANNING

Below is a brief summary of the top priorities of the thematic panels which where forwarded to CEPAC for consideration/ evaluation/ incorporation into the prospectus. A more complete list with 2nd highest priorities can be found in the attached minutes:

SOHP Priorities for CEPAC, 31 August - 2 September 1987, Tokyo (see p. 117)

1. Neogene Paleoenvironment	221/E	Eq.Pacific
	142/E	OJP transect
2. Mesozoic Paleoceanography	{ 202/E	Drowned Marshall guyots
	{ 203/E	Central Pacific guyots
	{ 260/E	Ogasawara Plateau
3. Sea Level: Atolls & Guyots	202/E	Drowned Marshall guyots
4. Anoxic Events	253/E	Shatsky Rise
5. Old Pacific Crust	285/E	Jurassic quiet zone
6. Fans & Sedimentary Processes	250/E	Navy Fan
7. Metallogenesis & Diagenesis	233/E	Oregon accretionary margin

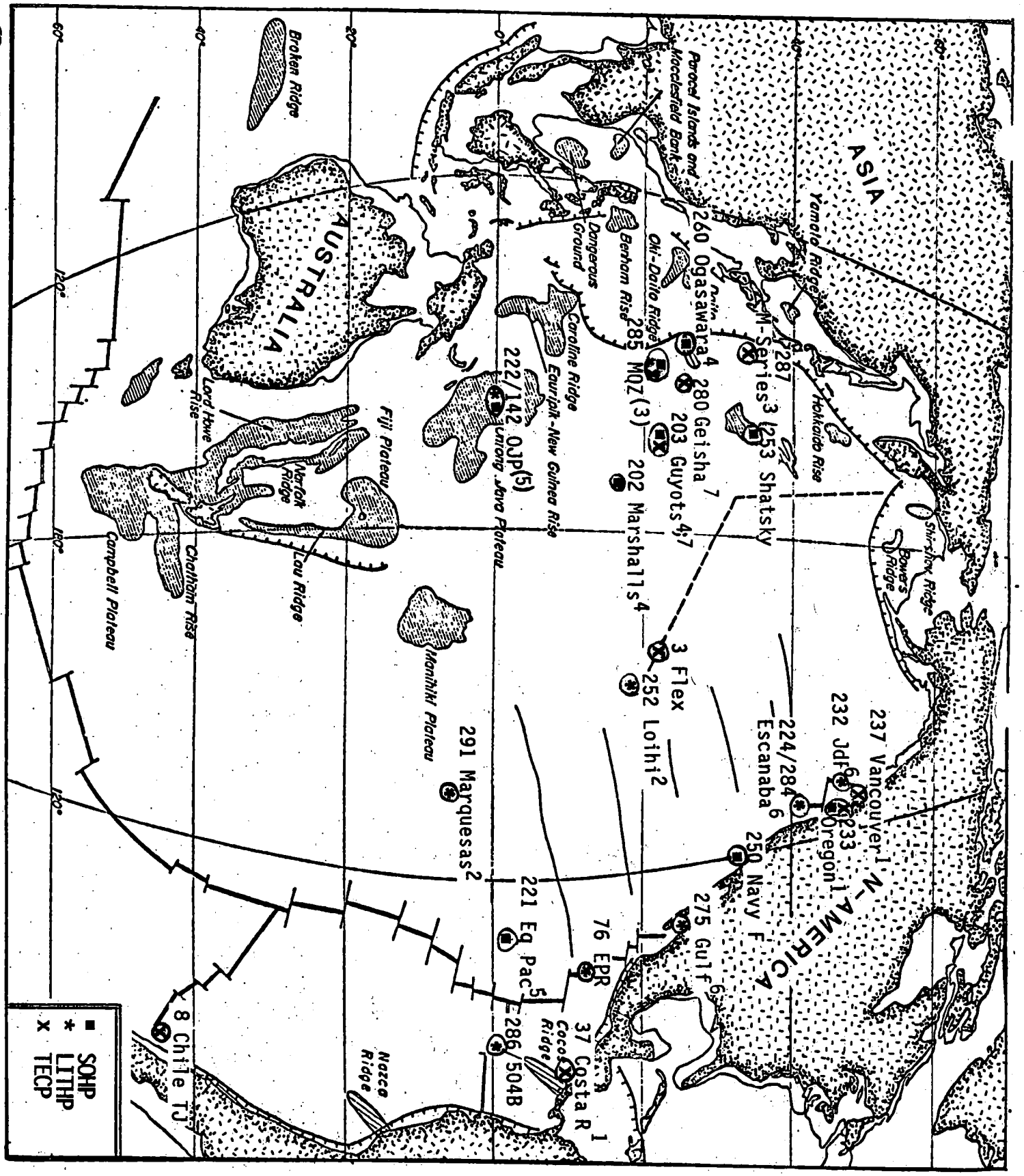
These themes are in priority order: only highest-ranked associated proposals are listed. SOHP would like to see all themes covered, taking the associated one or two top ranked proposals.

TECP Priorities for CEPAC, 27-29 September 1987, St.Moritz (see p. 139)

First priority by clear majority (no internal ranking):

* M-Series dating/calibration	285/E	Jurassic quiet zone
	287/E	M-Series drilling
* Flexure of lithosphere	3/E	Hawaii flexural moat
* Ridge - Trench Interaction	8/E	Chile triple junction
* Pre-70 MA absolute motion	280/E	Geisha seamounts
	(203/E partial)	Central Pac guyots
* Deformation in accretionary prisms	37/E	Costa Rica, duplex model
	233/E	Oregon accr. complex
	237/E	Active margin off Vancouver Isl.

Second priority themes (and associated proposals) to be addressed in conjunction with other topics are listed in the TECP minutes, p. 140.



TOP PRIORITIES OF THE THREE THEMATIC PANELS FOR DRILLING IN THE CENTRAL AND EASTERN PACIFIC:

Item N. CEPAC Planning, continued

LITHP Priorities for CEPAC, 29 September - 3 October 1987, Paris (see p. 165)

1. Structure of Lower Oceanic Crust	286/E	Deepening of 504B
2. Magmatic & Hydrothermal Processes of sediment-free ridge crests	76/E	EPR 13°N
3. Magmatic & Hydrothermal Processes of of sedimented ridge crests:	232/E	JdF
	224/E	Escanaba Trough
	284/E	Escanaba Trough
	275/E	Gulf of California
4. Early Magmatic Evolution of hot-spot volcanism	252/E	Loihi
	291/E	Marquesas
5. Crustal Structure and Magmatic Evolution Oceanic Plateaus	222/E	OJP
6. Drilling Old Oceanic Crust...	285/E	Magnetic Quiet Zone
	(261/E	Nauru Basin)

Some second ranked proposal should be further developed. In the case of theme 3 (prop. 232, 224, 284) it may be possible to combine objectives in a drilling package.

Additionally LITHP forwarded the following recommendations to PCOM for consideration (see executive summary pp. 149 and 166):

1. A minimum of 4 hard rock guidebases will be required for CEPAC.

2. An engineering test leg should be scheduled for field testing new essential equipment (Lau Basin ?).

3. One leg of hard rock drilling should be scheduled as early as possible.

4. PCOM should name a WG to develop drilling strategy for EPR and JdF.

Item N. CEPAC Planning, continued

CEPAC PROSPECTUS SUMMARY

The second prospectus provided by CEPAC contains evaluations of the following proposals:

#	Proposal	Legs	Thematic Panel	Success	Flaws / Needs
142 }	OJP	1	S	v. good	
222 }	OJP	1-2	L	v. good	MCS
261	Old Pac	1	L, S	reasonable*	MCS just acquired
285	JQZ	1	L, S, T	moderate*	MCS
202	Marshalls	1	S (T)	high	(Survey in 88)
203	Guyots	1	S (T)	high	(Survey funded)
260	Ogasawara	>2	S	more focus	MCS
253	Shatsky	1	S	low (chert)	(MCS ?)
199 }	N-Pac gyre	0.5	S, T	intermed.	{ no adequate survey
231 }	Quiet zone	0.5			{ data
195 }	Bering Sea			v. high	{ lack site
225 }	Aleutian Basin	1 ?	S		{ specific
182 }	Sounder Ridge			speculative	{ documentation
237	Vancouver	0.5	T	likely**	cross lines
233	Oregon prism	0.7	T, S	good**	MCS cross lines
232 }	JdF	1	L	good	
275 }	Gulf of Calif.			(high temp.)	
284 }	Escanaba Trough				
3	Hawaiian moat	1	T	weak***	add. seismics
252	Loihi	1	L	unknown****	
271	Calif. current	0.5	S	needs revision	
275	Gulf (part 5)	0.5	S	presently unrealistic	
76	EPR	>3	L	unknown****	poor presentation
221	Eq. Pacifoc	1	S	v. high	site spec. info
286	504B	0.5 - 1	L	some risk	(techn. problems)
8	Chile TJ	>1	T		immature proposal

---

* Only if new surveys indicate a "window" through Cretaceous volcanic cover.
** Given reasonable hole conditions at margin sites.
*** All depends on an appropriate precision in dating, which seems unlikely.
**** Bare rock drilling; technical problems have to be solved; at EPR high-temperature (success depends on achieving all three holes).

[Note: the summary has been prepared by the JOIDES office. A copy of the full prospectus is attached on p. 177.]

CEPAC would like PCOM's view as to how well the prospectus addresses the priorities defined by the thematic panels.

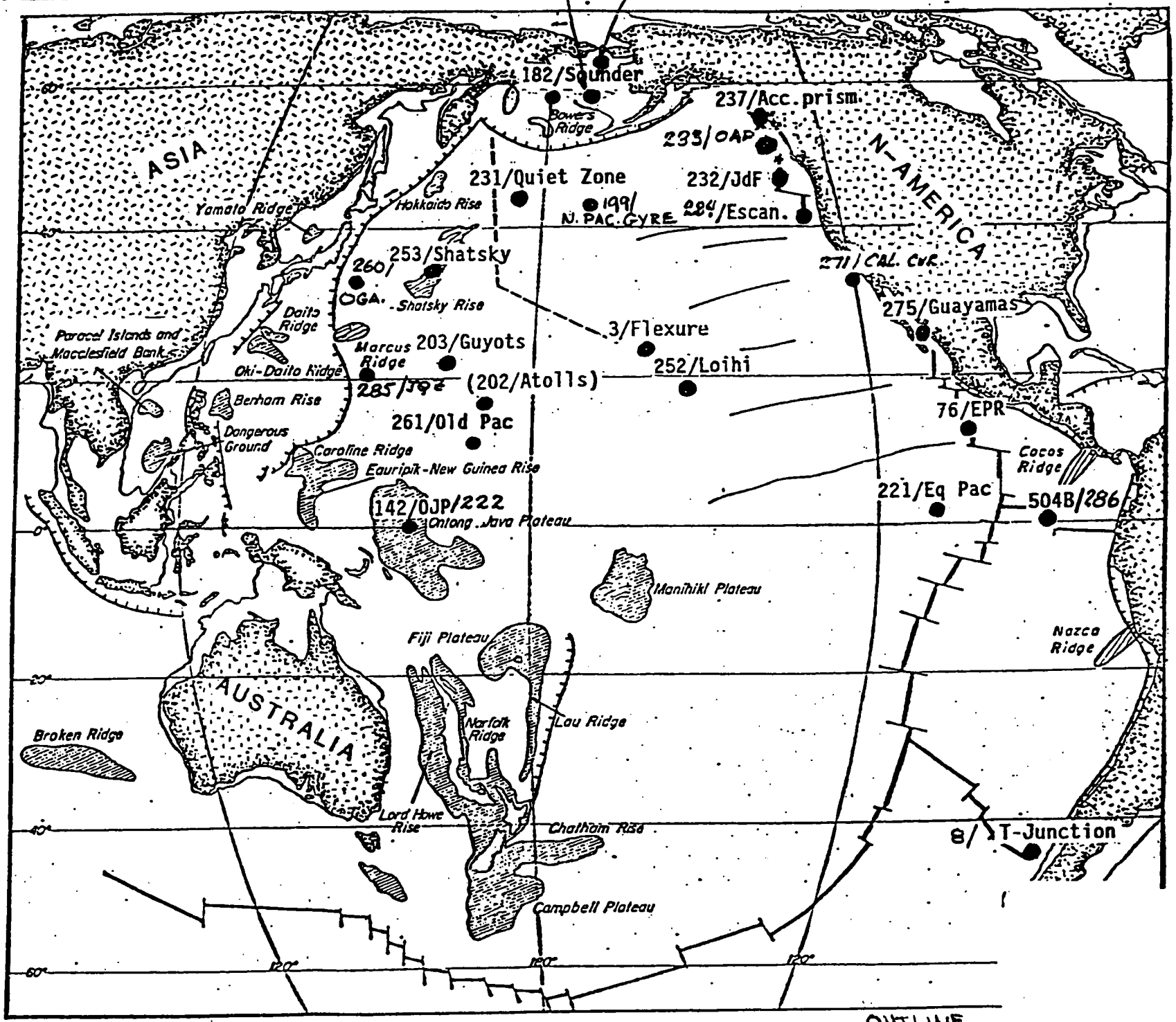


FIG. 1 CEPAC DRILLING PROGRAM - PROSPECTUS 2 OUTLINE

Item N. CEPAC Planning, continued

PCOM IS ASKED TO:

I. RECOGNIZE THAT THE PRESENT OUTLINE OF THE CEPAC PROSPECTUS COVERS CA.26 PROPOSALS AND NEEDS APPROXIMATELY 23 LEGS OF DRILLING.

II. PROVIDE GUIDELINES FOR FURTHER PREPARATION OF A CEPAC PROSPECTUS ORIENTED TO CONTAIN OPERATIONAL PROGRAMS AND THEIR TIMEFRAMES

There are a number of helpful questions:

-SHOULD THE PRESENT TIME FOR CEPAC DRILLING (1.5 YEARS) BE EXPANDED ?

-SHOULD THE LOWER RANKING THEMES PROVIDED BY THE THEMATIC PANELS BE DROPPED FROM FURTHER CONSIDERATION ?

(e.g. SOHP's #6: Deep Sea Fans; #7: Metallogenesis/Diagenesis; LITHP's # 5: Crustal Structure...; #6: Old Oceanic Crust; TECP's Flexure of Lithosphere [no appropriate dating at Hawaii])

-SHOULD THE TIME BE EQUALLY DIVIDED BETWEEN THE PRIORITIES OF THE THREE THEMATIC PANELS ?

-SHOULD A CERTAIN FLEXIBILITY BE PRESERVED TOWARD THE POSSIBILITY OF ADDING NEW IDEAS OR PROPOSALS ?

THE BOTTOM LINE SHOULD BE TO ENABLE CEPAC TO PROVIDE A PROSPECTUS CONTAINING OPERATIONAL PROGRAMS AND THE TIME FRAMES TO ACHIEVE THEM (BREAK DOWN TO LEGS).

ITEM 0. MEDIUM-RANGE SCIENCE PLAN

NSF policies require the periodic review and approval of all major programs by the U.S. National Science Board for continued support. The ODP program was last reviewed in 85 and approved for 86 through 88. It is again up for review (in the fall of 88) for the period 89 to 91.

The FY89 program plan, together with a comprehensive projection of requirements for FY90 and FY91 operations and budget, will be examined. (Note: FY89 covers the 1st year of WPAC drilling, FY90 the second year of WPAC, and FY91 roughly the 1st year of CEPAC drilling).

For this purpose NSF requests an extended science plan from PCOM which will cover these items. This 'medium-range science plan' is needed by May 88.

The first year (FY89) doesn't seem to be a problem as PCOM is already in the process of finalizing the science plan for FY89.

FY90 and FY91 science plans, however, are not yet close to a final shape. A point of discussion might be consideration of COSOD II recommendations. This may not have a strong impact on the science programs for that period of time, but may have a much stronger effect on engineering priorities (development and testing time for new tools appropriate to cover COSOD II priorities, if agreed upon).

The JOIDES Office will prepare the actual document, given that PCOM members agree on the input. The final input must be provided at the April 88 PCOM meeting. As mentioned earlier NSF needs the document in late May 88.

PCOM IS ASKED TO:

I. BEGIN DEFINING INPUT FOR A MEDIUM-RANGE SCIENCE PLAN (FY89-FY91) FOR AN AUGUST-88 REVIEW OF ODP BY THE U.S.NATIONAL SCIENCE BOARD.

II. RECOGNIZE THAT THE CONTENTS OF THIS DOCUMENT MUST BE FINALIZED NO LATER THAN THE APRIL 88 PCOM MEETING.

[NOTE: This document should not be confused with a second one, which also is requested by NSF. This second document - a long-range planning document - should include the appropriate recommendations of COSOD II. NSF needs this one in early 1989 to start preparing negotiations of MOUs for a post-1993 ODP era. This long-range planning document will be a major agenda item for the April PCOM meeting !]

ITEM P. PANEL REVIEW SUBCOMMITTEE

At the last meeting PCOM decided to start a review of the existing panel structure. A subcommittee was formed which will meet during this PCOM meeting. Its members are: T.Francis (U.K.), R.Heath (UW), M.Langseth (LDGO), M.Leinen (URI), A.Taira (Japan)

The panel review process and establishment of the subcommittee was strongly endorsed at the October, 1987 EXCOM meeting. PCOM (via Chairman N.Pisias) forwarded a set of specific instructions to the subcommittee members (see below) who will present a status report in Sunriver.

Instructions to the Panel Review Subcommittee:

1. Evaluate the present panel structure and make recommendations to PCOM on possible modifications.
2. Any proposed increase in thematic panels should be the minimal increase necessary to adequately represent the global themes addressed by Ocean drilling.
3. The role of regional expertise should be considered.
4. A final version of the subcommittee report is not expected until after the COSOD II report is available so that subcommittee recommendations can address some of the thematic problems raised at COSOD II.
5. If possible, a final set of recommendations should be available for discussion at the April meeting so that PCOM's recommendations concerning panel structure can be presented at the spring joint meeting of EXCOM and the ODP Council.

ITEM Q. WIRELINE REENTRY BY THIRD PARTIES

1. At the EXCOM meeting in Nikko B.Biju-Duval indicated that French scientist are planning to revisit DSDP site 396D in order to conduct further research via wireline re-entry. He reported that re-entry of hole 396D is planned for April 88 and asked for endorsement of this request by EXCOM. EXCOM endorsed the request, contingent on PCOM's review and approval.

2. U.S. scientists plan to revisit DSDP site 417 and conduct a wireline re-entry program.

[Note: In April 87 EXCOM adopted a motion to encourage the use of DSDP and ODP boreholes for scientific purposes by wireline re-entry.]

PCOM IS ASKED TO:

I. BRIEFLY DISCUSS AND ENDORSE THE TWO REQUESTS FOR WIRELINE RE-ENTRY OF DSDP HOLES.

ITEM R. JOIDES OFFICE ROTATION

At the end of September, 1988 the JOIDES Office will rotate to U.Hawaii (HIG). A successor for M.Wiedicke in the position of the Non-US Liaison and Executive Assistant must be selected.

At its last meeting, EXCOM directed the non-US members of PCOM to meet during the Sunriver meeting and select this person, in conjunction with the HIG representative. There are nominations from both France and Canada on the table. Details will be provided by the French and Canadian PCOM representatives.

ITEM S. PANEL MEMBERSHIP

Panel Chairmen

Three panel chairmen are resigning or rotating off their panel:

TECP:

D.Cowan will represent TECP at the annual meeting, however in 1988 he will become the U.Washington PCOM representative.
TECP's recommendation: Ian Dalziel (UT Austin)

SSP:

J.Peirce will hand over the chairmanship to his successor at the next SSP meeting, scheduled for March 1988.
Recommendation: Alain Mauffret (France)

CEPAC:

S.Schlanger will represent CEPAC at the annual meeting, but will not be able to attend the next CEPAC meeting tentatively scheduled in February 1988.
Recommendation: Connie Sancetta (Lamont)

PCOM IS ASKED TO:

I. SELECT NEW CHAIRMEN FOR TECP, SSP AND CEPAC.
II. EXPRESS ITS THANKS TO THE RETIRING CHAIRMEN FOR THEIR SERVICES.

Item S. Panel Membership, continued

Panel Membership

ARP rotating off: K.Klitgord (USGS)

nominations: J.Karson (Duke)
J.Fox (URI)
H.Dick (WHOI)

also note B.Tucholke is now official WHOI PCOM representative.

CEPAC rotating off: D.Scholl (USGS)

nominations: L.Kroenke (HIG)
R.von Huene (USGS)

S.Schlanger (Northwestern) has resigned as panel chairman. A new chairman must be appointed to preside over the February, 1988 CEPAC meeting.

SOP rotating off: D.Elliott (Ohio State)
J.Kennett (UCSB)
P.Ciesielski (U.Florida)

nominations: Corliss or Hodell
Barron or Lazarus
Domack or Krissek

SOP requests that invitations be delayed until future role of regional panels becomes clearer. SOP will not meet again until mid-1988 so membership decisions can be made at the April PCOM meeting.

WPAC rotating off: J.Ingle (Stanford)
J.Recy (at-large)

nominations: to be presented at meeting

TEDCOM Note that W.Lowe has replaced D.Wilson as the representative from the Chevron Corporation.

Item S. Panel Membership, continued

LITHP rotating off: J.Hawkins (Scripps)
C.Langmuir (LDGO)
J.Sinton (HIG)

nominations:
LITHP requests two petrologists and one geophysicist

petrologists: D.Clague (USGS)
B.Bryan (WHOI)
J.Natland (Scripps) [Note: Serves on WPAC]
M.Perfit (U.Florida)

geophysicists: J.Orcutt (Scripps)
N.Sleep (Stanford)

TECP rotating off: D.Cowan (U.Washington)
D.Howell (USGS)
B.Marsh (Johns Hopkins)
P.Vogt (USNR)

nominations:
Plate kinematics & history of ocean basisn:
D.Engebretson (W.Washington)
D.Clague (USGS) -- also nominated for LITHP
Zonenshain
T.Atwater (UCSB)
B.Luyendyk (UCSB)
R.Carlson (TAMU)
Structures in Oceanic Crust:
K.Macdonald (UCSB)
J.Fox (URI) -- also nominated for LITHP
Igneough petrology, geochemistry, isotopes:
R.Carlson (Carnegie Inst.)
Mechanical models:
R.Buck (Columbia)

Also proposed but already serving on other panels:
S.Cande (SOP)
B.Carson (DMP)

TECP requests that D.Howell and P.Vogt be allowed to attend the next TECP meeting, along with their replacements, in order to provide some continuity during the rotation of a large portion of the panel's membership.

also note that R.Riddihough (Canada) has been replaced by S.Srivastava (Bedford Institute).

ITEM T. FUTURE MEETING SCHEDULE

The next PCOM meeting was tentatively scheduled for 20-22 April 1988, in College Station (this date is in agreement with the needs of the program plan development timetable)

For the fall meeting PCOM tentatively blocked out the week of 29 August 1988, for a meeting to be hosted by the U.K.

ITEM U. OTHER BUSINESS

1. Sediment Classification Scheme:

   All questions regarding terminology have been answered in cooperation between TAMU and SOHP. After SOHP's approval TAMU has finalized the document. TAMU will provide a copy of the classification scheme at the meeting.

2. Formation Microscanner (might be covered under item G.):

   - SOHP is enthusiastic about the potential of the Formation Microscanner but requires further information on it.
   - LITHP endorses the acquisition of the Formation Microscanner based on the information that the slimlined tool will fit into the smaller diameter holes drilled with the envisioned mining coring systems.

3. Some more "small" issues from the SOHP minutes:

   - SOHP requests that IHP and TAMU check why the Japanese Paleontological Reference Center stopped receiving samples (see p. 106).
   - SOHP urges that TAMU adopt special technique (as on Leg 114) to save time during coring (30 min./core) (see p. 106).
   - SOHP emphasizes the importance for recovering material from alternating hard/soft sediment sequences in the Kerguelen (see p. 107).
   - SOHP continues to urge TAMU to resolve the problems associated with acquiring a reliable magnetic record from cores (see p. 107).

4. DMP Recommendations:

   87/21 re physio-mechanical properties (see p. 213).
   87/22 re responsibility of co-chiefs for logging (see p. 216).
   87/23 re equipment enhancements for FY88 and FY89 (see p. 219).
   87/24 re hydrofrac at AAP-1B (see p. 221).
   87/25 re responsible scientist for first FMS run (see p. 221)
   87/26 re logging for Nankai Geotech (see p. 221).

JOIDES PLANNING COMMITTEE MEETING
26-28 August 1987
Nikko, Japan

REVISED DRAFT MINUTES

Members:

N.Pisias (Chairman) - Oregon State University
G.Brass - University of Miami
J.P.Cadet - France
W.Curry - Woods Hole Oceanographic Institute (for D.Ross)
O.Eldholm - ESF Consortium
T.Francis - United Kingdom
S.Gartner - Texas A&M University
R.Hey - Hawaii Institute for Geophysics (for W.Coulbourn)
M.Kastner - Scripps Institution of Oceanography
M.Langseth - Lamont-Doherty Geological Observatory
R.Larson - University of Rhode Island
R.McDuff - University of Washington
U. von Rad - BGR, Federal Republic of Germany
P.Robinson -Canada
T.Shipley - University of Texas Institute for Geophysics
A.Taira - Ocean Research Institute, Japan

Liaisons:

T.Pyle - Joint Oceanographic Institutions, Inc.
L.Garrison - Science Operator (ODP/TAMU)
X.Golovchenko - Wireline Logging Services (ODP/LDGO)

Guests / Observers:

E.Kappel - JOI, Inc.

JOIDES Office:

S.Stambaugh
M.Wiedicke

26 August 1987

666 INTRODUCTIONS AND OPENING REMARKS

N.Pisias opened the meeting and introduced Dr.Taro Kanaya, who welcomed JOIDES participants to Nikko and the historic Kanaya Hotel. A.Taira, the PCOM host, provided logistics information. He also notified PCOM of the recent death of Kazuaki Nakamura, who served on the Tectonics Panel and was TECP liaison to WPAC.

Pisias welcomed PCOM alternates Dick Hey (HIG) and Bill Curry (WHOI). Xenia Golovchenko (LDGO) was introduced as the Wireline Logging Services liaison for this meeting (replacing Rich Jarrard who was at sea with Leg 117).

667 ADOPTION OF THE AGENDA

Agenda Item M (Publications and Information Handling Report) was moved to follow the JOI, Inc. report as items discussed at the last IHP meeting affected the FY88 budget.

PCOM Motion:

The agenda for the 26-28 August 1987 Planning Committee meeting is hereby adopted. (Motion: Brass, second Larson)

Vote: 16 for, 0 against, 0 abstain

N.Pisias read a list of handouts to this meeting (Appendix A, with subsequent meeting handouts added). Minor changes to the previous minutes were recorded.

668 APPROVAL OF PCOM MINUTES

PCOM Motion:

PCOM approves the amended minutes of the 10-12 April 1987 Planning Committee meeting. (Motion Robinson, second Brass)

Vote: 16 for, 0 against, 0 abstain

669 EXCOM REPORT

N.Pisias, PCOM liaison to the Executive Committee, reported on the 28-29 April 1987 meeting, and referred PCOM to the summary in the agenda book.

Pisias emphasized that EXCOM had endorsed PCOM's motions for setting aside 4% of each fiscal year's budget for special operations and purchases and that the standard operations budget should include on-going engineering developments. EXCOM's recommendations on ODP publications reflected PCOM's: that 1000 of the 2000 volume press run for ODP Proceedings Part A would be microfiched and that Volume B would consist of author-prepared, photo-ready copy. Although significant subsequent decisions had been made at the August IHP meeting (see JOI report), Pisias said that the scientific community would still be responsible for absorbing part of the costs for Volume B.

In closing, Pisias said that EXCOM had discussed all budget recommendations thoroughly and their votes were unanimous. EXCOM deferred to PCOM's scientific objectives for the FY88 program and tried to maintain the program within the budget restrictions. He also noted that a key EXCOM member, John Knauss (URI) would be rotating off the committee. Another key EXCOM member, Ross Heath (U.Wash), will be represented at future EXCOM meetings by alternate, Brian Lewis.

Discussion:

Robinson reiterated "strong dissatisfaction:" over the decision announced at the last EXCOM meeting regarding ODP membership to the Soviet Union. Pisias said that the telex from the U.S. government read at that meeting indicated that the membership could not be considered "at this time." Brass noted that he and John Knauss had contacted U.S. Congressional representatives on this matter. Non-U.S. EXCOM members had been notified by NSF to contact their appropriate governmental office to express their dissatisfaction with the decision, but the JOIDES Office has not been aware of any such contacts.

670 NSF REPORT

Nick Pisias read a short report (Appendix B) from NSF ODP Program Director, Dick Buffler, who is returning to the U. of Texas. Bruce Malfait, formerly at Marine Geoscience and Geophysics at NSF, will become Director of ODP at NSF and assume the role of NSF liaison at future PCOM meetings.

Discussion:

Robinson said that the initiative for Canadian/Australian joint membership has made no progress since last year and is not being pursued further. J.P.Cadet mentioned interest of a possible Asian Consortium, with Australia as a member with Taiwan, S.Korea and others, but no details were available.

671 JOI,INC REPORT

Tom Pyle reported for JOI. He distributed the new JOI brochure on the Ocean Drilling Program and asked for comments. Pyle deferred extensive comments on COSOD II until after the October meeting of the Working Group Chairmen and Steering Committee.

FY88 Program Plan

The FY88 TAMU budget cuts, as proposed by PCOM (Appendix C in April meeting PCOM minutes), were reviewed by the Budget Committee before the April EXCOM meeting. At that meeting, EXCOM adopted "the spirit of Option 4" as its recommendation for FY88:

Option 4 reductions consist of:	Est. savings:
1000 Part A and B Publications (microfiche 1000 copies)	50 K
TAMU headquarters	200
Computer services	100
HQ: 5 grad. res. assts	50
2 positions, Databases	42
Res. elec. eng., travel	88
Camera-ready Part B pubs.	171
3 Staff Scientists	143
Labs and techs.	211
	1150 K

In the final FY88 Program Plan, publications were cut as advised by BCOM, EXCOM and PCOM. JOI made adjustments in technical support, as shown in Table E-1 of Appendix C. After this iteration of the FY88 budget, the Information Handling Panel met to make additional recommendations on the publications budget. Tables E-2 and E-3 in Appendix C compare the FY88 and FY87 budgets: FY88 shows a budget increase over FY87 (less than the original request) and a decrease in personnel, mostly at TAMU.

The FY88 Program plan has been sent to NSF and EXCOM approval is pending. As PCOM did not advise JOI on specific cuts to shipboard services, the XRF/XRD & SEM labs were eliminated. TAMU has agreed, however, to try to adjust usage on the XRD/XRF lab according to individual cruise needs. L.Garrison added that no dedicated technician would be available for the lab, and that it would cost more to remove it than maintain it on a limited basis.

Publication recommendations from IHP:

N.Pisias, PCOM liaison to the 3-6 August IHP meeting, reported on developments since EXCOM's review of the publications budget. Two options were explored: reduction of publication costs and

alternatives to publishing by TAMU. A proposal from AGU for publishing ODP Proceedings Vol.B. was reviewed by IHP. In addition, TAMU personnel provided IHP with budgets for ODP publishing costs: Volume A ($618K), Volume B ($417K), other ODP publications ($90K), and other program support ($265K) for an annual total of $1.2M. BCOM did not have the budget item breakdown of these figures when it made its original recommendations to EXCOM.

TAMU Publications identified $182K in additional savings from their budget and these funds were reprogrammed to effect the recommendations of IHP (See Appendix D, Table 1). Pisias discussed the individual recommendations in Table 1 and others listed in the IHP summary. IHP recommended microfilming the ODP volumes to get a high quality master for future microfilm/microfiche runs. Cutting the estimated number of pages in Part A from 1000 to 800 was recommended because the Leg 108 volume, for instance, has only 600 pages. Pisias summarized IHP recommendations: Part B Volumes will be typeset by TAMU from manuscripts formatted for electronic capture (with author-prepared figures), two editors at TAMU will be retained, and support for data bases will be increased.

Pisias also discussed the preliminary AGU proposal, which was not pursued for several reasons: the possibility that AGU would renegotiate costs during the contract, possible continuity problems, copyright issues and the need to keep a viable publications operation at TAMU so that other ODP publications would not suffer.

Discussion:

Kastner supported the AGU proposal, citing the need to get away from "gray" literature for ODP and the potential for wider distribution for the Proceedings volumes. Eldholm said that the publications decisions from the last PCOM meeting had caused a great deal of concern to the JOIDES community; he felt the IHP recommendations settled many publication issues and urged their acceptance by PCOM. Brass, a BCOM representative at the last EXCOM meeting, pointed out that the changes made to Part B by EXCOM's acceptance of the publication budget did not affect the content, only the format of Part B. Pisias added that even before the IHP recommendations, the MOU requirements for numbers of volumes to JOIDES institutions had been met, which was one of the strongest concerns of the non-U.S. members.

Pisias and Pyle provided further details on the model proposed by AGU, although directly comparing cost figures was not possible from the format of the AGU proposal. Pisias read some of the items in the proposals, which was prepared shortly before the IHP meeting. He pointed out that an outside publishing contract would have to go up for bid, and that PCOM should not drag out

publication issues much longer.

PCOM Motion:

PCOM accepts the "spirit" of the recommendations from the 3-6 August 1987 Information Handling Panel meeting, particularly with respect to ODP Proceedings Parts A and B. (Motion: Robinson, second Eldholm)

Vote: 15 for, 1 against, 0 abstain

Discussion:

Pisias added that one AGU recommendation that was favored by IHP was to establish an editorial review board, which would consist of a TAMU editorial representative, the TAMU staff scientist, the two cruise co-chiefs and one outside scientist (to be chosen by the TAMU Science Manager in consultation with the co-chiefs). This scientist could be a proponent, a cruise participant or a regional expert, for instance. Although the manuscripts are currently reviewed by two outside scientists, this editorial board could develop better peer review and rejection criteria.

Technical Services Budget:

Pisias asked PCOM to advise JOI on its recommendations for cutbacks to technical services as shown below:

SHIPBOARD TECHNICAL SERVICES
(Lab Specific)

		Maint. & Supplies	Sal	[# Techs]	Total*
1.	X-Ray Lab	$ 59K	$ 70K	[2]	$ 129K
2.	Sem Lab	12	--		12
3.	Chem Lab:				
	a. Total	150	140	[4]	290
	b. All but Safety	50	70	[2]	120
4.	Computer Maint.	58	70	[2]	128
5.	Offices/Library/Yeopers.	31	70	[2]	101
6.	U/W Geophysics	130	--		130
7.	Paleontology	16	--		16
8.	Thin-Section Lab	5	--		5
9.	Phys. Prop.	20	70	[2]	90
10.	Paleomag.	43	70	[2]	113
11.	Downhole Tools	65	--		65
12.	Core Lab/General	--	420	[12]	420
13.	Photo Lab	--	70	[2]	70
14.	Elec. Techs.	--	140	[2]	140
15.	Superv./Lab Officer	--	70	[2]	70

TOTAL	$639	$1,260K [34]	$1,899K

*** Note: These numbers represent "full service" cost. Compromises in level of service and budget amount may be possible.**

Several PCOM members felt that reducing support for the XRF would hurt hardrock legs and reducing XRD support would hurt all legs. Robinson said that TAMU's compromise to have the XRD/XRF lab available on a leg-by-leg basis would result in difficult calibration and maintenance problems. Some members felt that through proper scientific party staffing, the labs could be used every leg, even without a dedicated technician. Pisias said that TAMU budget figures showed that $59K/year are required to maintain the XRD/XRF labs, which is not available for the coming fiscal year.

Several PCOM members felt that heave on the ship made the SEM the least useful of the tools, and that removal would not hinder shipboard science.

Pyle said that a total of $235K had been cut from technical support including XRD/XRF/SEM technician salaries. He urged, for future budget negotiations, that PCOM inform JOI on priorities for such cuts.

PCOM Consensus:

For FY88, the XRD will be available for all ODP cruises. The XRF will be available on legs for which XRF work is essential. Given sufficient notice, TAMU will try to staff cruises with invited scientists having XRF expertise such that operators will be available for these instruments.

Finally, PCOM asked that for future ODP budgets, $60K (the figure provided by TAMU for XRF/XRD lab maintenance) be set aside each fiscal year for full XRF/XRD support.

672 TAMU REPORT

L.Garrison reported for TAMU and gave updates on Legs 114 through 116, as well as the status of underway Leg 117. The co-chiefs of these legs will report further on the scientific results at the December PCOM meeting.

Garrison reported on the severe weather conditions on Leg 114 which resulted in only 1.48 days downtime. He did not feel that pipe triptime was slowed considerably on Leg 114 but recommended as much contingency time as possible be retained for the upcoming Kerguelen legs.

Garrison reported on the clearance problems with Legs 115 and 116, which were resolved with minimal loss to the science programs. At the time of this meeting, a verbal okay for clearance to drill the Oman sites for Leg 117 had been received.

Shipboard logging operations:

M.Langseth, DMP liaison, reported DMP's concern that logging time had been cut in half on Leg 115. Garrison responded that the co-chiefs were not solely responsible, as the Operations Manager knew the policy is to log all loggable holes greater than 400m deep. He said logging was a site-by-site decision on the leg and reviewed them: Sites MP 1, 2 and 3 and CARB-1 were required to be drilled by PCOM but MP 2 was not drilled due to clearance problems. MP 3 (705, 706) was shallow (121 mbsf) and not logged; Site 707 (CARB 1, 443m) was logged , but tool and bridging problems were encountered during Schlumberger runs 1 and 2 and the third suite was not run; Site 713 (191m) was not logged; and Site 715 (187m) was logged with the first two suites.

X.Golovchenko reported good cooperation with logging on Legs 114 and 116, but said the Operations Superintendent deferred to co-chief decisions on Leg 115. She said the side-entry sub (SES) was not rigged up for Leg 115 Site 707 when bridges were encountered. PCOM discussed whether ample time is alloted to use the SES when needed. Golovchenko said that the odd-numbered legs seem not to have taken time to deploy the SES; she estimated rig up time at 2.5 - 3 hours.

Garrison said that the logging policy would be reiterated to TAMU Operations Managers.

TAMU Engineering:

Pressure Core Barrel:

Garrison reported on the pressure core barrel Working Group meeting. Engineering funds have been set aside for FY88 and a prototype system is expected by FY89. The TAMU engineering group needs direction on types of data needed and testing requirements for the PCB system from PCOM. M.Kastner agreed to provide information to TAMU through the JOIDES Office. Pisias said that the pressure core barrel group who provided the initial report to TAMU would also be asked to respond.

Navidrill update:

The rotor system and flow-through latching mechanism failed on the Leg 114 testing of the Navidrill. Analysis was done by TAMU and the Clausthal petroleum engineering group and the Navidrill is expected to be modified and ready for Leg 118. U.von Rad

suggested that a test in cherts at a German testing site be done, but Leg 118 will be the "real time" test of the system.

Mining Coring System:

Work for the MCS system is on schedule and a prototype for testing could be ready in late 1988. RFPs were sent out for a design for the system and several are under consideration; return mud flow systems, weight on bit, and adequate heave compensation are of concern to TAMU engineers.

Garrison reported on recent efforts to upgrade the shipboard 3.5kHz system (mounting an array with a dome on the bottom of the hull where the 12kHz system is currently mounted). Additional work will be done on the system, if needed, during the next drydock, probably in Nagasaki during November, 1990.

ODP Clearances:

Clearance updates from Garrison indicated that the French and Australian permissions should be no problems for the Kerguelen legs. A total of eight Kerguelen sites are in the Australian-claimed EEZ. Permission to drill both primary and back-up sites for Leg 120 was requested from the Australian government in early August. Garrison noted that because Australia has provided site survey data, Australians have been invited on Legs 119 (one scientist) and 120 (probably two participants).

Leg 116:

G.Brass and S.Gartner, PCOM participants on Leg 116, provided preliminary scientific results from the leg.

Brass reported on unusual temperature inversions at Site 718. He also discussed operations problems with bit releases. At 717, a record for XCB penetration (935mbsf) was achieved. He said that recovery in sandy turbidites was poor and will have to be addressed before the Nankai legs. S.Gartner reported on the stratigraphic results. Paleontological correlations were difficult as most forams and coccoliths were redeposited; thick fan sequences (to the top of the lower Miocene) were penetrated.

673 WIRELINE LOGGING SERVICES REPORT

X.Golovchenko reported for the Borehole Research Group. Good logs were obtained during the past four months, despite mechanical and operations problems. Sites 700, 703 and 704 were logged on Leg 114. The GST tool was run through the pipe at Site 704 and lithologic units were clearly indicated. Corresponding Ca and Si signals appear cyclical, perhaps Milankovitch in origin.

On Leg 115, Sites 707 and 715 were logged. Only one complete suite was obtained from 707. Two standard Schlumberger logs were run at 715, even though this hole was shallower than 400mbsf. The section consisted of nannofossil ooze over carbonate reef , then basement; the changes in the reef structure were detected even with logging through the pipe.

On Leg 116, logging attempts were made at Site 717, but the BHA was lost with the pipe end above the seafloor and logging was not possible. The first logging attempt at Site 718 was only partially successful; after Site 719 was completed, the ship returned to Site 718, the hole was washed down and the logs completed. Successful logs were obtained at Site 719, with the changes in turbidite lithologies apparent from the logs.

Post-cruise analyses:

Spectral analyses from the Leg 113 logs are showing possible Milankovitch cyclicity, especially the obliquity signal. Work is being done on repeatability of logging results using Palisades diabase samples, and the logs are accurately picking out mineral zonations seen in the samples.

Logging tools update:

Golovchenko showed a schematic of the TAM wireline packer. Because it may not be ready for Leg 118 due to inflating problems, part of the packer will be used with Keir Becker's system on Leg 118. The U.Washington magnetic susceptibility tool will be tested on Leg 118.

A top priority for the DMP is purchase of a high resolution dipmeter for ODP use as a standard tool. This tool was originally recommended for FY87; DMP has reiterated that it is their top priority. Schlumberger can modify (slim for ODP) their existing formation microscannner (FMS) system for $160K. The DMP placed the acquisition of this FMS above the purchase of a third wireline packer. DMP felt the resolution with the FMS would be much greater than with the BHTV. Golovchenko showed overheads of two processed images from the FMS.

Discussion:

PCOM discussed possible heave problems with the FMS. M.Langseth, DMP liaison, further explained DMP's priority for this resistivity tool. He said the FMS could be used in sediments and semi-consolidated sequences whereas the BHTV is a basement tool. The FMS calipers can also determine hole orientation. Pisias explained that PCOM had accepted the third wireline packer purchase, and the FMS was the fallback tool in the DMP recommendations.

PCOM members then discussed cost/benefit of the tool, how much time would be required to run it, and the possibility of diverting these funds for additional back up tools for the ship. Langseth added that DMP "demoted" the third wireline packer for FY88 because its effectiveness has not yet been demonstrated. Golovchenko pointed out that once the standard tools are digitized, only two runs would be necessary; the reduction in time for standard runs should free up time for running tools such as the BHTV and the FMS, if purchased. Some PCOM members pointed out that a decrease in time for standard logging runs did not necessarily guarantee that more time would be available for running additional tools.

U.von Rad asked that thematic panel input be available before purchase of the FMS. Pisias agreed that SOHP and DMP should be asked for ideas on this tool as its purchase has impact on the FY88 Program Plan. Golovchenko was to provide a short summary of the FMS capabilities for von Rad to take to the SOHP meeting. She also explained the financing for the tool: $100K for FY88 would go to Schlumberger to slim the tool; an additional $60K would be necessary for FY89 completion of the modification.

PCOM Consensus:

PCOM defers recommendation on the purchase of the Schlumberger Formation Microscanner until reports from the Downhole Measurement Panel and Sediments and Ocean History Panel have been reviewed.

Logging Schools:

Logging short courses were briefly discussed. An October course is scheduled in Germany. G.Brass noted that he has submitted a USSAC proposal to schedule a U.S. school in conjunction with the spring AGU meeting. K.Becker will attempt to organize the school.

674 COSOD II REPORT

M.Kastner, COSOD II Steering Committee member, reported.

The Steering Committee and the Working Group Chairmen will meet on 19-21 October to write the introduction and synthesis chapters of the COSOD II document, which will be based on the edited "White Papers" presented in Strasbourg. The final document will be out in late 1987 or early 1988 and will consist of:

1) An introduction and synthesis by the Steering Committee;
2) The revised "White Papers" from each Working Group;
3) A paper on logging/downhole measurements from DMP;
4) One technology paper, to be written by T.Francis, which will summarize the TAMU contributions;

5) An edited version of the APC vessel paper presented by Yves Lancelot at the COSOD II meeting; and
6) A list of all participants at the Strasbourg meeting.

Each Working Group report will include major scientific objectives, required technologies to achieve them and strategies for drilling. Prioritizations of drilling programs will be included in each "White Paper" and in the Executive Summary of the final report. At the post-COSOD II Steering Committee plus W.G. Chairman meeting in Strasbourg, some W.G. Chairmen wanted additional input on drilling times and other advice from the Working Groups before ranking important objectives.

Initial requirements from the COSOD II Working Groups:

Two distinct requirements are emerging from COSOD II. Working Group 1 (Global Environmental Changes) and 5 (Evolution and Extinction of Oceanic Biota) require a global program and increased drilling time, primarily APC/XCB. Needed technology includes tools for better recovery in sediments of varying composition and degrees of induration, and higher precision logging instruments.

The other Working Groups [W.G.2: Mantle-Crustal Interactions, W.G.3: Fluid Circulation and Global Geochemical Budget, and W.G. 4: Stress and Deformation of the Lithosphere (renamed from "Brittle and Ductile Deformation of the Lithosphere")] have more focused drilling strategies. Less global navigation is needed, and with the exception of an array of geochemical reference holes, fewer sites and deeper penetrations are recommended. Major new technologies and improved drilling techniques (speed and recovery) are required.

In the COSOD II report, two options will be presented for resolving these diverse requirements for ocean drilling:

> **Option 1**: Moderately increase the present budget to allow for development of technologies for drilling holes up to three kilometers deep. Retain a single drillship - a less desirable option but probably more realistic for the next 10 years of programming.
>
> **Option 2**: Significantly increase the present budget to develop technology for up to six kilometer penetrations and to provide for multiple drilling platforms. This option is envisioned as an optimal request for the next 20 years of scientific planning.

Initial ideas for PCOM consideration:

Kastner forwarded several items from the Steering Committee

discussions with particular relevance to PCOM:

1) PCOM should recognize the existence of several fundamental differences in priorities between the COSOD II Working Groups and the recommendations of the current advisory panels.

2) The effectiveness of the present advisory structure for achieving the long-term goals set out by COSOD II must be examined.

3) The Steering Committee endorses the concept of a thematically driven program with focussed drilling plans and an advisory structure best suited for achieving it.

4) PCOM should consider the role of drilling proposals in a thematically-focused program.

5) Establish links with existing programs such as the Global Change Program, seismic networks (IRIS) and DOSECC, and also with industry.

6) Devote more time and funds for developing new tools. Routinely set aside leg time for testing of instruments and methods.

Discussion:

O.Eldholm was concerned that the Working Group recommendations would be prioritized by the Steering Committee only, and several PCOM members agreed that the COSOD II document should clearly state how and who made the final recommendations.

Robinson, a COSOD II participant, said that several Working Group 2 recommendations were not feasible (e.g.,6 km holes); he said that the LITHP white paper was a more viable document for the next five years of planning.

Pisias noted that an agenda item at the October EXCOM meeting will cover the instructions on how PCOM should incorporate the changes suggested from COSOD II. He noted that improved technology would be a major issue in achieving COSOD II recommendations. Without the COSOD II document in hand at that meeting, however, it may be too early to formulate any action by PCOM or the JOIDES panels.

675 INDIAN OCEAN PROGRAM

Leg 118

(P.Robinson, Leg 118 co-chief, was absent during this

discussion.)

Pisias made note of letters received from Robinson and von Herzen which request clarification of the directive from PCOM for the deployment of the hardrock guidebase (HRGB) if weather and logistics require alteration of the Leg 118 drilling plan. The Leg 118 prospectus stated that if weather did not permit deployment, then the second priority "pogoing" would occur. Both co-chiefs were concerned about the possibility of achieving a deep hole in the gravel pit and then having to return to the median ridge to complete the PCOM mandate of HRGB deployment, therefore sacrificing science for an engineering test.

Garrison gave TAMU Engineering's concerns. The PCOM priority of median ridge drilling presumed using the HRGB. von Herzen is concerned that, if basement is reached early with RCB drilling in the gravel pit, then a cone could be set and the drilling continued. Garrison said it was unlikely that weather problems would effect the setting of the HRGB.

At the April 1987 PCOM meeting, the following motion was passed: "To add the ten days gained through the delay of Leg 119 to the Southwest Indian Ridge Program, with deployment of the guidebase a first priority. With the additional time, the pogoing of the gravel pit is an option."

When this decision was made, PCOM considered that the 10 extra days could also be used for deployment of the HRGB if weather became a problem. In the letter from von Herzen, several scenarios were presented that discussed the operation plan of the leg in the event that weather did not allow deployment of the HRGB as outlined in the leg prospectus.

Garrison presented possible trade-offs in the scenarios from von Herzen, adding that the HRGB has been modified since the last use and approximately five days would be needed for a full engineering test of the HRGB itself. He presented figures compiled at TAMU Engineering which indicated that a total of $515K had been spent in FY87 on engineering and development costs (such as coring motors and bits) for the HRGB. Pisias added that the test would require TV surveying and spud-in time, and a total of between 9.3 to 15 days was a more realistic timeframe. However, this time would be committed at the beginning of the leg and could be completed in more severe weather than the setting of the HRGB.

PCOM discussed the various options for setting the HRGB and pogoing, and the following motion resulted:

PCOM Motion:

If weather conditions permit, a full engineering test, of 15 days duration, for the hardrock guidebase and drilling

system will be conducted on Leg 118. (Motion: Larson, second Brass)

Vote: 13 for, 2 against, 0 abstain, 1 absent

Discussion on whether the TV will be properly heave compensated followed this motion.

Leg 119:

L.Garrison provided an update on the safety review for the leg. The PPSP reviewed not just recommended sites, but large sections which could be safely drilled as backup. Drilling depth will be limited to 500m. Procurement of the Maersk Master for ice support is complete and the logistics are underway for the leg. He said that R.Schlich (IOP Chairman) had asked for a slight variation to PCOM's adopted drilling plan for the leg. Schlich proposed setting a re-entry cone at KHP-1 so as to have the option to return, if time allows, to get a deeper basement section since PCOM had not included basement site KHP-3. TAMU has no problems with this plan.

Nominated co-chief, K.Hinz, is unable to participate on Leg 119 and Birger Larsen (ESF) has been invited. J.Barron is the other co-chief. Staffing is underway for the cruise. Garrison said that the iceboat would be available for the southernmost Kerguelen site, as well as Prydz Bay, and will be released as soon as ice conditions permit.

PCOM Consensus:

PCOM endorses the addition of two days to the Leg 119 program as outlined by TAMU (because of Freemantle port call logistics) and setting of a re-entry cone at KHP-1.

Auxilliary science:

PCOM discussed proposed auxiliary science on the iceboat to be conducted during Leg 119. These are NSF-funded programs for sediment trapping and plankton studies. Garrison explained that TAMU had no objections and any extra fuel charges would be billed to USSAC. Some PCOM members were concerned that the auxiliary science programs were not solicited programs and suggested that future programs should be opened to the scientific community.

PCOM Motion:

PCOM approves the auxiliary science program (NSF-funded plankton and sediment trapping studies) scheduled to be conducted on the Leg 119 ice support vessel. (Motion Brass, second Langseth)

Vote: 16 for, 0 against, 0 abstain

Leg 120:

Garrison reported that R.Schlich (F) and S.Wise (US) had been selected as co-chiefs. SKP-2 target depth has been re-estimated at 1000-1300 mbsf from the original 700m depth. If SKP-3 is dropped for safety reasons, then Schlich recommends setting a re-entry cone at SKP-2, which has been accepted by TAMU. The safety review for the Kerguelen sites has been rescheduled for October.

Leg 121:

No changes were proposed to the program accepted at the last PCOM meeting for this leg. New site survey data has been processed and is now available for the south 90ER sites. There is time on the leg to drill all three 90ER sites and the four Broken Ridge sites.

Garrison noted that the termination port call has been changed to Singapore. Total leg time is now estimated at 54 days. He said that two days for testing of the mining coring system are scheduled if all of the scientific objectives have been met for the leg.

P.Robinson supported the addition of at least two days contingency time to all legs for such testing, if possible. Some PCOM members were concerned with co-chief decisions and how co-chiefs determine whether objectives have been sufficiently met. Garrison noted that the Navi-drill testing on Leg 114 was an integral part of the leg science but, that in some cases, engineering tests would be in addition to science. Pisias said that PCOM has the obligation to set aside extra days for testing that is separate from contingency time for weather and other possible delays.

PCOM Consensus:

PCOM agrees that two or three days contingency time are warranted for Leg 121 in order to test the mining coring system.

Leg 122:

(U.von Rad was absent during the discussion of this leg as he is a proponent of this program and has been suggested as a co-chief by some panels.)

A new estimate of drilling times for this leg was forwarded by U.von Rad at this meeting (Appendix E). PCOM members discussed the prioritizations of the Exmouth Plateau sites. In von Rad's revised summary of sites, it was stated that the proposed site EP12 will have better success than EP2. McDuff noted that DMP has recommended standard logging for this leg, although high

resolution seismic work is desirable if the new digital sonic tool is available. A total of 53 days (42 for operations, 11 for transit) are currently planned. Pisias clarified that EP12 addresses the same objectives as EP2 and new site survey data suggest it will be a better site.

Co-chief recommendations for this leg appear in Appendix F.

Leg 123:

At the last PCOM meeting, Leg 123 was scheduled to drill one Exmouth site (EP9B) and the Argo Abyssal Plain site (AAP1B). Pisias reported that the LITHP was particularly pleased that the Argo Abyssal Plain site was included on the Indian Ocean schedule. R.McDuff presented the DMP recommendations for the leg (developed at the August DMP meeting):

Site AAP1B: BHTV, VSP, hydrofrac testing, magnetic susceptibility tool run in basement section.

The SSP has noted that PPSP may find a safety problem with EP9B, and EP9[illegible] has been suggested as a default site. [Note: PPSP meets 6-7 October 1987 and will make its recommendations on the safety of site EP9B.]

Pisias reiterated that double coring of the Mesozoic section is not supported by the advisory panels. He stressed that old basement is a leg objective; Larson added that the chert problem in the Western Pacific make this the best site for recovery of very old oceanic crust.

Garrison reviewed the times for this leg: 10 days for the Exmouth site, 32 days for drilling and downhole measurements at AAP1B, 8 days for transit and 2 days contingency time (total 52 days); however, the available time for this leg is 56 days. PCOM also discussed the possibility of losing a deep hole at AAP1B, and, therefore, possible backup programs.

PCOM Motion:

> Leg 123 is scheduled at 56 days, including transit. EP9B (or EP9[illegible] by default) will be drilled and the remaining time will be devoted to a deep hole at AAP1B. If this basement hole is lost, Site AAP2 is a backup site. The full logging program recommended by DMP (including the hydrofracture experiment) will be run at AAP1B (or AAP2 by default). (Motion: Robinson, second Brass)
>
> Vote: 15 for, 0 against, 0 abstain, 1 absent

Co-chiefs nominated by PCOM for Leg 123 appear in Appendix F.

[Note: Garrison provided updated drilling times based on the

revised program: 31 days to drill ca.250m into basement at AAP1B, 10 days for the logging program, 9.3 days for EP9B, and 8 days transit, for a leg total of 58.5 days.]

676 WESTERN PACIFIC PLANNING

Pisias opened the discussion. He reminded PCOM that a firm FY89 drilling program must be finalized at the Annual Meeting in December of this year. PCOM watchdogs were assigned to each of the top-ranked programs at the April meeting. Summaries of the programs, based on the WPAC Third Prospectus and pertinent proposals, were provided by the PCOM watchdogs before and during this meeting. The PCOM consensus items listed below were formulated and reviewed by the panel members and were included in a letter (Appendix G) to the Thematic Panel Chairmen and the Western Pacific Panel Chairman.

Banda-Sulu-S.China Sea:

G.Brass gave an overview of the objectives of the program. Concerns from Brass and PCOM included:

* Need for a unifying tectonic theme to address the ages of the basin openings and the structure and age of the crust between China and Australia.
* Many holes are proposed for 80-90 days of drilling; PCOM wondered if a reduced program could achieve the broad number of objectives in the area.
* The complexity of area, as evidenced in the magnetic anomalies, and whether limited drilling would address plate development, were discussed.
* Brass recommended a one-leg program consisting of one hole each in the Banda, Celebes and Sulu Seas, plus two in the S.China Sea, as a program which would address the first-order tectonic objectives.
* A "reconnaissance" leg in the area was suggested as DSDP did not drill in this complex area.
* The thematic panels should review the possibility of a hole in the Celebes Sea.

PCOM Consensus:

PCOM feels that this program does not warrant more than one leg of drilling. PCOM feels that one leg would provide first order information on thematic problems related to the ages of these basins. PCOM requests WPAC to prepare a single leg program for this transect. PCOM suggests that the program should consist of one South China Sea Basin site, one Sulu and one Banda Sea site (with the latter sites being located on oceanic crust). For PCOM to consider more

than one leg for this transect, WPAC must provide a well defined justification for drilling beyond one leg. A Celebes Sea site might be considered as part of this one leg program.

Sunda:

T.Francis gave an overview of the area and the scientific objectives. Concerns from Francis and PCOM included:

* The #9 ranking as a collision process leg by TECP
* Whether drilling results from the F1 and F2 sites can be used to time the thrusting and Australian collision
* The lengthy drilling time proposed.
* The late site surveys for the leg (less than a year before the leg could be scheduled).
* The amount of basement drilling proposed (about 68 days) and the short amount of time alloted to logging were discussed.
* New information (via a letter from D.Cowan, TECP Chairman, to E.Silver, a proponent) on the possible relocation of sites closer to Timor for a better relation of backthrusting in that area to the collisional process.
* Availability of Gloria data and possible postponement of the leg to follow the Japan Sea program.

PCOM Consensus:

Because of the low ranking by the thematic panels and the uncertainties about whether this leg can address collisional processes, PCOM cannot consider this leg for the FY89 program. However, if the planned site survey data and the proponents provide the TECP with justification that drilling in the Sunda region can adequately address collision processes, PCOM is willing to consider this leg for drilling beyond FY89.

T.Shipley expressed "amazement" that PCOM was making such constructive decisions.

S.China Sea Margin:

A.Taira gave the overview of the area and problems addressed there. Concerns from Taira and PCOM included:

* The proposed study area is an interesting passive margin with 30Ma crust and thin sediment cover; the area is complicated , however, by large nappe structures and may not be the best area for study of arc-backarc evolution and thermal history.
* The Western Pacific is better for active margin study
* New seismic data (with deep imaging of crustal structure)

will soon be available and TECP may re-evaluate the program.

* This area may be the most accessible for drilling a back arc basin.

PCOM Consensus:

The South China Sea Margin continues not to be included in the WPAC drilling schedule. However, PCOM recognizes that new geophysical survey data available for this region, may result in a change in the thematic panel's ranking of this program.

Bonins:

P.Robinson provided an overview of two legs proposed for the Bonin arc. Concerns and comments from Robinson and PCOM included:

* These programs integrate tectonic themes well in simple systems.
* The Bonin 1 program (Sites 1,2,5A,and 5B) addresses back and forearc progression and represents a solid leg of drilling.
* The Bonin 2 program (Site 7 diapir site, Marianas 2&3, and a Bonin reference site) is more problematic.
* LITHP is concerned with the proposed diapir drilling and whether the ridge itself is a better location.
* Drilling at least one diapir site to obtain information on hydrothermal fluids and alteration seemed a worthy objective; the Pacman seamount seemed a better choice if one is to be drilled.
* PCOM generally agreed that the Marianas sites be dropped.
* A better strategy for the proposed geochemical reference site at Bonin 8 is needed. PCOM agreed to deal with the reference site separately.
* The length of time to drill Bonin 6 (24+ days into basement) requires this site to be part of a second leg in the Bonins.

PCOM Consensus:

The Bonin program (Site BON 1, 2, 5a, 5b and 6) is considered by PCOM to be worthy of one and a half legs of drilling. TECP and LITHP are requested to provide scientific objectives which can be addressed with an additional half leg of drilling and their scientific justification. Specifically, PCOM requests scientific justification for drilling diapirs and/or the forearc terrace in the Bonins.

Geochemical Reference Sites:

Because the Bonin program encompassed geochemical reference sites, P.Robinson also watched these dogs. Comments and concerns included:

* How to identify contributions to arc lavas from the components in the down-going slab and what tracers would be useful.
* A general review of proposed sites for a geochemical reference site (DP1, Marianas 4 and 5, Bonin 8 and 9).
* The need to drill a site in front of a well-studied arc was emphasized and whether results from a single site would be applicable to subduction zones elsewhere.
* TECP and LITHP views, as well as initial COSOD II remarks, views on reference holes were discussed. Robinson said that LITHP strongly endorses the concept in order to start understanding the problem.
* Whether an area with possible magma contributions from seamounts is an appropriate study area or if a simpler system is needed.
* A minimum strategy, comparing single deep holes versus several shallow holes, should be formulated.

PCOM Consensus:

PCOM requests that LITHP provide the minimum strategy necessary for obtaining a reference hole(s) for the Bonin system. PCOM feels that the Bonins are the most appropriate place for drilling a geochemical reference hole(s). However, justification of drilling strategies are needed from LITHP.

Nankai :

M.Kastner reported on these programs and gave an overview of the proposals. (A.Taira, a proponent for Nankai, was not present during the discussion.) Comments and concerns of PCOM included:

* Whether the geotechnical leg is justifiably separable from the active margin and forearc basin program.
* High ranking from only TECP, not SOHP or LITHP.
* The interaction between hydrogeology, geochemistry and tectonics is not addressed by existing proposals: Is this a lost opportunity?
* Two deep sites are proposed by WPAC (NK1 and NK2). Kastner felt much science was lost in reducing the program to one leg; she suggested that as many as five to seven holes (to include NK1 and NK2) would be necessary to address fluid regimes, anisotropy, deformation and physical properties of sediments in the area.
* Problems similar to those on DSDP Leg 87 in penetrating the decollement and in recovering core may be encountered.

PCOM decided that a report on the geotechnical leg was necessary before a consensus could be reached concerning the Nankai program.

Nankai Geotechnical Program:

R.McDuff, watchdog, reviewed three elements of the program: 1) a series of special experiments contained in the Taira proposal, 2) the GEOPROPS probe proposal by Karig, and 3) the Japanese proposal for three years of temperature monitoring in the hole. Concerns and comments from PCOM and McDuff included:

* The Karig tool has only recently been funded by NSF and relies on the untested Navi-drill technology.
* TECP is still unsupportive of a separate hole for the geotechnical program.
* Downhole measurement time estimates are lengthy (13 days for NKT1 and 20 for NKT2). An oblique seismic experiment recommended at NKT2 has no identified proponent. Eleven days are devoted to the untested GEOPROPS probe.
* The DMP is concerned about leaving behind the temperature monitoring devices and whether the hole can be used for subsequent re-entries.
* A major concern of PCOM is whether the tools would be available for a FY89 program.

R.Larson, watchdog for the Zenisu program, thought its objectives needed to be considered in context to the Nankai program.

Zenisu:

R.Larson reviewed the tectonic setting of the Zenisu Ridge in relation to the Nankai Trough. Concerns from Larson and PCOM included:

* Drilling in Zenisu may be needed to understand the timing and deformation relative to the main zone of crustal shortening.
* Only proposed sites ZE1 and ZE3 are recommended in order to constrain timing of the ridge formation; Larson considered the ZE3 site the more important if only one is to be scheduled.
* If the tectonics in Nankai are the most important objective, then Zenisu could be an important component.

PCOM Motion:

a) PCOM approves the Nankai Trough leg (NKT-1 and NKT-2) as presented in the WPAC Third Prospectus;
b) PCOM would consider at a later date (beyond FY89) a second leg which could include extensive geotechnical studies, downhole measurements and Zenisu Ridge drilling.

The thematic panels, especially SOHP and TECP, should examine proposed sites along the Nankai transect (NKT-3, NKT-5 and NKT-7) for possible development of a program to examine hydrologic processes in this accretionary prism.

PCOM recognizes that the Zenisu Ridge is part of the tectonic setting of the Nankai region. (Motion Brass, second Larson)

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

Gartner forwarded a motion to vote separately on the recommendations contained in the above motion, but it was not seconded. Taira returned at the close of these discussions.

Japan Sea:

M.Langseth, watchdog for the highly ranked programs in the Japan Sea, gave an overview of the area and reviewed the proposed sites. Eight separate proposals were effectively merged as many used the same sites. Concerns and comments from Langseth and PCOM included:

* The area is tectonically complex but because it has been extensively studied, has much available data (with the exception of the NW Japan Sea).
* Logging times were included in the prospectus, but extensive downhole measurements, including temperature at all sites, seemed appropriate.
* Vertical seismic profiling has been recommended at Site J1-B, along with oblique seismic and geoelectric logs, BHTV, magnetometer, and standard Schlumberger. Whether enough time is available for the downhole program at this site and at J2 and J2A was discussed by PCOM.
* THe balances and imbalances of the program were discussed. THe program has much basement drilling; Sites J3A, J1A, and J2A were discussed in context of how rifting and rotation in the southern section could be determined. Langseth recommended that J3A be a re-entry site for stress measurements.
* Site Surveys: Cross lines are needed at the basin sites. Yamato Basin surveys should be reviewed to determine the what kind of crust underlies the area. Improved digital SCS is recommended for Site JS-2, but it could be drilled on the existing data.

PCOM Consensus:

PCOM accepts the one and one-half leg program in the Japan Sea as presented in the Western Pacific Third Prospectus.

Northeast Australian Margin:

This program, formerly referred to as the Great Barrier Reef program, was reviewed by PCOM watchdog, S. Gartner. Pisias noted that the recent review by the Site Survey Panel was not

encouraging, but problems may have been overstated. Proponents Davis and Symond informed PCOM by telex at this meeting that a new cruise for high quality survey work was being planned.

Gartner reviewed the geologic setting of the area. Concerns and comments from Gartner and PCOM included:

* The episodic nature of the subsidence of the carbonate platform since the Cretaceous will make it difficult to separate out the effects of eustatic sea level changes.
* Some PCOM members felt too many sites have been proposed. SOHP has indicated that two transects are needed to separate subsidence histories precisely for determining the sea level effect. A major concern was voiced that the overlap of the sequences occurred only in the mid-Miocene and separation would be impossible.
* Gartner noted that SOHP ranks the program highly because it is a mixed carbonate/siliciclastic regime.
* PCOM needed more definition of the phrase "diagenesis in an undersaturated ocean regime" as used in the Prospectus.
* Gartner pointed out that a major objective of the program is to determine why the extensive reef buildup stopped as subsidence alone was not fast enough.
* Some PCOM members thought Sites NEA1 and NEA2 had similar objectives. These sites, along with NEA3, are in a national park and drilling clearance will be an issue.
* Gartner confirmed that the program remains SOHP's first priority in the Western Pacific, although some PCOM Members still question it.
* PCOM briefly reviewed the Mississippi Valley Type deposits proposal submitted as an "add-on" to the program. WPAC did not insert the program because SOHP did not rank it highly. PCOM discussed the merits of studying the dynamics of the fluid flow system in the area even if MVT mineralization is not actually occurring.

PCOM Consensus:

PCOM requests that SOHP provide PCOM with the specific objectives and their justification of this program, which holes address these objectives and how these holes provide the necessary data to achieve these objectives. Specific concerns expressed during the discussions include how the effects of subsidence and sea level changes are going to be identified/separated. PCOM also found that some of the objectives listed in the WPAC Third Prospectus to be unclear and requests that the SOHP provide clarification.

LITHP is asked to provide its evaluation of the Mississippi Valley Type Deposits Proposal (268/D) for PCOM.

Vanuatu:

J.P.Cadet, PCOM watchdog, presented background on this proposal to study collisional processes and reviewed the proposed sites. Comments and concerns from Cadet and PCOM included:

* New French seismic data from the Bougainville Guyot is currently being processed. Good site surveys exist for the program in general (MCS, SCS and Seabeam).
* There is little sediment cover near the DEZ4 site for spud-in. Site surveys scheduled in winter of 1988 may help site location.
* The basin sites (Aoba and Coriolis) will address how the basins opened in response to collision. Less clear is how the D'Entrecasteaux Ridge reference site will address the collision.
* THe lack of data from the Coriolis Trough make it a less convincing site for backarc study. No heat flow measurements exist from the Aoba Basin or the Coriolis Trough.
* Total time for the leg, as proposed, is two legs.
* Arc reversals are important in the area and it should be documented how timing will be constrained.

PCOM Consensus:

PCOM presently considers this program to be a single leg of drilling. PCOM feels that the D'Entrecasteaux Ridge and Aoba Basin sites address an important thematic process and are of highest priority. The sites in the Coriolis Trough and also site BAT-2 are considered to be of lower priority. WPAC is asked to provide PCOM with a single leg program for this region.

Lau Basin:

U.von Rad, PCOM watchdog for the program, presented an overview of this young, actively spreading back-arc system. Comments and concerns from von Rad and PCOM included:

* The dredging of zero-age volcanics should help in location of the N.Lau spreading ridge; the Valu Fa system is a different type of volcanism, possible influenced by island arc magmatism.
* LG 2-7 (central Lau Basin) is a well-surveyed transect. LG4 has associated hydrothermal activity.
* The area has been well-surveyed, by groups from France, the U.S., Germany, and Japan. The current proposal represents contributions from five ODP member nations and seven individual countries.
* More SMCS work is suggested for the LG1, 2 and 7 transect. The success of this transect depends on the interpretation by proponent Hawkins of what type of basalt volcanism is

present.

* Sediments are thin in some areas and drilling at LG1 (in a ponded basin) may not reach MORB-type basalt.
* The complexity of the area was discussed, ironically, in context of the wealth of data available. Some PCOM members felt that a single leg could not unravel the chronology of the spreading. The viability of the magnetic anomalies recorded in the area were discussed.
* In general, PCOM liked the back arc objectives of the leg.
* PCOM must know soon if barerock drilling will be involved.

PCOM Consensus:

At the present time, PCOM considers the Lau Basin to be an important region to examine backarc processes, specifically to examine volcanism and its relationship to the tectonics of the backarc. Drilling in the Lau region should focus on backarc processes. LITHP is asked to formulate two scenarios for a single leg of drilling; one leg without drilling on bare rock and one leg drilling on bare rock zero age crust. Specifically, LITHP should provide the scientific objectives for each of these scenarios and describe the relative merits of each. We wish to endorse the LITHP's recommendation that this program should be focused, and thus consider drilling the forearc not of prime importance.

TECP is asked to provide LITHP and PCOM with their views on the tectonic objectives to be addressed in the Lau backarc.

The Chairman concluded the deliberations on the Western Pacific with thanks to the "watchdogs" for their thorough reports.

[Note: PCOM subsequently agreed to continue the assigned Western Pacific watchdogs. The following switch was made to avoid any potential conflict of interest: M.Langseth for the Lau Basin and U.von Rad for the Japan Sea.]

28 August 1987

676 WESTERN PACIFIC PLANNING

"Strawman" schedule for Western Pacific:

A strawman schedule was devised by Pisias and Garrison, using rankings of the programs, weather windows, and maturity of site surveys (Appendix H). Pisias made arrangements to get the results of the Western Pacific planning to the thematic panels and WPAC

as soon as possible. The draft memo for WPAC and the thematic panels was prepared the evening of 27 August and discussed the next morning. Minor modifications were made and the letter (Appendix G) was to be hand-carried to appropriate panel chairmen by responsible members of PCOM.

677 EVALUATION OF ODP ADVISORY STRUCTURE

The Chairman opened the discussion on evaluation of the JOIDES panel system. He said it was important for PCOM to utilize the panels effectively so that planning, such as the previous day's dissection of the WPAC program, could also be effective. The thematic panels had been asked to provide PCOM with their views on the current structure for consideration at this meeting.

Issues of concern to Pisias were: approval of "off-season" panel meetings, early feedback to proponents, and possible implications of COSOD II on the current panel structure. He wanted to accurately represent PCOM's views at the October meeting of EXCOM, at which panel structure and a proponent-driven program will be discussed. Pisias presented a "flow chart" he recommended as a model for PCOM to consider (Appendix I).

Discussion:

G.Brass supported the model presented by Pisias and wondered if regional input could come from working groups instead of standing panels. He endorsed an "evolutionary, not revolutionary" approach to panel structure changes. Brass said that the proposal-driven concept did not work as well for broad thematic programs (e.g. global stress map and deep stratigraphic tests), but it ensured the openness in the program to non-JOIDES institutions and the scientific community at large.

M.Kastner presented viewpoints on both the current system and recommendations for a future system. She felt too much overlap existed between regional and thematic panels and recommended: retaining the thematic panels; inviting "regional experts" to the thematic panel meetings, when warranted; and increasing the scope (and possibly the number) of thematic panels. For a future system, she recommended:

1) appointing a subcommittee within PCOM to draft an expanded thematic panel system;
2) having PCOM as a whole vote on the subcommittee's suggestions and then revise the draft;
3) presenting the revised draft to the existing thematic panels for comment;
4) having PCOM then review the panels' suggestions. A final draft would be written by the subcommittee;and

5) presenting a final draft to EXCOM.

In reference to the upcoming CEPAC prospectus, Kastner suggested that the thematic panels prepare a prospectus for review by PCOM. PCOM would then send the prospectus to CEPAC for further evaluation. One more review by the thematic panels would be sent to PCOM for approval.

PCOM discussed the various proposals for the advisory structure, in particular, the role of regional panels as "proponents". Robinson suggested that expanded thematic panels and the Panel Chairmen structure be used to produce drilling prospectuses. Brass pointed out that PCOM had effectively used proposals and its own watchdogs to produce the six-leg Western Pacific schedule the previous day.

U.von Rad felt that data holders (e.g. site survey participants) should somehow be involved in the panel structure. O.Eldholm thought PCOM should be careful not to restructure the system without considering the contributions from the scientific community outside of JOIDES institutions. He also did not want to see a proliferation of thematic panels.

The various suggestions on advisory panels structure resulted in the following motions:

PCOM Motion:

PCOM should appoint a subcommittee, to include four PCOM members (2 U.S., 2 non-U.S.) plus EXCOM member, Ross Heath, who will consider and provide a draft of a revised JOIDES panel structure. (Motion Kastner, second Robinson)

Vote: 16 for, 0 against, 0 abstain

Pisias said he would try to draft a charge to the subcommittee (Appendix J) and thought PCOM had provided good information for presentation to EXCOM.

PCOM Motion:

PCOM accepts the solution presented by the Chairman (page 269 of the meeting agenda book and Appendix I attached) as the interim organization structure until a new panel structure is adopted. (Motion Brass, second Francis)

Discussion:

PCOM members discussed the interim solution especially with reference to CEPAC. Pisias said that the first input on a proposal should come from the thematic panels, and the regional panels should deal with the probability of success for given programs. He added that thematic panels currently look at proposals in depth (e.g. some assign watchdogs to proposals).

PCOM agreed that major thematic issues should take precedence over "interesting problems."

Vote: 16 for, 0 against, 0 abstain

Discussion:

PCOM briefly discussed the situation of inactive panels (e.g. ARP). Unless the PCOM has specific questions of these panels, the Chairman suggested that meetings not be scheduled. PCOM concurred, but some members thought that inactive regional panels should provide long-range plans for their areas, thus should not be totally shut down.

The impact of the "interim solution" on CEPAC was discussed. PCOM agreed that CEPAC should develop a prospectus with programs previously defined by the thematic panels (see Central Pacific Planning below.)

[Note: PCOM also agreed to add the wording "probability of success" to the interim solution approved in the previous motion. See Appendix I which includes the rewording.]

ODP Proposal Process;

PCOM discussed a "proposal-driven" program for ODP and how the interim structure would change the current process. Robinson felt that it would be difficult for an individual scientist to propose a broad thematic program. He suggested that PCOM and the thematic panels solicit proposals for important themes or develop them.

Kastner did not think a proposal-driven program would serve the long-term needs of ODP. Brass felt that the process should not be over-structured; he felt the thematic panels already operated much as described in the proposed interim solution. von Rad brought up the time lag factor for site surveys and whether the system would prejudice an interesting program just because the site survey is late. Pisias responded that a proposal is still the tool for considering a program, and new data should support a well-established scientific theme. He gave the example of Hole 504B as a program that has evolved with new data and continues to support thematic proposals.

PCOM Consensus:

PCOM agrees that ODP will remain a proposal-based program.

Discussion:

PCOM discussed the membership of the Panel Advisory Structure Subcommittee and details of scheduling of meetings. [Note: The following PCOM and EXCOM members were asked to serve on and have

accepted membership to the Subcommittee: G.Ross Heath, EXCOM; A.Taira and T.Francis, non-U.S.PCOM members; M.Langseth and M.Leinen (rotating onto PCOM for URI), U.S. members. See Appendix J.]

Pisias asked that PCOM consider adopting the process shown in Appendix K in order to keep proponents aware of possible deficiencies in their programs, as noted by the panels, so they have the opportunity to update them.

PCOM Consensus:

PCOM approves the form (page 270 of the agenda book and Appendix K attached) as a method for the panels and the JOIDES Office to keep proponents better informed on the status of their ODP proposals.

678 ADDITIONAL IHP RECOMMENDATIONS

Part A Proceedings Recommendations:

PCOM discussed additional (not FY88 budget related) recommendations from the IHP meeting in August (Appendix D) as well as addressed some concerns of the SSP that site survey data be included in the ODP Part A Proceedings.

PCOM Consensus:

PCOM supports including summaries from pre-drilling site survey data in ODP Part A Proceeding volumes, whenever possible.

The above consensus assumed that the site survey chiefs would be bound by the same post-cruise publication restrictions agreed upon by ODP co-chiefs.

PCOM Consensus:

PCOM encourages publication of a preliminary scientific summary in the ODP Part A volumes, as was done in the Leg 104 volumes, whenever possible.

Micropaleontological Reference Centers:

Dalhousie University has proposed that the unclaimed (?) micropaleo collection be housed there. Confusion existed with PCOM over whether ODP had another to distribute. IHP has suggested that other institutions be offered the opportunity to apply for the curatorship, especially since Dalhousie is close to the Lamont collection.

PCOM Consensus:

IHP should provide more information on the requirements and recommendations for an additional ODP micropaleontological reference center.

Other IHP issues:

IHP made additional recommendations outside of publications at its last meeting (e.g. elimination of the TAMU DEC Pro350s. See Appendix D). PCOM agreed that these items should be deferred until the next PCOM meeting as they have budgetary impact for TAMU.

679 CENTRAL PACIFIC PLANNING

R.Larson (CEPAC liaison) opened the discussion as he needed information on planning to bring to the next CEPAC meeting. CEPAC has been given the thematic panel white papers and their rankings of proposals and themes. A major concern to PCOM is that the TECP listed example locations of its thematic interests, not proposals (see Appendix L).

As CEPAC has already begun its prospectus at PCOM's earlier direction, the instructions endorsed in the "interim solution" were reviewed in relation to CEPAC. PCOM agreed that CEPAC should evaluate programs in relation to maturity, adequacy of documentation and probability of success. Each of the thematic panels meet before the next CEPAC meeting and they were charged with providing CEPAC with their six highest priority projects for formulating the prospectus. An 18-month planning framework is still suggested for the CEPAC programs.

Pisias discussed the CEPAC planning in relation to the new mandate for PCOM to provide four years of planning ahead of the drillship. He said that an early sense of the CEPAC drilling will be needed for the PCOM annual meeting in December; a first prospectus from CEPAC will be needed for the spring PCOM meeting.

680 PANEL MEMBERSHIP

PCOM discussed nominations for several panel vacancies which should be filled for upcoming meetings.

LITHP: H.Elderfield (U. Cambridge, U.K. member at large) has been invited and agrees to serve.

Rotating off:J.Sinton (Hawaii)
J.Delaney (U.Wash.)

Nominations:L.Cathles (Cornell)
N.Sleep (Stanford)
J.Karston (U.Wash.)

[Note: Cathles (a hydrothermal processes geologist) has agreed to serve.]

DMP: PCOM previously nominated W.Givens, who declined. M.Salisbury (C) has asked to rotate off and Robinson was asked to follow up with ODP Canada. S.Bell, a Canadian at-large member on DMP, was suggested as Salisbury's replacement.

Rotating off:F.Sayles (WHOI)

Nominations: R.Wilkens (HIG- physical properties)
(from DMP) D.Karig (Cornell - physical properties)
(2 slots open) H.Vinegar (Shell - industry logging)

[Note: PCOM agreed that a physical properties member should be invited, but asked DMP to provide names of pore-water geochemists to replace Sayles. R.Wilkens has agreed to serve.]

TEDCOM: D.Wilson (Chevron) resigned and W.Lowe (Chevron) has accepted membership.

U.von Rad informed PCOM of the German ODP rotations which will be reflected in the October JOIDES Journal. PCOM briefly discussed the balance of membership expertise on PCOM as EXCOM has requested a tabulation of this for the October meeting (Appendix M). Kastner added that the non-U.S. members might take discipline balance into account when panel replacements are made.

681 PANEL CHAIRMANS' MEETING

Pisias asked that PCOM consider a Chairman for the Panel Chairman's meeting scheduled the day before the PCOM Annual Meeting (29 November 1987). D.Cowan (TECP) and L.Mayer (SOHP) were nominated. [Note: D.Cowan has accepted.]

682 DMP RECOMMENDATIONS

Several DMP recommendations were presented at their April 1987 and at the August meeting for PCOM action (See p.25 in PCOM agenda book and DMP Executive Summary from the August meeting).

R.McDuff (DMP Liaison) presented the recommendations from DMP, developed with the Physical Properties Working Group, on

shipboard instruments suggested for FY89. The wireline packer/FMS issue impacts FY88. The item on vertical seismic profiling has been deferred until the VSP workshops results are in. McDuff reported that several of DMP's concerns on "acceptable risk" to the drillstring during logging have been resolved between LDGO and TAMU.

Logging through the pipe:

DMP has asked that, whenever necessary, logging through the pipe with the geochem/neutron combination tool should be routinely carried out. PCOM agreed with DMP that a dedicated experiment for comparison of logs through the pipe with normal ones should be carried out, and endorsed DMP recommendation 1987/4:

PCOM Consensus:

> A more realistic definition of what constitutes an acceptable level of risk to the drillstring should be formulated. This definition should admit an element of risk since the occasional loss of a BHA is sustainable and would be costwise incremental to the cost of the drilling operation itself.

PCOM suggested that DMP provide possible sites and experimental design for a comparison test as LDGO does not have the data for a direct comparison. It was suggested that the physical properties members of DMP work with LDGO in designing such an experiment. Larson suggested the Argo deep hole as a possible test site.

683 FUTURE MEETINGS SCHEDULE

Pisias provided details of the upcoming 30 November- 4 December Annual meeting in Sunriver, near Bend, Oregon (Appendix N). He invited PCOM members to visit the JOIDES Office at Oregon State University if schedules permit. Robinson, who will be at sea then with Leg 118, announced that John Malpas would be his replacement at the meeting.

The next PCOM meeting was scheduled for 20-22 April, 1988, in College Station, TX.

PCOM tentatively blocked out the week of 29 August 1988 for the next meeting, to be hosted by the U.K.; this will be finalized at the Annual meeting.

R.Larson asked that the minutes reflect PCOM's thanks to Asahiko and Iko Taira for their logistics support and field trip planning during this meeting to which PCOM heartily concurred.

There being no further business to consider, the Planning Committee adjourned.

PLANNING COMMITTEE MEETING
Nikko, Japan
26-28 August 1987

Meeting Handouts:

- Appendices for SSP Minutes
- Watchdog Reports: Vanuatu, Nankai, Bonins, Geochemical Reference Sites
- Leg 121 Information (J.Weissel)
- IHP Meeting Executive Summary
- Leg 118 letters (D.von Herzen and P.Robinson)
- SOHP Comments on ODP Advisory Structure
- Sunriver Information Sheet and Brochures
- DMP Meeting Recommendations
- Overheads from JOI Report
- JOI ODP Brochure (T.Pyle
- Site 122 Site Proponents' Memo (from U.von Rad)
- Letter from Pisias on Western Pacific Planning to WPAC and Thematic Panel Chairmen
- Tentative 1st Six-leg Western Pacific Program
- 6000 Deep: A Trip to the Japanese Trenches [Photographic records of KAIKO project Nautile dives from J.P.Cadet]

APPENDIX A

NSF written report (compliments of Dick Buffler):

1. *NSF sends its regrets that a representative is unable to attend due to panels, changing of the guard, etc.*

2. *Bruce Malfait will replace Dick Buffler as ODP Program Director at NSF effective September 1. Buffler will be returning to the University of Texas. Malfait will temporarily remain as acting Program Director of MGG. NSF will now advertise for the position of MGG Program Director.*

3. *THERE IS NOTHING NEW TO REPORT ON the FY 88 budget. It is still working its way through Congress.*

4. *NSF/ODP is committed to the following Pacific regional surveys:*

   A. *Seismic stratigraphy of the Hawaiian flexural moat (Detrick and Watts).*

   B. *Geophysical surveys, Interaction between Chile Ridge and Chile Trench (Cande).*

   C. *Regional study: the origin of the Hawaiian hotspot trail (NW Pacific) (Lonsdale).*

   D. *Sediment coring, Detroit Seamount, NW Pacific (Keigwin).*

   E. *Carbonate bank development and vertical tectonic history, Marshall Islands, W. Pacific (Schlanger and Duennebier).*

   F. *Seismic depth transect, Ontong-Java Plateau to Naru Basin (Winterer).*

It is anticipated that several more surveys will be funded following the August MGG panel.

Table E-1. FY88 BUDGET RECAPITULATION FOR TAMU

	Budget Outline (subcontractor's draft response to PCOM Plan)	$31,100,000
	Engineering Development Addition due to minor budget adjustment	+ 12,277
	Drilling Operations Addition for drilling supplies (revised amount due to reassessment of loss/use to date).	+ 103,504
*	Technical Support Eliminate 6 marine techs; eliminate some shorebased support by having some MTs work only at sea; eliminate XRF/XRD & SEM labs; the DSDP Manual XRD Unit (Rigaku) will be installed on the ship for operation by scientists; add graduate students for shipboard support.	- 235,863
	Logistics Support Reduction due to minor budget adjustment.	- 4,160
*	Science Operations Eliminate 3 staff scientist positions, and the research engineer; reduce JOIDES liaison travel.	- 180,268
*	Publications Produce Part B in camera-ready form thereby eliminating 7 positions and creating 2 new ones; limit the number of Proceedings volumes and microfiche remainder, use uncoated paper stock.	- 225,607
*	Computer Services Eliminate new software acquisitions and two programmer positions; curtail some maintenance.	- 216,240
*	Data Bases Eliminate one position; some slow down of archiving services.	- 50,253
*	Curation Eliminate two positions; some slow down of servicing sample requests.	- 67,000
*	Headquarters Budget reductions due to lessening of reporting requirements. $60 K has been transferred to logistics for graduate student support.	- 128,390
	Ship Operations Additional funds for ice boat and dayrate increase.	+ 1,100,000
	PROGRAM PLAN BUDGET	**$ 31,208,000**

Table E-2 FY88 BUDGET SUMMARY ($M)

	FY87	FY88
TAMU		
Eng. Development	1.123	1.182
Drilling Operations	2.106	2.258
Tech. Support	2.400	2.257
Logistics Support	0.668	0.676
Science Operations	0.938	0.769
Publications	1.315	1.554
Computer Sciences	0.901	0.745
Data Bases	0.207	0.159
Curation	0.788	0.690
HQ/Admin.	1.703	1.672
Ship Operations	17.951	19.246
	30.100	31.208
LDGO	2.750	2.782
JOI/JOIDES	1.430	1.540
	$34.280	$35.530

Table E-3 FTE Comparisons FY87-FY88

	FY87	FY88
TAMU		
Administration	32.0	32.0
Science Services	50.0	42.0
Engineering and Drilling	16.0	15.0
Technical and Logistics Support	40.0	34.0
Science Operator	16.5	12.5
Total	154.5	135.5
L-DGO		
Wireline Logging Services	9.0	9.25
Stanford University	1.2	1.25
JOI		
Direct	6.3	6.1
Indirect	5.5	5.3

Information Handling Panel Meeting,
3-6 August 1987
Lamont-Doherty Geological Observatory

Executive Summary

The main focus of this meeting of the IHP was to evaluate the impact of budget reductions on the Science Services Department operations at TAMU,and to determine how these reductions might be best effected. In doing this we have been guided by two sets of principles. First, the EXCOM and PCOM have indicated that these reductions should be made in such a way as to reduce production costs of the ODP volumes by shifting some of the associated expenses more toward the science. Second we wished to adhere to a set of established priorities for maintaining the quality and prestige of the ODP publications (IHP Minutes of their 6-8 June 1984) as well as for developing and preserving ODP data bases.

Several models for revision of the publication process were presented to the IHP by ODP/TAMU and by one publication office of a scientific society. In the end we rejected all of these models, but retained some of their specific ideas. In addition we took into account the stated desires expressed by members of the international scientific community to members of the IHP.

Recommendations concerning the publications

1. We recommend against having part B of ODP volumes published by the publications office of a scientific society. This recommendation is made because a) such a move would significantly delay the onset of publication of the part B series; b) it would reduce the cost effectiveness and integrity of the ODP publication process; and c) it would transfer a substantial cost of the volumes to the end users. We are also concerned about uncertainties in contracting for this service - uncertainties such as copywrite ownership, quality and size of the publications, control over long-term cost increases, continuity of the series, and legal difficulties with the contracting process.

2. We recommend that we maintain two ODP volumes (parts A and B) as originally planned. This will clearly separate the basic data presentations (unreviewed) in part A and the peer-reviewed papers (plus a possibility of some additional data papers) in part B. We feel that the only way to achieve the stated goals of budget reduction and to adhere to the established priorities of publication quality is to shift some of the costs of manuscript production to the authors and to reduce the production costs of the volumes themselves, particularly part A. We accepted the budget reductions recommended by EXCOM and PCOM for the Science Services Department at TAMU. These reductions removed type setting and editorial and artwork assistance from the ODP budget. We then searched for ways to reapportion the remaining monies to achieve the highest quality product in both publications and data base development (Table 1). The recommended additions to the budget (offset by additional savings) are aimed at a)assuring a well edited, quality publication of scientific results and b)enhancing the development and accessibility of the ODP data bases.

Table 1

Additional Savings	$ x 1000	Extra Expenses	$ x 1000
Reduce part A from 1000 to 800 pp.	70.0	Type setting (part B)	60.0
Reduce "Other Publications" costs.	4.3	Editors (2)	66.0
Reduce number of volumes printed to 1600 (each) printed on uncoated paper except for paleo. plates	25.0	Data base assistant	35.0
Sell offprints at costs	9.0	Contract programmers	20.3
Delete color frontice piece (parts A+B)	30.0		182.3
Reduce scope of Indices	20.0		
Allow only one backpocket insert	24.0		
	182.3		

3. We recommend that the review process for part B manuscripts be directed by an editorial board. For each leg, this board would consist of the two co-chief scientists, the ODP staff scientist, an ODP editor and one other scientist to be selected by the TAMU science manager in consultation with the co-chief scientists. This board will be responsible for the peer review process in obtaining adequate reviews and in making decisions concerning the acceptance or rejection of papers. Members of this board should be listed on the fronticepiece of each volume.

4. We recommend that English be retained as the required language for all manuscripts.

5. We recommend that all volumes be hard bound.

6. We recommend that all volumes be microfilmed.

7. We recommend that authors be responsible for providing 'camera-ready' illustrations for their papers.

8. We recommend that ODP strongly encourage all authors to provide manuscript copy in a form that is electronically capturable. This form consists of a wide range of typewriter-style fonts. ODP/TAMU will be responsible for establishing and publicizing these preferred formats. ODP should be authorized to establish a schedule of charges for those authors who do not provide their copy in one of the preferred formats.

9. We recommend that ODP/TAMU immediately inform shipboard participants of the status of the part B volumes now in production and of changes in publication policy and format.

10. We recommend that, once these suggested changes in the publication process have been approved and put into effect, the publication office at ODP be allowed to experience an extended interval of relative budgetary stability.

11. We recommend that ODP/TAMU report annually to IHP on the status of their budget for the past year and their budgetary plans for the next year.

Recommendations concerning data acquisition and data base development

12. We recommend that the first priority of the computer services group should be efficient data base capture in machine readable form.

13. We recommend that the second priority of the computer services and data base groups (jointly) should be data base development (including bringing on line the DSDP data base).

14. We recommend that monies saved in publication costs (in excess of that required to hire two editors) be applied to the two top priorities noted above (Table 1).

15. We recommend that ODP/TAMU rapidly eliminate the use of DEC PRO350's. In particular, we recommend that the ODP/TAMU word processor be upgraded to an IBM-compatible system in order to promote increased compatibility with systems most widely used in the international community.

16. We recommend that computer and programming support to people outside the Science Services Division be strongly curtailed.

17. We agree that the USSAC plan to put the DSDP data base on a CD-ROM is a good idea.

Recommendations concerning the paleontologic reference centers.

18. We recommend that a decision on where to locate an eighth paleontologic reference center be delayed until other countries and institutions have had an opportunity to apply.

19. Noting that now the paleontologic reference centers are being successfully and productively used, even with incomplete collections, we recommend that the work of sample preparation be completed. We further recommend that funds be provided for this purpose by JOI at a level of about $60,000 per year for two years.

MEMORANDUM

FROM: Leg 122 Site proponents
Ulrich von Rad, Hannover (FRG)
Ron Boyd, Halifax (Canada)
Neville Exon, Canberra (Australia)

TO: PCom, SOHP, IOP, ODP (TAMU)

Objectives, priorities and new drilling time estimates for ODP Leg 122 Sites (Exmouth Plateau)

See revised ODP proposal 121B by v.Rad, Exon, Williamson and Boyd (May 1986) and new proposal by J. Mutter & R. Larson on EP12 (July 1987) for detailed objectives, location maps, track charts, seismic sections, line drawings, isopach maps etc. For the predicted stratigraphy and lithology of all sites see Figs. 1 and 2.

1. Objectives and priorites

In its April 1987 meeting PCom has decided to drill the following, Exmouth Plateau Sites during Leg 122 (July-September, 1988): EP-2A, EP-6, EP-7, EP-10A. In its March 1987 meeting, SOHP has set up the following order of priorities: EP-7, EP-10A, EP-2A, EP-6. After checking the interval velocities and correlating with nearby commercial wells, we found out that the total depths to the drilling targets for EP6, 7, and 10A are about 20-30% higher than estimated in the original proposal. This increased the drilling time estimates. Therefore it is possible that only one of the upper plateau sites (EP6 or 7) can be drilled. Note that Site EP-2A has been replaced by the better positioned Site EP-12 on the western margin of Exmouth Plateau, proposed by J. Mutter & R. Larson. Since EP9 and AAP1B which are part of the same Exmouth-Argo transect (Fig. 2) will be drilled during Leg 123, both legs should be considered as one major scientific venture with much interaction during the planning stage, pre- and post- cruise conferences, and publication of results.

EP-7 (Fig. 1) is the primary site on the top of the Exmouth Plateau which will provide an almost complete, condensed Early Cretaceous to Neogene section, especially a test of the Cretaceous global sea level curve in the classic type-section of the upper, middle and lower Barrow delta (derived from the south) and overlying mid-to late Cretaceous strata. EP7 is also important for the differential subsidence history between plateau and outer margin (paleodepth transect). Tectonically, the substructure of this site is characterized by thin-skinned extension and very slow subsidence. The high-resolution down-hole seismic logging tool should be used at that site.

EP-12 (Fig.1) is the alternate site for EP2A (Fig. 1) proposed by J. Mutter & R. Larson in July 1987. It will penetrate the most seaward, large, rotated fault-block on the western margin of the Exmouth Plateau at a water depth of 2025 m. Main objectives: evolution from an Early Cretaceous syn-rift to a Late Cretaceous to Tertiary post-breakup facies and the timing, duration and amount of subsidence and deformation of the outer plateau margin close to the ocean/-continent boundary (but overlying unambiguous, deformed continental crust). EP2A at the foot of the western escarpment of the Exmouth Plateau is a back-up site for EP12.

APPENDIX E

EP10A (Fig. 2) provides the best opportunity to sample the Triassic to Jurassic (to earliest Cretaceous) pre-and synrift (as well as early post-breakup) sediments on Wombat Plateau, a subplateau of the northern Exmouth Plateau that experienced breakup already in mid-to late Jurassic times. The nearby companion Site EP9E, to be drilled during Leg 123, will continue this section upwards from the Early Cretaceous to the Neogene. EP10A and EP9E are important shallow-water comparison sites to the deep-water Argo Abyssal Plain Site AAP1B: paleodepth transect, Tethys-type circulation, and subsidence history. EP11 or EP8 are back-up sites for EP10A.

EP6 (Fig. 1) is a companion site to Site EP7. It is located on the southeastern Exmouth Plateau in the Kangaroo Syncline close to the slope to the NW Shelf. The detailed correlation of sedimentatio events and hiatuses between Site EP6, 7 and 12 will allow the differen tiation of global sea level events from local or regional tectonic or sedimentological (delta input) events. In EP6 it will probably only be possible to penetrate to the Gearle Siltstone (Albian-Turonian, 1000 m), if enough time is left. Otherwise EP-6 is an alternate Site for EP7.

2. Drilling Time estimates

We estimate the following drilling times, including about 1 to 2 days of logging per site. The estimates are tentative, but conservative and partly based on estimates provided by ODP. The listing shows our suggested order of priorities. For EP6 we list 2 alternatives: (a) drill to 1000 m bsf (single-bit) and (b) to 1400 m bsf (reentry). Total drilling time for Sites EP7 (or EP6) + EP12 + EP10A will be 45-46 days. Because of its more complete section and penetration down to the Jurassic Dingo Claystone, EP7 has a much higher priority than EP6. Also we would rate the early Mesozoic (Tethys) objectives of EP10A and the outer margin (synrift half-grabe fill) objectives of EP12 higher than those of a second site on the top of the Plateau (EP6).

Site	Lat.(S)	Long.(E)	W.D.(m)	Penetr. (mbsf)	S=single-bit R=reentry	days (incl. loggir (max ↓ min ↓)
1.EP- 7	20°36'	112°07'	1365	1350	R	16 (12
2.EP-12	19°19'	112°08'	2025	1000	S	10
3.EP-10A	16°56.6'	115°33.1'	2050	1250	R	19 (11
4.EP- 6	21°17.8'	113°28.5'	1250	a)1000	S	9
EP- 6				b)1400	R	17 (13

Total drilling time with EP7 or 6, 12 and 10A (min. 33)* *45-46 day
Total drilling time with EP7, EP12, EP10A and EP6 (to 1000 m) (min. 42) 54 day
Transit time (Fremantle-Djakarta) + Site-Site travel about 8-10 day

P.S. Port Hedland would be a much closer port between Legs 122 and 123 th Djarkarta or Darwin!

Ulrich v. Rad

Hannover, 18 August 1987

*min. drilling time estimates by Lou Garrison Aug. 26, (preliminary!): EP7+12+10A = 33 days
EP7+12+10A+6 = 46 days

CO-CHIEF RECOMMENDATIONS

EXMOUTH PLATEAU (Leg 122):

F.Gradstein (C)
B.Haq (US)
D.Hayes (US)
K.Hinz (FRG)
R.Larson (US)
J.Mutter (US)
von Rad, U. (FRG)
D.Sawyer (Texas)
Sibuet, J.C. (F)
Whitmarsh, R. (UK)

ARGO ABYSSAL PLAIN: (Leg 123):

R.Buffler (Texas)
F.Frey (US)
F.Gradstein (C)
J.Honnorez (F?)
C.Langmuir (US)
J.Ludden (C)
J.Natland US)

[Note: List includes panel recommendations plus names forwarded at this meeting.]

JOIDES Planning Office

College of Oceanography
Oregon State University
Corvallis, OR 97331
Telephone: 503-754-2600

2 September 1987

To: Bob Detrick, LITHP Chairman
Larry Mayer, SOHP Chairman
Darrel Cowan, TECP Chairman
Brian Taylor, WPAC Chairman
From: Nick Pisias, PCOM Chairman
Subject: PCOM Evaluation of the Third WPAC Prospectus

At the last PCOM meeting the Third WPAC Prospectus was evaluated. This memo is to inform you of the results of our meeting and request you panel to provide specific information which will be needed for the annual PCOM meeting this November. At this meeting PCOM will finalize the program plan for FY89 (the first six legs of drilling in the Pacific). We must also consider programs beyond FY89 which require engineering development and other expenditures in next years program. The results of the PCOM discussion, by program, are:

1. Banda-Sulu-SCS Basin

   PCOM feels that this program does not warrant more than one leg of drilling. PCOM feels that one leg would provide first order information on thematic problems related to the ages of these basins. PCOM requests WPAC to prepare a single leg program for this transect. PCOM suggests that the program should consist of one South China Sea Basin site, one Sulu and one Banda Sea site (with the latter sites being located on oceanic crust). For PCOM to consider more than one leg for this transect, WPAC must provide a well defined justification for drilling beyond one leg. A Celebes Sea site might be considered as part of this one leg program.

2. Sunda

   Because of the low ranking by the thematic panels and the uncertainties about whether this leg can address collisional processes, PCOM cannot consider this leg for the FY89 program. However, if the planned site survey data and the proponents provide the TECP with justification that drilling in the Sunda region can adequately address collision processes, PCOM is willing to consider this leg for drilling beyond FY89.

3. SCS Margin

   The South China Sea Margin continues not to e included in the WPAC drilling schedule. However, PCOM recognizes that new geophysical survey data available for this region, may result in a change in the

4. Bonins

The Bonin I program (Site BON 1, 2, 5a, 5b and 6) is considered by PCOM to be worthy of one and a half legs of drilling. TECP and LITHP are requested to provide scientific objectives which can be addressed with an additional half leg of drilling and their scientific justification. Specifically, PCOM requests scientific justification for drilling diapirs and/or the forearc terrace in the Bonins.

5. Geochemical Reference Hole(s)

PCOM requests that LITHP provide the minimum strategy necessary for obtaining a reference hole(s) for the Bonin system. PCOM feels that the Bonins are the most appropriate place for drilling a geochemical reference hole(s). However, justification of drilling strategies are needed from LITHP.

6. Nankai (incl. Geotech/Zenisu)

PCOM passed the following motion (just shows when things get tough...):

Motion:

a) PCOM approves the Nankai Trough leg (NKT-1 and NKT-2) as presented in the WPAC Third Prospectus;

b) PCOM would consider at a later date (beyond FY89) a second leg which could include extensive geotechnical studies, downhole measurements and Zenisu Ridge drilling.

[Passed: 14 for, 1 against, 1 abstain]

The thematic panels, especially SOHP and TECP, should examine proposed sites along the Nankai transect (NKT-3, NKT-7) for possible development of a program to examine hydrologic processes in this accretionary prism.

PCOM recognizes that the Zenisu Ridge is part of the tectonic setting of the Nankai region.

7. Japan Sea

PCOM accepts the one and a half leg program presented in the WPAC Third Prospectus.

8. Northeast Australian Margin (formerly the Great Barrier Reef; God save us from Greenpeace)

PCOM requests that SOHP provide PCOM with the specific objectives and their justification of this program, which holes address these objectives and how these holes provide the necessary data to achieve these objectives. Specific concerns expressed during the discussions include how the effects of subsidence and sea level changes are going to be identified/separated. PCOM also found that some of the objectives listed in the WPAC Third Prospectus to be unclear and requests that the SOHP provide clarification.

LITHP is asked to provide its evaluation of the Mississippi Valley Deposits Proposal (268/D) for PCOM.

9. Vanuatu

PCOM presently considers this program to be a single leg of drilling. PCOM feels that the D'Entrecasteaux Ridge and Aoba Basin sites address an important thematic process and are of highest priority. The sites in the Coriolis Trough and also site BAT-2 are considered to be of lower priority. WPAC is asked to provide PCOM with a single leg program for this region.

10. Lau Basin

At the present time, PCOM considers the Lau Basin to be an important region to examine backarc processes, specifically to examine volcanism and its relationship to the tectonics of the backarc. Drilling in the Lau region should focus on backarc processes. LITHP is asked to formulate two scenarios for a single leg of drilling; on a leg without drilling on bare rock and one leg drilling on bare rock zero age crust. Specifically, LITHP should provide the scientific objectives for each of these scenarios and describe the relative merits of each. We wish to endorse the LITHP's recommendation that this program should be focused, and thus consider drilling the forearc not of prime importance.

TECP is asked to provide LITHP and PCOM with their views on the tectonic objectives to be addressed in the Lau backarc.

WestPac legs after PCOM dissection:

Leg 1:Banda-Sulu-SCS Basin:
BNDA1, SUL5, SCS5, SCS9

Leg 2: BONIN-I
BON1, BON2, BON5A+B,

Leg 3: BONIN-II
BON6, +diapir/or forearc terrace

Leg 4: Nankai:
NKT1, NKT2

Leg 5: Japan Sea-I
J-1b, J-1d, J-1e, J-3a

Leg 6: Japan Sea-II
J-2a, JS-2

(Nankai Geotech/Zenisu)

(Bonin Reference)

(Sunda ?)/CEPAC

Northeast Australian Margin:
One leg program (approximately 8 sites)

Vanuatu:
DEZ1-5 (5 sites), IAB-1a, IAB-2

Lau Basin:
One leg program focussed on backarc objectives.

APPENDIX H

NOT AN OPERATIONAL SCHEDULE
NOT FOR DISTRIBUTION

PLAN FOR WESTERN PACIFIC

LEG	OBJECTIVE	TOTAL DAYS	START	FINISH	END PORT	PORT DATES
121	Broken Ridge and Ninetyeast Ridge	54	1 May '88	24 June	Singapore	June 24-28
122	Exmouth Plateau	53	29 June	21 August	Jakarta	August 21-25
123	Argo Abyssal Plain and Exmouth Plateau	56	26 August	21 October	Jakarta	October 21-25
124	~~Sunda~~ Banda-SCS.B.	54	26 October	19 December	Darwin	December 19-23
125	~~Banda Sea~~ Bonin I	47	24 December	18 February '89	Manila	18 February 1989
126	~~Sulu/Sea~~ Bonin II	48	23 February	20 April	Manila	April 20-24
	~~Bonin~~ I Nankai	50	25 April	20 June 28 May	Tokyo	May 28 - 1 June
128	~~Nankai~~ Japan Sea	58	25 June	30 August ~~July~~	Yokohama	July 30 - 3 August
129	Japan Sea II	46	2 4 August	19 ~~September~~ October	Niigata	September 19-22 10 — 22 Oct.
130	Japan Sea II	30	24 September	24 October	Nagasaki	DRY DOCK 24 Oct - 6 Nov
131	Bonin II	48	7 November	28 December	Guam	December 28- 1 Jan 1990
132	CEPAC: OJP?	56	2 January	27 February	Port Moresby	27 February- 3 March
133	NEA	56	4 March	29 April	Noumea	29 April - 3 May
134	Vanuatu I	56	4 May	29 June	Noumea	29 June - 3 July
135	Vanuatu II	41	4 July	14 Aug	Suva	August 14-18
136	Lau-Tonga	59	19 August	17 October	Pago-Pago	October 17-21

August 17, 1987

FORMALIZED PROPOSAL PROCESS
Suggested Outline

Issues to consider:

- thematically derived program
- review of proposals with adequate feedback to proponents

I. PROPOSALS ONLY SENT TO THEMATIC PANELS

IF panels accept proposal as having merit in terms of thematic issues

THEN proposals evaluated

IF proposal found to have merit
THEN proposals GO TO regional panels

ELSE [otherwise] deficiencies summarized and proposal returned to proponent

ELSE [otherwise] proponent informed that proposal does not address thematic issues and would need to be framed more in terms of program objectives. It is the responsibility of the proponent to do this.

II. REGIONAL PANELS evaluate proposals in terms of maturity, adequacy of documentation, and probability of success.

IF proposal is acceptable

THEN it is returned to thematic panels and PCOM for further consideration and ranking

ELSE [otherwise] it is returned to the proponent with statement of nature of deficiency; thematic panels encourage proponent to provide supporting data and provide feedback to regional panels as to possible disagreements.

JOIDES Planning Office

College of Oceanography
Oregon State University
Corvallis, OR 97331
Telephone: 503-754-2600

3 September 1987

To: PCOM Members
From: Nick Pisias, PCOM Chairman
Subject: PCOM Subcommittee to Evaluate Panel Structure

I propose the following membership to the PCOM subcommittee to discuss the JOIDES panel structure:

Tim Francis and Asahiko Taira were selected by the non-U.S. members of PCOM. I have asked Marc Langseth and Margaret Leinen (alternate and ultimate replacement for Roger Larson) to serve as the other PCOM representatives. I selected Margaret because she has observed the panel structure as a member of both a regional and a thematic panel, she provides discipline balance to a subcommittee heavily represented by geophysicists and finally, to ensure that the committee is not totally an "insider" group.

Ross Heath has agreed to be on the committee as an EXCOM representative, and can attend meetings on December 1 and 2. I would propose, then, to have this subcommittee meet during the evenings of December 1 and 2, and give an initial report to PCOM on December 4, the last day of our annual meeting.

My suggested instructions to the subcommittee are:

1. Evaluate the present panel structure and make recommendations to PCOM on possible modifications;

2. Any proposed increase in thematic panels should be the minimal increase necessary to adequately represent the global themes addressed by Ocean Drilling;

3. The role of regional expertise should be considered.

4. A final version of the subcommittee report is not be expected until after the COSOD II report is available so that subcommittee recommendations can address some of the thematic problems raised at COSOD II;

5. If possible, a final set of recommendations should be available for discussion at the April meeting so that PCOM's recommendations concerning panel structure can be presented at the spring joint meeting of EXCOM and the ODP Council.

If you have any suggestions or changes to these instructions, please let me know as soon as possible so that I can have a final report for presentation to EXCOM during the first week of October.

SUGGESTED PROPOSAL REVIEW FORM

(To be returned to Proposal File and Proponent)

Number:

Title:

Author(s):

THEMATIC PANEL EVALUATION:
1. [ ] Addresses thematic objectives
2. [ ] Addresses objectives with deficiencies
3. [ ] Not thematic

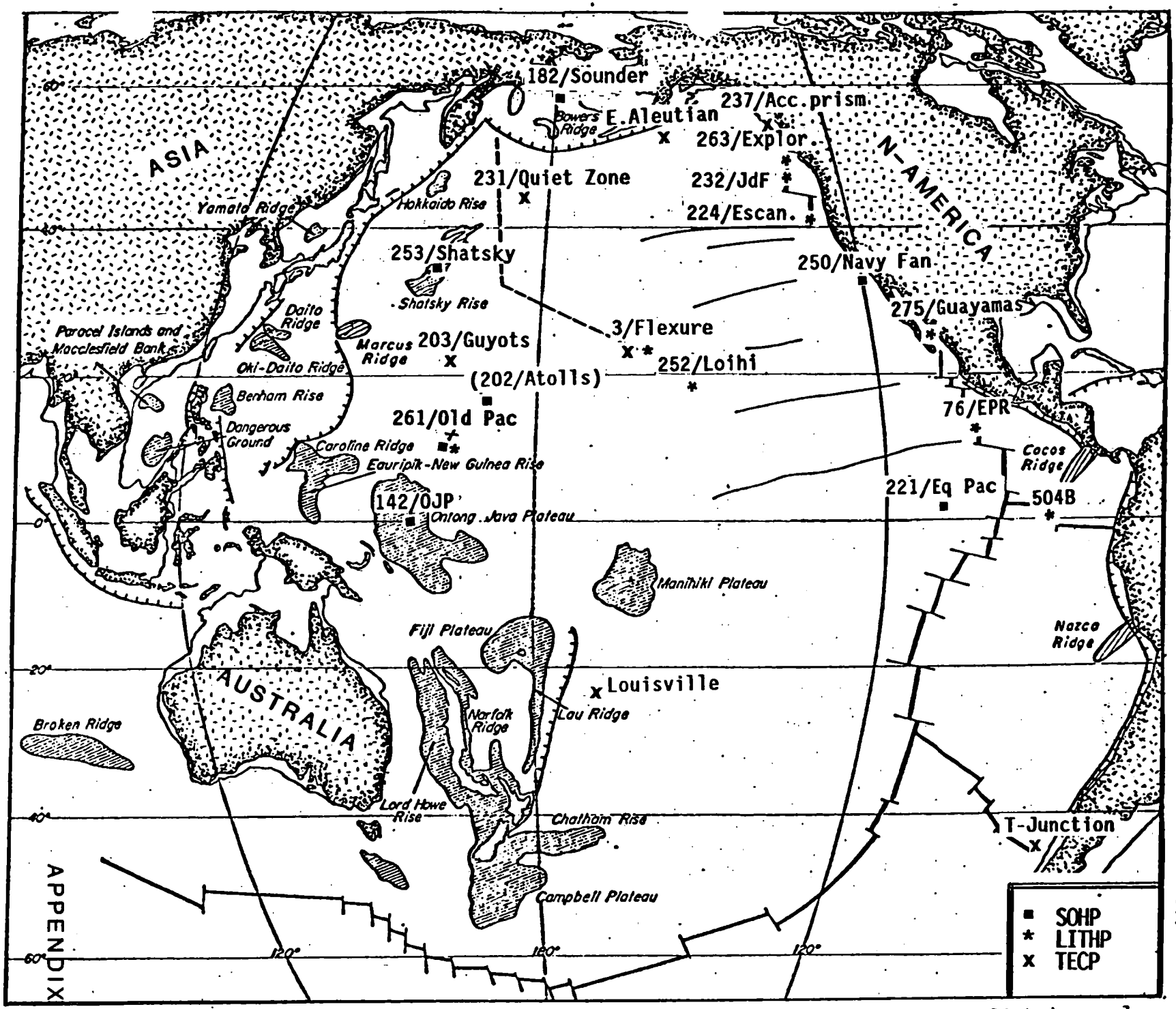
Statement of Reason for 2:

REGIONAL PANEL EVALUATION:
1. [ ] Mature
2. [ ] Deficient

Deficiencies:

Thematic Rank:

APPENDIX K



SOHP:

1) 221/Eq Pac
2) 182/Sounder
3) 261/Old Pac
4) 142/OJP
5) 253/Shatsky
6) 250/Navy Fan
.
.
10) 202/Atolls

LITHP:

1:
232/JdF sedim
252/Loihi
76/EPR
Site 504B

2:
275/Guaymas
3/Hawaii Flex.
224/Escanaba Tr
261/Old Pac

TECP:
(Examples)

231/Cret Quiet Z.
261/Jur Quiet Z.
Louisville Ridge
203/>70 Ma Hotspot
Aleutian (Subduct. rate; arc geochem)
?Chile (Ridge-Trench
237/Accret Prism
3/Lith Flexure

Note: TECP didn't rank proposals but listed examples

APPENDIX L

PCOM Discipline Balance

As requested by EXCOM a listing of PCOM members and their areas of expertise was compiled and appears below:

G.Brass (U.Miami): geochemistry, paleoceanography
J-P. Cadet (F):
W.Coulbourn (HIG): biosedimentology, foram ecology
O.Eldholm (ESF): marine geophysics, plate tectonics, continental margins
T.Francis (U.K.): marine geophysics
S.Gartner (TAMU): micropaleontology, biostratigraphy, paleoceanography
M.Kastner (SIO): geochemistry
M.Langseth (LDGO): marine geothermal and hydrogeology, marine geophysics
R.Larson (URI): marine geophysics, crustal evolution, plate tectonic reconstruction
R.McDuff (U.Washington): marine geochemistry, hydrothermal systems
N.Pisias (OSU): paleoceanography, paleoclimatology
P.Robinson (C): igneous petrology
D.Ross (WHOI):
T.Shipley (U.Texas): marine geophysics, convergent margin processes/structure/tectonics
A.Taira (J): active margin sedimentation and tectonics
U.von Rad (FRG): marine geophysics, deep sediments

Rotation Schedule:

D.Cowan (U.Washington, replacing R.McDuff): structural geology, tectonics
M.Leinen (URI, replacing R.Larson): sedimentology, sediment geochemistry, paleoceanography

Discipline Balance:

These are minimal subdivisions. Distribution between purely sedimentologists and paleoceanographers, for example, were not made.

	Present	Anticipated Rotation
Sedimentologist	5	5
Geophysicist	6	6
Geochemist	3	4
Igneous Petrologist	1	1
Structural Geologist	-	1

SUNRIVER

ANNUAL PCOM / PANEL CHAIRMEN'S MEETING

30 November - 4 December, 1987
Sunriver, Oregon

Flight Information:

Portland to Redmond, Oregon (fare $160 rt)
Horizon Air

dep Portland	7:35 am/	arr Redmond	8:15 am
	9:20 am		10:00 am
	12:55 pm		1:35 pm
	2:55 pm		3:35 pm
	4:20 pm		5:00 pm
	8:50 pm		9:35 pm

Return flights dep Redmond	5:45 am/	arr Portland	6:25 am
	7:00 am		7:40 pm
	8:30 am		9:10 am
	10:20 am		11:00 am
	1:50 pm		2:35 pm
	5:25 pm		6:05 pm
	8:00 pm		8:45 pm

Seattle to Redmond, Oregon, via Portland (fare $240 rt)
Horizon Air

dep Seattle	6:30 am/	arr Redmond	8:15 am
	11:30 am		1:35 pm
	7:30 pm		9:35 pm

Return flights dep Redmond	8:30 am/	arr Seattle	10:15 am
	10:20 am		12:15 pm
	5:25 pm		7:15 pm
	8:00 pm		9:50 pm

San Francisco to Redmond, Oregon (fare $420 rt)
PSA

dep San Francisco	8:24 am/	arr Redmond	9:47 am
	4:15 pm		6:15 pm

Return flights dep Redmond	10:00 am/	arr San Francisco	12:20 pm
	6:35 pm		8:05 pm

*Please note schedule and fares are subject to change. Seating is limited so we would suggest making flight arrangements as soon as possible.

APPENDIX N

JOIDES Lithosphere Panel

Chairman's Annual Report

1987

The Lithosphere Panel (LITHP) has met twice since the last annual PCOM meeting: in May at Lamont, and in October in Paris. The October meeting was held jointly with CEPAC. Both were three day meetings and, in general, I believe the semi-annual meeting schedule begun this year has worked out quite satisfactorily. The 3-day meetings are long enough to discuss important issues in sufficient detail, and meeting only twice a year appears to be frequent enough to provide the input needed by PCOM.

The panel accomplished three main tasks at these meetings: (1) completion of the long-awaited LITHP White Paper, (2) evaluation of the 3rd WPAC Prospectus, and (3) review of CEPAC proposals and development of LITHP thematic objectives in the CEPAC area. Our recommendations in each of these areas are briefly summarized below. I also include some comments on the panel advisory structure and long-term planning within ODP.

LITHP White Paper

In May, the LITHP White Paper was completed and distributed to PCOM and the regional and thematic panel chairmen. The purpose of this document was to identify important global lithospheric drilling themes, and develop specific recommendations on the drilling strategies and technical development required to achieve these objectives.

The panel identified the two most important long-term lithospheric drilling objectives as: (1) the completion of one or more deep holes into the lower oceanic crust, and (2) the establishment of a suite of crustal drill holes at both fast and slow spreading ridges. We recognized that achieving these long-term drilling objectives will require a major engineering development effort to improve crustal drilling technology, and strongly recommended that a major commitment of manpower and resources be devoted to this effort within ODP over the next 5-7 years. In the short-term, the panel identified a number of important lithospheric problems that can be addressed using existing drilling technology in intraoceanic convergent margins, on old oceanic crust, in young oceanic rifts and on oceanic plateaus and aseismic ridges. We argued that the most sensible lithospheric drilling strategy for the next five years was to continue to address these problems, with a parallel engineering development effort to obtain the drilling technology needed to achieve our longer-term lithospheric objectives.

I have heard some comments that the recommendations to come out of COSOD II, especially the Crust-Mantle Interactions Working Group, are at odds with the priorities established by LITHP, and that our panel has not been representing the views of the broader community. This impression is not correct. LITHP has always rated deep crustal drilling as one of its highest priority thematic objectives and on this count we are in full agreement with the Crust-Mantle Interactions Working Group. They did not rank ridge crest drilling as highly as LITHP, but I believe that is because LITHP represents a much broader constituency, including the hydrothermal community, who were included in a separate COSOD II working group. The problem in the lithosphere community is not on agreeing what we want to do, it is in having the drilling technology and the drilling time to achieve those objectives.

Evaluation of 3rd WPAC Prospectus

At our May meeting, we gave an overall appraisal of the 3rd WPAC Prospectus. The Bonin drilling program, the Japan Sea legs and the Lau Basin drilling all satisfy important thematic interests in the western Pacific and were all rated highly by our panel. In the case of the Lau Basin, we recommended the drilling concentrate on the magmatic evolution of the back-arc basin, especially the interplay between volcanism and tectonics in the early opening of the basin. Bare-rock drilling is not required to achieve these objectives.

The most serious omission in this prospectus, we felt, was the absence of a viable reference hole program which has been one of LITHP's highest thematic priorities in the region. Drilling a series of crustal holes outboard of the arcs in the western Pacific can address a variety of objectives emphasized in the LITHP White Paper. These objectives include: (1) determining the composition of sediment and igneous crust being circulated into the mantle at subduction zones, (2) testing whether there is a correlation between the composition of the subducting plate and the neighboring arc volcanics, (3) investigating the temporal and spatial variations in the composition of igneous crust, (4) determining the alteration history of oceanic crust, and (5) "ground-truthing" geophysical models of oceanic crust produced at a fast spreading ridge. While the term "geochemical reference holes" (and the awful cow-grass-milk analogy) connotes objectives (1) and (2), the priority LITHP places on these holes is based on the entire suite of objectives. We believe a minimum drilling strategy for a reference hole program in the western Pacific is one deep hole outboard of the Bonins and three shallower holes near the Leg 59/60 Mariana transect. This program requires 1 1/2 legs of drilling.

CEPAC Proposal Review and LITHP thematic objectives

During our past two meetings we have reviewed twenty-six CEPAC proposals and ranked them based on their thematic interest, maturity and suitability as part of a Pacific drilling program. Our panel's six highest thematic objectives, and the highest rated related CEPAC proposals are:

LITHP CEPAC Drilling Themes

Ranking	Theme	
1.	**Structure of the lower oceanic crust**	
	Return to 504B (286E)	(1-1 1/2 legs)
2.	**Magmatic and hydrothermal processes at sediment-free ridge crests**	
	East Pacific Rise (76E Revised)	(3 legs)
3.	**Magmatic and hydrothermal processes at sedimented ridge crests**	
	Juan de Fuca Ridge (232E)	(1-2 legs)
	Escanaba Trough (224E,284E)	
	Guayamas Basin (275E)	
4.	**Early magmatic evolution of hot spot volcanos**	
	Loihi (282E)	(1 leg)
	Marquesas (291E)	
5.	**Crustal structure and magmatic evolution of oceanic plateaus**	
	Ontong-Java Plateau (222E revised)	(1 leg)
6.	**Composition and magnetization of old crust**	
	Jurassic Quiet Zone (285E)	(1 leg)

Two important points regarding these recommendations should be emphasized. The top four LITHP drilling themes in CEPAC require bare-rock drilling (EPR, Loihi), young crustal drilling (EPR, Juan de Fuca, Loihi) or high-temperature drilling (504B, EPR, Juan de Fuca, Loihi), none of which are technically feasible at the present time. If the highest priority lithospheric drilling objectives in CEPAC are going to be addressed in this next round of drilling, a major improvement in crustal drilling technology must be achieved over the next 3-5 years. This will require appropriate long-term planning by PCOM and a major commitment of manpower and resources by ODP/TAMU.

In addition to the development of new drilling technology, achieving the highest priority LITHP drilling objectives in the CEPAC area will also require the commitment of substantial amounts of drilling time. A realistic estimate of the drilling time required to address all six LITHP CEPAC drilling objectives is 8-10 1/2 drilling legs; just the top four drilling themes, which we consider a minimal lithospheric drilling program in CEPAC, will require 6-8 1/2 legs of drilling. We believe devoting this amount of drilling time to LITHP objectives in CEPAC is justified because these are, and have been, our panel's highest global thematic priorities. Only 3 legs (106, 109 and 111) will be devoted to these objectives in the first 5 years of ODP.

Related recommendations:

In order to help achieve LITHP drilling objectives in CEPAC we have made the following related recommendations:

1) A minimum of four hard rock guidebases are required for LITHP drilling in CEPAC. Additional guidebases will be required if any near-axis seamount drilling is carried out.

2) An engineering test leg should be scheduled for sometime in the next 12-18 months to allow ODP engineers to field test their new hard rock drilling and coring systems prior to EPR or Loihi drilling.

3) It is desirable to attempt one leg of young crustal drilling as early as possible in the CEPAC program to allow ODP engineers to evaluate their new systems and have time to made necessary modifications.

4) A working group be established to develop a detailed drilling plan for EPR and Juan de Fuca Ridge/Escanaba Trough including strategies for hydrothermal fluid sampling, borehole logging and downhole geophysical experiments (including VSPs, crosshole seismic tomography etc.), as well as options for long-term instrumentation of the drillholes.

<u>Panel advisory structure and long-term planning in ODP</u>

The LITHP has long been a vocal advocate of a more thematically driven drilling program that concentrates on few important global drilling objectives. We believe the circumnavigation philosophy that has driven ODP planning up until now has led to a regionalization of drilling priorities that has been a major impediment to achieving many of the long-term, global drilling objectives recommended at COSOD I and COSOD II. We are thus encouraged that PCOM is finally taking some positive steps toward dealing with this problem, and we hope that some fundamental changes in the panel advisory structure and long-term planning within ODP can be implemented within the coming year. Our panel has discussed how we would like to see the planning process carried out on several occasions. What follows is a summary of some of the ideas that surfaced in those discussions, plus my own personal opinions.

Several factors have contributed to the present situation. One problem, until very recently, has been the largely advisory role of thematic panels and their minimal involvement in the proposal review process or the preparation of drilling prospectuses. We would favor a more hierarchical panel structure in which proposal review and prioritization is done primarily by the thematic panels, with the regional panels evaluating specific drilling strategies and site locations. In this sense we support the recent changes in panel mandates approved by PCOM. However, this should be viewed as only an interim solution. I would argue that in a truly thematically oriented drilling program regional panels should be eliminated altogether. They should be replaced by panels or working groups organized around specific thematic drilling objectives - eg. Neogene paleoceanography or mantle geochemical mapping. These panels would report to the appropriate thematic panel and would be responsible for tackling specific questions such as where to drill, what drilling strategies need to be employed and what drilling technology is required. They might hold workshops to solicit input from the broader

community. They would be responsible for putting together a long-term (~5 yr) drilling plan that addresses their thematic objective. This plan could be based on unsolicited proposals submitted by the drilling community for individual legs, workshop recommendations or the panel's own deliberations. This plan would then be evaluated by the parent thematic panel, and these panels would work with PCOM to incorporate it into an overall global drilling program.

This change in the panel advisory structure would, I believe, help redirect ODP toward a more thematic approach to drilling problems. However, this change alone will not be enough unless there is a parallel change in the way long-term planning is carried out at the PCOM level. Long-term planning in the first five years of ODP has been based on a circumnavigation philosophy with an arbitrarily assigned, equal number of legs in each major ocean basin with no consideration to global thematic objectives, where they are best attacked, or how long it will take to achieve them. The result has been a program with a decidedly regional focus, with the regional and thematic panels fighting over the limited number of legs arbitrarily assigned to a particular area. As long as the long-term planning by PCOM is carried out in this fashion, no amount of fiddling with the panel structure, mandates, liaisons etc. is going to change the regional focus of the program. **Long-term <u>global</u> drilling objectives require long-term <u>global</u> planning, and that cannot be effectively done with the present leg-by-leg, regional planning process.**

We on LITHP would favor a fundamental change in the way long-term planning is carried out in the second five years of ODP (ie. after the conclusion of the planned WPAC and CEPAC drilling programs). As a first step, the plans for a second circumnavigation should be dropped altogether. Each of the thematic panels should be assigned the task of assembling a five year drilling program comprised of say 12 legs that would address the major global thematic objectives outlined in the COSOD I and II documents. In each case they would identify prioritized thematic drilling objectives, where in a regional sense the drilling should be carried out, and the amount of drilling time required. Each "thematic prospectus" would be reviewed by PCOM and used to construct a tentative five year drilling strategy outlining approximately where the ship will go and how much time it will spend in each area. For example, it may be decided to devote most of the first two years to paleoceanographic and tectonic thematic objectives in the Atlantic and Pacific with an engineering leg to test new crustal drilling technology. However, the entire third year might be devoted to drilling a deep crustal hole on old crust in the North Atlantic or western Pacific. That kind of drilling scenario would be impossible with the present planning structure, but might be feasible with this new approach. Once an overall five year drilling strategy has been established by PCOM, the thematic panels and their associated working groups would be charged with developing detailed drilling plans as described above.

Clearly, this kind of approach will not eliminate the problems that will inevitably arise when a variety of groups with competing interests are using a scarce and valuable resource like the drillship. However, I believe it could succeed in giving us the more thematically driven program that the drilling community wants.

Bob Detrick, LITHP Chairman
October, 1987

90

NORTHWESTERN UNIVERSITY COLLEGE OF ARTS AND SCIENCES

Department of Geological Sciences

Locy Hall
Evanston, Illinois 60201
Telephone (312) 491-3238

87672

October 13, 1987

To: Nick Pisias, PCOM Chairman

From: S.O. Schlanger, CEPAC Chairman

Subject: CEPAC Annual Report to PCOM

A. Activities of CEPAC since the PCOM meeting in Hawaii, January, 1987

1. CEPAC has met twice: at Northwestern University, March 30-31, 1987 and in Paris at the IGP, September 29-October 2, 1987.
2. Efforts at both of these meetings were directed at preparing the First CEPAC Prospectus (Northwestern meeting) and the Second CEPAC Prospectus (Paris meeting). Copies of the Second CEPAC Prospectus are included in the material sent to PCOM members for the November Annual meeting in Oregon. It should be noted that the Second Prospectus includes about 22 Legs of drilling.

B. Issues regarding future planning of ODP

1. PCOM should be aware that the COSOD-II report will in all probability contain recommendations for the use of diverse drilling platforms (e.g., the proposed French light drilling ship for HPC and reentry tasks and the use of chartered platforms for long-term drilling sites such as deep margin holes that might take a year or more to complete). Adoption of the probable COSOD-II recommendations will (besides current problems) create a demand for a new structure, or even parallel planning structures.
2. The recent directives from PCOM on the changed role of regional panels have severely disturbed members of CEPAC in that some of these people now regard their role as "rubber-stamping", "superfluous" and/or "scut-work". My personal opinion, based on discussions with CEPAC members is that the role of regional panels as such needs to be re-examined. Could we use only thematic panels with ad hoc regional experts who would be appointed as advisers as each region approaches on the long-term planning schedule?
3. CEPAC finds that advice on drilling problems that are particularly severe in certain regions are apparently not addressed far enough in advance. I particularly refer to the chert-chalk-limestone recovery problem. As per instructions at the PCOM Hawaii meeting I prepared a report for a possible land test site in France for drilling cherty sequences. I since found out, in passing from a UK colleague, that the British submitted a similar proposal for drilling in cherty sections. We are not getting any formal feedback on these problems. When pressed at the CEPAC Paris meeting Adamson allowed as how the chert problem, to his best knowledge had not yet risen to the top of the technical agenda. Maybe this is not the case but it is CEPAC's perception at this time. I must emphasize that THE SUCCESS OF MUCH OF THE PACIFIC PROGRAM WILL DEPEND ON OUR ABILITY NOT ONLY TO PENETRATE CHERTS BUT TO RECOVER WHOLE CORES.

C. Outlook for the CEPAC program

1. The Second CEPAC Prospectus contains enough well-based science to take up ~22 Legs of drilling and proposals are still coming in. PCOM needs to firmly and decisively address the problem of the "18 month" syndrome, particularly with the EPR program in mind.

2. Site surveys for many of the CEPAC programs are well in hand but the US system of funding is still inadequate for short-term "filler" survey needs that pop up. JOIDES needs to support USSAC in it's request for funds for "site specific surveys".

United States Department of the Interior

GEOLOGICAL SURVEY

OFFICE OF ENERGY AND MARINE GEOLOGY
BRANCH OF ATLANTIC MARINE GEOLOGY
WOODS HOLE, MA 02543

92

October 23, 1987

To: Nick Pisias, PCOM Chairman
From: Mahlon Ball, PPSP Chairman
Subject: Annual Report of PPSP to PCOM

PPSP, in its role of providing independent advice to PCOM and ODP concerning safety and pollution hazards, met 3 times during 1987 and has a fourth meeting scheduled for 6 December in San Francisco. Meetings involved proposed drill sites for Leg 115: Mascarene Plateau; Leg 116: Central Indian Ocean; Leg 117: Oman Margin, Owen Ridge and Indus Fan; Leg 118: Southwest Indian Ridge; Legs 119 and 120: Prydz Bay and the Kerguelen Plateau. The San Francisco Meeting will cover Leg 121: Ninety East and Broken Ridges. Seventy drill sites have been approved, three disapproved and 15 moved or approved to shallower depths to avoid structurally high positions.

The year's activities have been complicated to a degree by difficulties inherent to drilling in remote areas of the Indian and Antarctic Oceans. Added to this were problems of political unrest and warfare as they related to obtaining permission to drill in certain areas of the northern Indian Ocean. A number of alternate sites had to be proposed and reviewed for safety hazards by phone and postal correspondence. Despite perplexities, PPSP has acted to insure avoidance of unreasonable risks in JOI-ODP drilling operations. The realization must remain that there is always some risk and that final responsibility for safety precautions lies with the personnel aboard the Joides Resolution as the drilling operations are performed.

Over the past year, the quality of presentations for safety review has generally improved both with respect to submission of data, adequately in advance of PPSP meetings, and to completeness of data presented. Anything that can be done to facilitate simplicity and flexibility in the funding of site surveys and analysis of data arising from survey efforts will contribute to sustaining this trend of improvement. An important step aiding analysis of survey data would be to encourage all scientists conducting surveys to acquire their geophysical information on a grid of relatively closely spaced dip lines (parallel to the short dimension of the surveyed features) and more widely spaced strike lines, at right angles to dip profiles.

PPSP, with the approval of the PCOM chairman, has agreed to serve in an advisory role to the Division of Polar Programs of the National Science Foundation. In this capacity, PPSP will conduct safety reviews for Foundation programs involving drilling activities in Antarctica.

Mahlon M. Ball

ODP SITE SURVEY PANEL

ANNUAL REPORT OF THE SITE SURVEY PANEL

The SSP has met only once since the January, 1987, ODP Annual Meeting - in Copenhagen in July. Our next meeting is tentatively scheduled for March, 1988, in the U.K.. Hopefully it will overlap by a day with a PPSP meeting.

The SSP continues to be pleased with the quality of the completed site survey work. Although we are still cleaning up some details in the Indian Ocean, the bulk of the problems created by late or non-existent site surveys seems to be behind us. The improvements in site survey quality which we have seen on the Exmouth Plateau are a testament to the value of early reviews prior to the final site survey cruise before drilling. Likewise, in spite of an earlier communication breakdown regarding the NE Australia drilling program, the latest word from the site proponents is that the concerns of the SSP have been met with the just completed surveys.

The first year of planned WPAC drilling does not have any major site survey problems. The entire WPAC program will be reviewed at our March meeting with the Chairman of WPAC in attendance in order to maximize the exchange of information and recommendations.

The CEPAC drilling prospectus has just been issued. SSP watchdogs will be preparing synopsis reports for initial review at the March meeting. By then a fairly clear picture of the major holes in the CEPAC site surveys should have come into focus. Some major US cruises which relate to CEPAC drilling recommendations have already been funded.

The ODP Databank has continued to operate at about the same level of activity in FY 87 as in FY 86. The Databank continues to play a essential role which enables the SSP to function effectively.

Respectfully submitted,

John W. Peirce
SSP Chairman
October 30, 1987

DIT/ISM/N° 87.96 Paris, le 9 octobre 1987

OCEAN DRILLING PROGRAM

Technology and Engineering Development Committee Report

Annual P.COM meeting
by Jean JARRY, Tedcom chairman

I. January 87 PNCHMN Meeting

At the Hawaii meeting, an important effort was done by all the panel chairmen to analyse the science priorities of their panels and to translate them into prior engineering needs. It was a tentative work, impossible to complete in one day, but which gave us some trends. I then asked to everybody to think more about it and to write a short paper which could be discussed during the next may TEDCOM meeting. All panel chairmen were invited to attend or to send at least one representative.

The old idea of a riser workshop was emphasized again, to discuss the reasons of wishing to deploy a riser type system, the mechanics of riser systems and the various options of achieving a riser system.

PCOM agreed to that suggestion and allowed TAMU to organize a three day TEDCOM meeting, the first day being devoted to presentations and discussions on the riser technics ; it was also recommended to all the panels to send delegates.

II. Riser workshop

It took place on April 30th at TAMU. 41 people attended, among which 13 scientists from 9 panels, PCOM, EXCOM, JOI and ODP staff.

After an introduction by Nick Pisias, nine speakers talked successively about theory and hardware, time needed for deployment, cost elements for ship conversion, and several engineering analysis.

All attendees got the report of that meeting during the summer.

III. TEDCOM meeting

On the next day, May 1st, the 4th TEDCOM meeting was focused on the description by each panel delegate of its science priorities and of the consequent engineering needs : improvement of such or such present tool, and design of new tools adapted to a better efficiency in difficult terrains.

Chairmen or representatives of LITHP, SOHP, ARP, SSP, WPAC and DMP attended, while TECP, CEPAC and SOP had directly sent papers summarizing their priorities analysis. All their inputs are reported in the TEDCOM meeting report.

To summarize the main conclusions of that meeting, it can be said that :

1) present tools are to be improved to drill faster and deeper, and to have a greater core recovery rate.

2) new tools, as packers for porewater sampling, pore pressure meters, etc., have to be designed and/or purchased.

3) new technics are to be studied to reach new goals, such as drilling in chert/chalk sequences, etc...

It was also proposed that, in some cases, land drilling tests could be done faster and cheaper than at-sea-tests, specially with a mining-type system adapted to the cherts. Typical land sites do exist on both sides of the British Channel, which are of convenient access.

At last, it has been asked that formal links between TEDCOM and DOSSEC be established, in order to exchange information on continental and marine drilling, coring, and logging techniques.

IV. COSOD 2 conference

In May, a small working group of 4 TEDCOM members met in Dallas, Texas. From the basic elements produced at the riser workshop, they prepared a more elaborated paper to be presented in Strasbourg by Barry Harding and Duke Zinkgraf.

Four categories of methods for drilling in hard and fractured rocks or in high pressure areas, had been described at the riser workshops :

1. 18 1/2" oilfield riser system
2. slim line riser system
3. mining system through drill pipe
4. mud lift system on sea-floor.

These four approaches were evaluated in terms of total cost, operational time and cost per hole, for three typical cases :

. deep stable margin hole
. deep margin hole through subduction zone thrust
. zero-age crust.

96

The first conclusions which were presented in Strasbourg have been the following : (see Annex 1)

. system 1 is extremely expensive (more than twice the present system).

. systems 2, 3, 4 have dayly operating costs slightly higher (10 to 15 %) than the present system.

. system 2 looks the most advantageous, at least in a mid term perspective.

. Whith any system, 90 days at least per hole are necessary.

. For system 2, a total investment of $ 6 millions is needed (see annex 2).

This analysis has been well received by the geologist community gathered in Strasbourg, specially by the enthusiastic crust subcommunity who asked if it could be realistically envisioned to drill through the entire crust into the mantle by the year 2000.

The answer is : probably yes, if we start now, progressing step by step, increasing reasonably on engineering R&D budget, which means nevertheless dramatic choices and decisions at the ODP highest level.

An opportunity exists and is not to be missed. A SEDCO slim line riser is for sale at an extremely low price ($ 300,000 or less). Its purchase before the end of the year would allow to start R&D at a reasonable level in the limits of the ODP 88 budget. However, in 1989, a larger share of the budget would have to be reserved for the engineering R&D.

V. Conclusions

1. 1987 outstanding fact is the closing gap between ODP science and engineering. Everybody is now convinced that priorities have to be set up, and big efforts have been undertaken to prepare the necessary choices.

2. It is now generally accepted that new technology will be only possible with a substantial engineering R&D budget increase.

At its NIKKO meeting last august, PCOM has proposed two options. In fact, it is rather one option with two phases.

- phase 1 : 1988-1991
moderate (?) increase of the budget to allow for development of a slim line riser system : $ 6 million are necessary in 3 years.

- phase 2 : after 1991
If the results are positive and drilling through the crust proven possible, then larger investments will be required.

It is TEDCOM's role to help TAMU to evaluate the level of these future investments, the cost and the schedule of the necessary R&D to be undertaken as soon as possible (e.g. use of composite materials).

3. to improve communication and understanding, attendance of major science panels representatives to the engineering meetings (TEDCOM and/or workshops) must be encouraged.

Closer links with DMP are necessary, specially to better evaluate the problems linked to the high temperatures, and to know the maximal temperatures which are to be handled in the next years. TEDCOM and TAMU need also to learn from ODP which future holes are to be fitted with casings, in the prospect of flying reentry and/or long term down hole measurements.

VI. TEDCOM membership

Our 15 member list is complete. Mr D. WILSON from CHEVRON has been replaced by Mr. W. J. LOWE from the same company since May (nomination made official at the last P.COM meeting).

ANNEX 2

Estimated budget for a slim-line riser system
(in $ millions)

Equipments	
drill string, BOP casings	0,75
riser (used)	0,3
on board equipment	0,13
Mud system	0,15
ship conversion	3,00
R&D in tools	1,6
	5,9
10 % for contingency	0,6
Operational Costs	
90 days x 80,000 $/day	0,7
TOTAL	7.2

ANNEX 1

SYSTEM	DAILY OPERATING COST	CASE I EAST COAST-NO. AMERICA 4000m WATER / 4000m PEN.		CASE II NANKAI TROUGH 5000m WATER / 4000m PEN.		CASE III EAST PACIFIC RISE 3000m WATER / 3000m PEN.		INITIAL EQPT INVESTMENT REQUIRED
ODP PRESENT SYSTEM	$82,000	.25 SUCCESS PROB. TOT 120 DAYS TO T.D.	TOT $ 39.4 MILLION HOLE COST	.15 SUCCESS PROB. TOT 135 DAYS TO T.D.	TOT $ 73.8 MILLION HOLE COST	.10 SUCCESS PROB. TOT 100 DAYS TO T.D.	TOT $ 82 MILLION HOLE COST	$ 0 MILLION
18½" OIL FIELD RISER SYSTEM	$162,000	1.0 SUCCESS PROB. TOT 75 DAYS TO T.D.	TOT $ 12.1 MILLION HOLE COST	1.0 SUCCESS PROB. TOT 80 DAYS TO T.D.	TOT $ 12.96 MILLION HOLE COST	1.0 SUCCESS PROB. TOT 95 DAYS TO T.D.	TOT $ 15.4 MILLION HOLE COST	$ 80. MILLION
SLIMLINE RISER	$90,000	1.0 SUCCESS PROB. TOT 75 DAYS TO T.D.	TOT $ 6.75 MILLION HOLE COST	1.0 SUCCESS PROB. TOT 76 DAYS TO T.D.	TOT $ 6.84 MILLION HOLE COST	1.0 SUCCESS PROB. TOT 90 DAYS TO T.D.	TOT $ 8.1 MILLION HOLE COST	$ 5.9 MILLION
MINING SYSTEM	$86,000	.35 SUCCESS PROB. TOT 80 DAYS TO T.D.	TOT $ 19.6 MILLION HOLE COST	.35 SUCCESS PROB. TOT 90 DAYS TO T.D.	TOT $ 22.1 MILLION HOLE COST	1.0 SUCCESS PROB. TOT 125 DAYS TO T.D.	TOT $ 10.7 MILLION HOLE COST	$ 2.9 MILLION
MUD LIFT SYSTEM ON BOTTOM	$94,000	.90 SUCCESS PROB. TOT 82 DAYS TO T.D.	TOT $ 8.56 MILLION HOLE COST	.80 SUCCESS PROB. TOT 88 DAYS TO T.D.	TOT $ 10.34 MILLION HOLE COST	.90 SUCCESS PROB. TOT 100 DAYS TO T.D.	TOT $ 10.44 MILLION HOLE COST	$ 6.0 MILLION

SOUTHERN OCEAN PANEL ANNUAL REPORT 1987

1. 1987 has been an excellent year for SOP, in which the first Antarctic drilling since 1974 has come to fruition, in the shape of two very successful legs. Leg 113 was able to map the development through the Cenozoic of the present circum-Antarctic water mass, with its characteristic siliceous biofacies. We have in prospect a first-class combined stratigraphic record in this water mass, involving siliceous and calcareous microfossils, magnetic reversals, strontium, oxygen and carbon isotopes. There is a record of the separate development of the East and West Antarctic glaciations, and the start of an understanding of Antarctic Bottom Water fluctuation through time. Leg 113 failed to recover Paleogene and Late Cretaceous sediments with a direct record of pre-glacial continental climate, but in recompense found the first evidence from East Antarctica of Early Cretaceous restricted circulation, following Gondwanaland break-up. Underway and basement data seem likely to establish the age and origin of Maud Rise.

Leg 114 recovered excellent siliceous and calcareous pelagic sections from the sub-Antarctic water mass and its southern boundary, throughout the Cenozoic and Late Cretaceous, which will complement and extend those of Leg 113. The effects of opening and further developing the gateway into the South Atlantic, and later Drake Passage, are clearly seen in the sediments, and the origin and evolution of the Northeast Georgia Rise seem likely to be resolved. Particularly in view of the atrocious weather conditions encountered, the achievements of the entire Leg 114 shipboard party are to be applauded.

2. The second half of the planned Southern Ocean drilling offensive is about to begin (in mid-December), and seems in good shape. The most important of the original Southern Ocean Panel targets are preserved within Legs 119 and 120, particularly the north-south paleoceanographic transect of the southernmost Indian Ocean, including Prydz Bay on the continental margin. These legs will provide a valuable check on the results of Legs 113 and 114, and in many instances will greatly improve upon them. Drilling in Prydz Bay stands a good chance of recovering direct evidence of the Paleogene continental climatic decline into glaciation, seen only indirectly by Leg 113, and of testing some of the more end-member hypotheses of glacial history. Leg 120 will also examine Kerguelen Plateau Mesozoic history and basement evolution. SOP applauds the decision to send an ice picket boat with Leg 119, but hopes it will not often be needed.

3. The main lesson of Legs 113 and 114, and the anticipated lesson of 119 and 120, is that high-latitude drilling is no longer encumbered by a narrow "weather window", in that JOIDES Resolution can drill in much worse conditions than could Glomar Challenger. A regular 2- or 3-leg Southern Ocean drilling season could be mounted in any austral summer, with only perhaps one most southerly leg having to be carefully timed to take account of a narrow ice (not weather) window. The question which Southern Ocean proposals always faced previously -

"But can you drill it somewhere else?" - applies now with correspondingly less force. The main technical problem, recovery of coarse, unconsolidated sediment, is common to all latitudes.

4. SOP views its most useful function in the future as a simple projection of what it has done in the past. It wants to continue to act as a strong and semi-thematic supporter and friend of Southern Ocean drilling, with permission to develop or originate proposals as necessary. It does not consider that, with no role or only a book-keeping role for the SOP, Southern Ocean earth science and drilling can be as vigorous and fruitful as it is proving at present. The thematic panels in the past have not always understood the aims or peculiarities of Southern Ocean drilling proposals, before SOP intervention on their behalf.

The SOP believes that with much less drastic revision than the effective neutralising of a host of active scientists in the regional panels, the ODP can achieve a strong thematic drilling program. If the regional panels are neutralised, PCOM will find this more difficult to achieve, not easier, and will be widely seen to be more interested in the cosmetic than in the substance.

5. At its most recent meeting, the SOP examined South Pacific drilling proposals, in advance of any review by the thematic panels under the new regime. There is now a reasonably large body of proposals which appear to be worth consideration by the regional panels. SOP comments are being relayed to proponents, so that proposals may be revised if so desired before any Spring review. Among the more interesting are;

Ross Sea drilling, for East-West Antarctic motion, Transantarctic Mts uplift and its considerable effect on glaciation, and for the continental glacial record.

A composite Australian - Antarctic proposal looking at conjugate margins (1 ice-loaded, 1 not), the Discordance and the early opening history.

A north-south Cenozoic paleoceanographic transect on the EPR flank to map Polar Front and Sub-tropical Convergence growth and migration.

The Chile Triple Junction proposal, growing stronger with each review.

The Antarctic Peninsula margin, a mixture of ridge crest subduction and West Antarctic glacial history, with a young ensialic back-arc basin (Bransfield Strait) nearby.

Note that these are more diverse than previous SOP proposals, reflecting an increased interest in the region and the decreasing influence of the "weather window" effect (3. above). We hope that these and other South Pacific proposals (including the USSAC Workshop output) will be reviewed by the thematic panels in the Spring, since there will be opportunities for more than one Southern excursion while the drill ship is in the Pacific.

P F Barker
Chairman, Southern Ocean Panel
21 October 1987

A Discussion on COSOD I

COSOD: A Critique

In November 1981, the University of Texas at Austin hosted a Conference on Scientific Ocean Drilling (COSOD), which was attended by an international group of nearly 150 earth scientists. COSOD was first proposed by the passive- and active-margins panels of the Joint Oceanographic Institutions for Deep Earth Sampling (JOIDES) as a forum where the earth science community could update scientific priorities and deliberate on the most productive ways to sample rock from the world's ocean basins. The results of this forum had the potential to guide the direction of scientific ocean drilling, particularly as its future was being reshaped.

About a year ago, the proposed program was disproportionately weighted toward drilling on the eastern U.S. margin, and some significant subjects in previous drilling programs became much less important. Unfortunately, the COSOD report is similarly unbalanced, but in a contrary direction. The COSOD report has shifted consideration from the margins to an emphasis on the deep ocean basins. Scientific ocean drilling is vital for research in many fields of the earth sciences, and the *Glomar Challenger* facility has an unmatched record of providing a means to solve problems across earth science disciplines. Therefore, any new drilling program should be of sufficient scope to advance the earth sciences as a whole.

As an advocate of continental margin research, I will review the scientific balance in past ocean-drilling programs, discuss the imbalance in the COSOD report, and give some reasons why drilling on margins should not be slighted in the future ocean-drilling program.

Historical Review

The first 5 years of the Deep Sea Drilling Project (DSDP) has been acknowledged repeatedly as a brilliant success; the earth science community had been debating the outlines of the plate tectonic concept, and DSDP results, in conjunction with analyses of magnetic anomaly patterns, provided convincing evidence for a continuing growth of the earth's ocean floor by spreading at midoceanic ridges. DSDP, however, was broader than just plate tectonic theory: The results not so widely heralded included initial glimpses of the great diversity of ocean basin sediment and oceanic crust and of the tectonic complexity at ocean margins. After its first few years, which were structured about a geographic framework, DSDP became the International Program of Ocean Drilling (IPOD), and the JOIDES advisory panels were reconstructed to reflect a sharper topical emphasis. IPOD was justified in the NSF as a previously successful program with singular emphasis on a potential scientific breakthrough, although in hindsight it probably would have been better to justify IPOD as an ongoing program for the advancement of earth sciences research. Thus, on the basis of only promotional documents, the emphasis of the scientific ocean-drilling program was far narrower than the subsequent drilling and scientific studies showed.

In IPOD, scientific emphasis on plate tectonics was replaced by the study of igneous oceanic crust. Crustal sampling was of great interest because the study of fragmented ancient igneous oceanic crust on land had led to some exciting new concepts, and perhaps the model developed by earth scientists on land could be confirmed at sea, much as plate tectonics had been. After the first few years of IPOD, however, it became apparent that confirmation of a major hypothesis equivalent to that of the initial 5-year DSDP program was not so readily achievable. The questions regarding oceanic crust were appropriate, but drilling deep enough to provide the major answers has required 10, to possibly 15, years of drilling rather than the 4 to 6 years originally proposed for IPOD.

The proposed successor to IPOD, the Ocean Margin Drilling Program (OMDP), was highlighted not by a scientific topic but by a technical emphasis involving a special drilling platform, an extension of drilling technology, and ultradeep penetration on passive margins along the eastern United States. As initially proposed, OMDP had a scientific scope narrower than DSDP and IPOD, which traditionally contained balanced scientific programs but emphasized a single highlighted topic such as plate tectonics or oceanic crust. Earth science fields that were making great scientific strides with the *Glomar Challenger* were to be severely curtailed for at least a decade by OMDP, as well as the specialized configuration of the new drilling platform; both the specialized new drilling ship and the *Glomar Challenger* could not be funded simultaneously. Thus OMDP became controversial.

OMDP was scientifically better balanced in the later phases of its formulation, but it never quite lost the stigma of its initially proposed first decade of drilling a few expensive deep holes on the eastern U.S. margin. Therefore, much of the impetus for COSOD was to reestablish a scientific balance for the follow-on program to IPOD and thus to depolarize the scientific community. Also, the oft-cited scientific basis for OMDP was the results from a conference on the Future of Scientific Ocean Drilling (FUSOD) in 1976. By 1980, however, new scientific results had rendered large parts of the FUSOD report obsolete, including some parts about eastern U.S. passive margins proposed for OMDP, and so an update on the status of scientific knowledge on ocean margins was needed.

COSOD

COSOD was organized around five topical working groups that developed position papers which were to form the framework for discussion at the general conference and for the COSOD report. From the beginning, this organization put a major emphasis on deep-ocean topics, and most topics specific to the development of continental margins were covered with other topics in one of the five working groups on tectonics. The organization gave researchers the opportunity to fully develop new subtopics in sedimentology and paleoceanography with a very full section on the origin and evolution of ocean crust. Indeed, many of the topics discussed in the COSOD report were similar to topics being developed within the JOIDES advisory panels, and these topics were published for the first time. Within the tectonics section, the discussion on modeling—to separate mechanical and thermal from static mechanisms along passive margins—is at the forefront of present passive-margin research. However, considering that the emphasis of the less than 1-year-old proposed OMDP was ocean margins, specific discussions of many important ocean margin research topics are conspicuously absent, and others are briefly mentioned under various headings and buried in the body of the report. Perhaps this abrupt shift in emphasis may stem from unforeseen events just before the general conference, when several industrial partners pulled out of OMDP. OMDP was suddenly dead, and the OMDP advocates for ocean margin research seemed uninfluential or silent during the general conference discussion.

In its summary, the COSOD report contains only one passive- and two active-margin topics in its 12 top-priority scientific program recommendations. Passive-margin drilling, a major topic of the FUSOD report, is allotted only six pages of discussion in the 100-page body of the COSOD report, and the six pages of discussion specific to all active-margin problems is equivalent to the pages allotted for some topics never developed before as drilling targets. There can be little doubt of a sudden shift in topical emphasis when one compares the COSOD report with the FUSOD, OMDP, and other oversight reports written within the past 5 years.* This major emphasis differs considerably from that of the recent International Workshops on the Future of Marine Geoscience (July 1982), sponsored by the International Union of Geological Sciences, and it reflects only little of the white papers prepared for COSOD by the JOIDES active- and passive-margins scientific advisory panels. Furthermore, the absence of emphasis on continental-margin topics is not reflected by a corresponding shift of interest within the ocean margin scientific community during the year since the OMDP was last reviewed (in the JOIDES program plan review for the NSF, June 1981).

Continental Margins and Ocean Drilling

Scientists participating in DSDP cruises come from both oceanographic- and nonoceanographic-oriented institutions. Traditionally, among the scientists from oceanographic institutions are those most heavily involved in research of deep ocean areas. On the other hand, scientists from nonoceanographic institutions commonly study the submarine extensions of the continents. Thus, active participation by scientists from both oceanographic and nonoceanographic institutions in DSDP is one indicator of general scientific interest, although it is an imperfect one because single scientists' interests readily move across the continental/oceanic-crustal transition. Scientists from nonoceanographic institutions have formed most of the scientific parties aboard the *Glomar Challenger*. Slighly more than 50% of the legs 1–85 shipboard scientists from the United States are from nonoceanographic institutions, and the proportion of nonoceanographic scientists from other countries is much higher (according to DSDP statistics). Most members (about 60%) of the present JOIDES scientific advisory panels are affiliated with nonoceanographic institutions, although the planning and executive committees are composed of representatives from only 'Joint Oceanographic Institutions.' Thus, the organizational impetus for scientific ocean drilling has come from the oceanographic community, whereas the majority of the participants belong to nonoceanographic institutions.

Increased participation is vital to the next scientific ocean-drilling program. At COSOD, a specific recommendation was made to refit the *Glomar Explorer* for riserless drilling. Optimum *Glomar Explorer* operation will involve about twice the volunteer scientific staff and will draw on a larger group of scientists than does the *Glomar Challenger*. Thus for optimum shipboard staffing the next ocean-drilling program needs to appeal to the interests of earth scientists in the broadest sense, including those from nonoceanographic institutions.

For many scientists the leading edges of the continents represent a bridge between modern and ancient processes; many of the dynamic processes that have shaped and added to the volume of the continents are still active but hidden beneath the sea. The greatest amounts of economic, mineral and energy resources come from continental crust; research on these mineral deposits would no doubt enhance the relevance of scientific ocean drilling for a significant segment of the earth science community. Even researchers of deep-ocean sediment sequences on land must determine the overprint of marginal tectonic processes that elevated those sequences and remove that overprint to discern original sedimentary character. In the post-plate tectonic era of a more global view of earth science problems, the history of the oceans cannot be comprehended well without considering the ancient margins any more than that of the continents can be comprehended well without considering their present submerged extensions.

Conclusion

It is unlikely that the major scientific emphasis on deep-ocean basins in the COSOD report reflects a general consensus of the earth science community; the emphasis of COSOD seems rather to reflect many of the scientific interests of less significance in OMDP. The earth science community is best served by a broadly balanced drilling program for the following reasons:

1. A scientific drilling program needs to be justified for funding as a vitally needed facility to explore oceanic areas and to advance knowledge across the earth sciences. The credibility of the earth science community becomes precarious if a potential breakthrough in a single field and of an importance equivalent to the culminating battle of the plate tectonic revolution is used to justify a scientific drilling program every 5 or 6 years.
2. The drilling ship is used not only by members of the oceanographic community but also by members of many other earth science disciplines; it is used as well by the international scientific community. A scientific drilling program should thus appeal in the broadest way to scientists with both continental and deep-ocean interests and should include major interests of the international earth science community. One great achievement of IPOD has been the interdisciplinary and international involvement it has promoted among earth scientists.
3. The directions of a future scientific drilling program should be developed to attract active participation from the world's best scientists, considering the potential of a new larger drilling ship with more adequate laboratory spaces and the ability to recover more core than the *Glomar Challenger*.

In conclusion, the COSOD report emphasizes deep-ocean areas of research, which should be balanced with the many continental-margin problems mentioned elsewhere in recent oversight reports or the JOIDES literature. As much as a third to a half of some recent international oversight reports have been devoted to continental-margin topics. Thus, a good guide to scientific-drilling-program balance is probably to be found in a synthesis of these international oversight reports. The formulation of a successful scientific drilling program to follow IPOD will be a test of combined scientific and administrative skill that will rival that of the committee which first developed DSDP and guided it through its most successful, early years.

Roland von Huene
U.S. Geological Survey
Menlo Park, California

COSOD: A Reply

In his critique of the Conference on Scientific Ocean Drilling (COSOD), Roland von Huene claims that COSOD presented an 'unbalanced' viewpoint with emphasis on too many deep-ocean objectives at the expense of continental-margin drilling problems. Although we both fully agree that a future program of scientific ocean drilling is an essential component of research in the earth sciences, von Huene questions whether the emphasis on the deep-ocean basins in the COSOD report reflects a general consensus of the earth science community. Any subset of a community is, of course, suspect as a true sample of the entire community. However, I believe that the 150 scientists from nine different countries who participated in COSOD and in the compilation of the report do, in fact, reflect the mainstream of scientific drilling interests as presently constrained by available and potentially available drilling technology. In order to demonstrate that this is so, I shall first comment on von Huene's 'Historical Review' of scientific ocean drilling, expand on the organizational aspects of COSOD, and finally comment on the scientific recommendations.

As stated in the critique, the most visible successes of the first few years of deep-sea drilling centered on the demonstration of the viability of the hypothesis of plate tectonics, although the main results actually demonstrate the more limited hypothesis of seafloor spreading. After these first few years, the project was expanded to the International Program of Ocean Drilling (IPOD), whose main scientific emphasis was the study of igneous oceanic crust, according to von Huene. This latter statement is simply not true, and it is very curious that it should be made by the past chairman of the Active Margin Panel of JOIDES. In fact, the IPOD program was basically guided by four 'problem panels,' the Ocean Crust, Active Ocean Margin, Passive Ocean Margin, and Ocean Paleoenvironment panels. I believe that these panels were always populated with top-notch international scientists who made sure that their programs each received equal drilling time and emphasis. In fact, most of the latter successes of the program have not been in the area of ocean crustal drilling, which has proved to be a difficult technological problem, but in paleoenvironment problems; these successes coming with the advent of the hydraulic piston corer and in the tectonics of active margins as revealed by drilling across the island arcs in the western Pacific Ocean.

As IPOD continued into the mid-1970s, the Ocean Margin Drilling Program (OMDP) was formed as a joint U.S. oil company–academic effort to investigate the passive continental margins of the United States. As von Huene correctly stated, this program never had broad support and collapsed in October 1981, when the U.S. oil companies resigned from the program. Coincidentally, COSOD was held a month later, in November 1981. It was not organized as a response to the failure of OMDP but was planned about 6 months in advance as a means to amalgamate the scientific ocean drilling community that was polarized by plans for two very different drilling programs. On the one hand was a *Glomar Challenger*-based continuation of the IPOD effort, and on the other was the OMDP investigation of passive continental margins with the blowout prevention and riser capabilities of *Glomar Explorer*.

Von Huene claims that the organization of COSOD put a major emphasis on deep-ocean topics and that topics specific to continental margins were covered in only the tectonics working group. The organization of COSOD was based on geologic processes, not geographic areas, so the various aspects of continental margins are discussed in several different places in the report. For instance, the suggested outline composed by the COSOD Steering Committee for the Working Group on Marine Sediments is listed below.

Origin and Evolution of Marine Sedimentary Sequences

A. Sedimentation of pelagic and continental margin sequences
   1. Nature
   2. Provenance and primary productivity
   3. Deposition and erosion processes
   4. Dissolution
   5. Diapirism
   6. Seismic stratigraphy and physical properties
   7. Facies models
B. Global sedimentary mass balance
C. Post-depositional alteration of sediments
   1. Diagenetic alteration of:
      a. Minerals
      b. Organic matter
   2. Vertical and lateral deformation
   3. Submarine hydrology

I believe that this outline represents a balanced approach to deep-sea and continental-margin sedimentary sequences without a bias toward either area. Three of the top-priority sedimentary problems described in the COSOD report are in large part continental-margin topics and had their origins in this working group. Von Huene apparently dismisses these as exclusively deep-ocean topics, but it is difficult to understand (a) the response of marine sedimentation to fluctuations in sea level, (b) sedimentation in oxygen-deficient oceans, or (c) the global mass-balancing of sediments without studying both continental-margin and deep-sea sedimentary sequences. In reference to sea level fluctuations the COSOD report recommends that 'Drilling on transects across seismically well-documented passive margins (e.g., North Atlantic, Gulf of Mexico, western Australia) is needed to answer these questions.' Sedimentation in oxygen-deficient oceans is also viewed as a problem to be solved with transects from the continental shelf to the deep sea across such margins as southwest Africa, southern Arabia, and the North Atlantic. Finally, it has been estimated that about one third of the sediments on the earth lie on passive continental margins, and these would certainly figure prominently in any global mass-balancing study. Other problems of lower priority recommended by this working group include submarine fans, slides, slumps, and debris flows that are all continental-margin phenomena.

In summary, many of the geologic processes identified by COSOD as top priority, and other problems, cannot be characterized simply as 'deep sea' or 'continental margin' topics. They are problems that must be solved by a more broadly based drilling program. One of the general recommendations of the COSOD Steering Committee is that 'The integration of continental geology and marine geology should progress through scientific drilling programs. We encourage this integration to proceed through the planning and execution of geophysical and drill-site transects from the dry land to the deep sea across well chosen continental margins.'

Von Huene claims not only that COSOD had a deep-sea bias but that it did not represent the mainstream of thinking about major problems in the earth sciences. However, COSOD was attended by several members of a special Committee on Ocean Drilling appointed by the Geological Sciences Board of the National Academy of Sciences to study the problem of scientific ocean drilling. One of the statements from their meeting held the week after COSOD is, 'the twelve priority topics of COSOD are not all of equal importance, but collectively encompass many of the more exciting problems facing geology today.' This statement by an independent review group made up almost entirely of non-oceanographic earth scientists stands in sharp contrast to von Huene's claim of an unbalanced viewpoint at COSOD. A draft of their final report to the National Academy of Sciences and to the U.S. Congress quotes extensively from the COSOD report as 'one of the best summary statements for a continued scientific ocean drilling program,' and goes on to state in part, 'The number of interested personnel is ever increasing. Many new young investigators are involved.' witness the composition of the COSOD meeting in Austin, November 1981. This was a meeting of "proponents" of drilling, more than half of whom have yet to sail on *Challenger* or be deeply involved in DSDP analyses.'

On March 18–19, 1982, the National Science Board held a special meeting to consider the future of scientific ocean drilling. They unanimously approved and strongly endorsed the continuation of a scientific ocean drilling program, the formation of the Advanced Ocean Drilling Program (AODP), and the continuation of plans to convert the *Glomar Explorer* as a riserless drill ship. The scientific justification presented to the National Science Board was based on the twelve top-priority scientific programs outlined at COSOD. I submit that COSOD was attended and has been reviewed by a broad spectrum of scientists both inside and outside the oceanographic disciplines. I consider it extremely unlikely that the subsequent COSOD report is an unbalanced compilation of biased scientific opinions.

In summary, I believe that COSOD is a true reflection of the general consensus of the earth science community regarding future scientific ocean drilling. There is no question that its emphasis is different than OMDP, and it is likely that this was influenced by the collapse of OMDP a month before the meeting. With the demise of OMDP went the likelihood of any scientific ocean-drilling ventures in the near future that would be supported by a riser and blowout prevention system necessary for drilling most deep holes on both active and passive continental margins. Thus, it is only logical that the scientific emphasis is more on deep-ocean problems. However, COSOD was designed as a completely open meeting to examine all aspects of scientific ocean drilling. The twelve top-priority COSOD recommendations, as well as a large number of other recommendations in the report, are a combination of deep-sea and continental-margin topics that will require a world-wide program of long-term drilling for their solution. Some of these problems can be solved with the *Glomar Challenger;* others will require a *Glomar Explorer*-type of drilling platform, but not necessarily well-control. Finally, the deeper holes on continental margins will require riser and blowout prevention capabilities that are presently beyond the practical limits of our finances. However, just because these problems cannot be solved at present does not mean that they are farther from our minds.

Roger L. Larson
Graduate School of Oceanography
University of Rhode Island,
Narragansett

The Conference on Scientific Ocean Drilling (COSOD) was initiated by the executive committee of JOIDES, who appointed the steering committee in April, 1981, and directed them to examine the question, 'How can drilling and associated scientific programs be organized and coordinated to attack the most important scientific problems in the most orderly and productive way?' The conference was held November 16–18, 1981, at the University of Texas at Austin, and discussions were focused on the following working groups: (1) Origin and Evolution of the Oceanic Crust; (2) Tectonic Evolution of Continental Margins and Oceanic Crust; (3) Origin and Evolution of Marine Sedimentary Sequences; (4) Causes of Long-Term Changes in the Atmosphere, Oceans, Cryosphere, Biosphere, and Magnetic Field; and (5) Tools, Techniques, and Associated Studies. The working groups recommended a total of 12 top-priority scientific programs, and the conference as a whole concluded that *Glomar Explorer* is clearly the preferable vessel for future scientific ocean drilling. Summaries of the working group and steering committee recommendations can be found in *Eos, 62*(48), December 1, 1981; *62* (51), December 22, 1981; and *Nature, 294*, 613, December 17, 1981. Copies of the full report can be obtained by writing to JOI, Inc., 2100 Pennsylvania Ave., N.W., Washington, D.C. 20037.

United States Department of the Interior

GEOLOGICAL SURVEY
OFFICE OF ENERGY AND MARINE GEOLOGY
BRANCH OF ATLANTIC MARINE GEOLOGY
WOODS HOLE, MA 02543

October 29, 1987

MEMORANDUM

TO: Chairman, JOIDES Planning Committee

FROM: Chairman, JOIDES Pollution Prevention and Safety Panel

SUBJECT: Report of the Safety Panel Meeting, 6 October 1987, College Station, TX

The JOIDES Safety Panel met at ODP/TAMU offices in College Station, TX on 6 October 1987 to review ODP Legs 119 and 120. Present at the meeting were:

JOIDES PPSP Members:

M. Ball
G. Claypool
D. Mackenzie
G. Stober

ODP/TAMU Safety Panel:

L. Garrison
K. Burke
H. Wories

Co-Chief Scientists:

J. Barron (Leg 119)
R. Schlich (Leg 120)
W. Wise (Leg 120)

JOIDES/ODP Site Survey Data Bank, LDGO:

C. Brenner

ODP/TAMU:

J. Baldauf
G. Foss
A. Palmer

Unable to attend were D. Roberts, G. Campbell, P. Ziegler, R. Byramjee, A. Green (JOIDES Safety Panel).

The next meeting of the JOIDES Safety Panel was planned for 6 December 1987 in San Francisco, CA to review ODP Leg 121.

I. Legs 119 and 120 Safety Review

Ocean Drilling Program Legs 119 and 120 will complete a latitudinal transect in the Southern Ocean between Kerguelen Island (49°S) and Prydz Bay, Antarctica (67°S). This transect will study the Late Cretaceous to Holocene paleoclimatic history of East Antarctica, the origin and tectonic history of the Kerguelen Plateau, and the Late Mesozoic rifting history of East Antarctic and India. ODP Leg 119 will drill sites on the northern and southern Kerguelen Plateau and along the Prydz Bay continental margin, while ODP Leg 120 will drill several sites on the central portion of the Kerguelen Plateau.

A. Leg 119 North Kerguelen Plateau

KHP-1 Approved for drilling to 1400 m. This hole must be drilled prior to KHP-3 and must be cored continuously and monitored for existance of potential reservoir rack coupled with significant indications of thermogenic hydrocarbons. If potential reservoir rocks and significant thermogenic hydrocarbon shows are encountered further drilling is disapproved.

KHP-3 Approved as proposed to 1700 m. The upper 320 m of this hole may be washed down if no hydrocarbons are encountered in the Oligocene and younger section of KHP-1.

B. Leg 120 South Kerguelen Plateau

SKP-1 Approved as proposed to 450 m.

SKP-2 Move to shot point 5600 on Line MCS 47-05 to avoid possible roll-over structure at depth beneath proposal location. Approved to 1700 m.

SKP-3 Approved to 800 m to avoid penetrating a sequence of reflections forming a pinch out at depth.

SKP-4A Approved as proposed.

SKP-6A Approved as proposed.

SKP-6B Move to shot point 500 on Line MCS 47-07. Approved to 1000 m.

SKP-8 Approved as proposed.

II. Leg 119, Prydz Bay: Sites approved at the PPSP meeting of 5-6 June in Los Angeles were reviewed for panel members unable to attend that meeting.

III. Lou Garrison led the panel through a preliminary discussion of drilling plans for the Western Pacific beginning in October of 1988 when the drillship exits the Indian Ocean.

Malcolm M. Bell

DRAFT MINUTES

SEDIMENTS AND OCEAN HISTORY PANEL

Ocean Research Institute
University of Tokyo
August 31, September 1 and 2, 1987

Members Present:

A. Droxler (Rice U.)
P. Frohlich (L-DGO)
R. Garrison (UCSC)
M. Goldhaber (USGS)
D. Kent (L-DGO)
L. Mayer (Dalhousie, Chairman)
P. Meyers (U. of Michigan)
W. Normark (USGS)
T. Saito (Yamagata, Japan)
A. Schaaf (GIS, France)
N. Shackleton (Cambridge, England)
I. Premoli Silva (Milan, Italy)
R. Stein (Giessen, FRG)

In Attendance:

P. Ciesielski (SOP)
J. Ingle (WPAC)
H. Okada (ARP)
V. von Rad (PCOM)
C. Sancetta (CEPAC)
A. Taira (PCOM)

Absent:

W. Berger (SIO)
R. Embley (USGS)
R. Sarg (Exxon)

1. Opening Remarks and Approval of Previous Minutes:

1.1 The meeting began at 8:45 with introduction of new members and welcome from Japanese ODP office.

1.2 The absence of a TAMU representative was noted with dismay, especially considering the upcoming discussion of the TAMU-proposed sediment classification scheme.

1.3 The minutes of 9 - 11 March meeting were accepted.

2. PCOM Report: (von Rad)

2.1 Brief report on Formation Microscanner was presented. SOHP comments: The tool is potentially extremely useful particularly in delta/deep-sea fan environments and for black shale studies. Questions raised included:

1. What is resolution on heaving ship?
2. How well can true subbottom depth be determined?
3. Appears to only work in indurated sediments which excludes important parts of the section
4. What are the costs associated with processing?

The SOHP is enthusiastic about the potential of the Formation Microscanner but requires further information on it.

2.2 Indian Ocean program reviewed - of note to SOHP was revised Exmouth/Argo program (see Indian Ocean discussion)

2.3 WPAC - first year finalized; PCOM questions to SOHP regarding Banda, Nankai and N.E. Australian Margin raised (see WPAC discussion)

2.4 CEPAC: PCOM requests that SOHP rank six top-priority programs within CEPAC prospectus (see CEPAC discussion)

2.5 PCOM directives re: new panel structure presented

2.6 Publication policy was discussed:

The SOHP endorsed the recommendations of the IHP as presented in the minutes of their 3 - 6 August meeting.

It was brought to the attention of the SOHP that samples for the paleontological reference collection have stopped coming to the Japanese center. We request that the IHP and TAMU look into this.

2.7 Prydz Bay: The Chairman presented a brief review of the events surrounding the Prydz Bay program.

The SOHP applauds PCOM's courage in deciding to retain this high-priority scientific program despite the severe budgetary constraints imposed.

3. Technology Issues: (in lieu of TAMU Report)

3.1 P. Cieselski reported that significant time was saved on Leg 114 by dropping sinker bars directly after core barrel (30 min/core).

The SOHP urges that TAMU adopt this technique as routine procedure or justify why it cannot.

3.2 Navidrill still has problems.

The SOHP emphasizes that the ability to recover material in alternating lithologies is critical for the Kerguelan program and urges that every effort be made to perfect this technique.

3.3 Severe problems with magnetized core barrels and the core orienting device were encountered on Leg 115.

The magnetic signal provides one of our most critical stratigraphic tools. The SOHP has repeatedly, and continues to, urge TAMU to resolve problems associated with acquiring a reliable magnetic record.

3.4 Our ESF representative reported that ESF scientists have been frustrated by the rigidity of the shipboard sampling policy and poor conditions in the paleontology lab. The SOHP has continually urged TAMU to adopt a flexible sampling policy and encourages offended scientists to document their complaints and forward them to our Panel and to TAMU.

4. Sediment Classification Scheme:

Having finally received the requested input, the SOHP hoped to conclude discussion of the sediment classification scheme. Unfortunately, in the absence of a TAMU representative, the discussion was rather one-sided. As stated in our detailed comments on the scheme (SOHP minutes of 20, 21 October meeting, Appendix A), the Panel applauds the development of this comprehensive yet reasonable approach. TAMU has responded to the 10 points raised by SOHP and the Panel accepts their responses with the following exceptions:

1. Replace the term "neritic" with "shallow water carbonate"
2. Add the terms "chert" and "limestone"
3. Replace "terrigenous" with "siliciclastic"
4. Replace "marly" with "mixed"

Without a TAMU representative, a "final negotiated resolution" was impossible. The chairman will report these results to TAMU and if they cannot resolve the differences, a conference call between appropriate TAMU and SOHP representatives will be established.

5. Atlantic Regional Panel Report: (Okada, Meyers)

Five workshops have been proposed for the next two years.

6. Southern Ocean Panel Report: (Meyers, Ciesielski)

Ciesielski requested a strong statement from SOHP with regard to the need for drilling the S.E. Pacific. The Panel is sympathetic with need for work in this region, but in the absence of any proposals has very little to work with.

7. Indian Ocean Panel Report: (von Rad, Droxler)

Exmouth Plateau (Leg 122): The Mutter and Larson proposal to reposition Site EP2 to EP12 was reviewed. While the SOHP is intrigued with the question of examining the differences between thin-skinned, detachment style deformation and thick-skinned block rotations, we prefer to defer discussion of the relative merits of the crustal objectives of the Mutter, Larson proposal to the Tectonics and Lithosphere Panels.

From a SOHP standpoint, we are very supportive of the proposed change. EP12 provides the opportunity to examine several sites with different tectonic settings, but with the same depositional/sea level history and therefore presents the opportunity to sort out the roles of sea level and tectonism in sequence development. EP12 also serves as a correlative site to EP7, our highest priority site in the area, as well as forming a cross-plateau transect with EP6 and EP7.

The proponents have revised their drilling-time estimates and presented a new proposed prospectus for Leg 122 (von Rad memo of 18 August).

The SOHP strongly endorses the program proposed by the Leg 122 proponents. We differ only in that we rank Site 10A of higher priority than Site 12. Site 10A is ranked above 12 because it provides the best opportunity to sample Triassic pre- and syn-rift sediments and the break-up unconformity. We urge that all four sites EP7, EP12, EP10A, and EP6 be drilled and that TAMU explore the feasibility of using Port Hedland as a port stop and thus save significant transit time.

The SOHP would like to complement the Exmouth Plateau proponents for their careful documentation of their program and for their sincere efforts to produce a manageable leg that will meet many of our primary objectives.

Argo Abyssal Plain (Leg 123): **SOHP supports PCOM's recommendation for Leg 123 to consist of AAPIB and EP9. If basement drilling at AAPIB is unsuccessful, we urge that the time be directed toward AAP2.**

8. Western Pacific Panel: (J. Ingle)

N.B. The WPAC third prospectus did not include priorities from our March 1987 meeting. These are:

1. N.E. Australian Margin
2. Japan Sea
3. South China Sea (Basin)
4. Sulu Sea
5. South China Sea Margin
6. Bonin - Site 6

J. Ingle, on behalf of WPAC, asked SOHP to reconsider the S. China Sea Margin Transect proposal pointing out that the S. China Sea Site adopted in the PCOM first year program was a basin site. The SOHP is supportive of the S. China Sea Margin Transect. In conjunction with the basin sites, this program could provide a complete sedimentary history of the basin (the deep basin sites only sample post-Oligocene). In addition, the transect should provide insight into intermediate water mass history and sea level fluctuations on a relatively young passive margin (see minutes of March 9, 10, 11 SOHP meeting for detailed discussion).

After discussing the program, the SOHP voted unanimously to leave priorities for WPAC drilling as listed above. The Panel emphasizes that these six programs are ranked above numerous other WPAC programs and thus all address first priority SOHP objectives.

Banda-Sulu-South China Sea Basins:

Noting PCOM's directive to TECT and LITH Panels to consider single leg program for this transect, the SOHP expressed concern over the potential loss of paleoceanographic objectives with the cut back of the program. The SOHP viewed this transect as a potential to evaluate the oceanic response of a set of basins with a spectrum of tectonic environments and is concerned that one site in each basin may not be enough to define critical parameters. If only one site is possible in each basin, the SOHP recommends the following sites.

Sulu Sea: two sites preferred here (margin and basin) to evaluate sill control. If only one site possible **SOHP priority is Sulu 4** in order to evaluate history of anoxic waters.

Banda Sea: **SOHP priority B1** (thicker section)

South China Sea Basin: **SOHP priority S5** (thicker section)

Nankai:

The SOHP has been asked to examine sites along the Nankai Transect for a possible geohydrology program.

The SOHP was extremely concerned by this directive. As far as we know there is no proposal in the system to do this work. If there is, the SOHP has not received it. SOHP has received no proposals for the Nankai area (they have been directed to other panels). This appears to be quite a turnaround by PCOM. On the one hand, we are constantly told that we can only respond to proposals, and now we are asked to comment on a program for which we've received no information.

The SOHP defers discussion of this program until we receive a proposal or the appropriate background material.

The directive brought up the more general question of the SOHP's attitude toward problems of hydrogeology. Inasmuch as it does loosely appear to fall within our mandate, the SOHP will seek opportunities to incorporate geohydrology objectives into legs and sites. Recent Legs along plate margins have discovered complex patterns of pore fluid movement which appear to be of fundamental significance to tectonism, diagenesis and global chemical fluxes. Accordingly, we urge strongly that special consideration be given, in planning and staffing future legs (such as Nankai I), to exploiting these exciting geohydrological developments. This should include provision of adequate time and equipment for appropriate in situ measurements and sampling (e.g. temperature, fluids, gases) as well as selection of scientific staff with requisite geochemical skills; critical also is the allotment of sufficient technical help (technicians) for shipboard measurements.

We are concerned, however, that the SOHP has limited expertise in this field and feel that the science would be better addressed within the framework of a separate geochemistry working group.

With regard to the Nankai area, the Panel wondered if the Oregon margin might not be a better place to address these problems.

N.E. Australian Margin:

The chairman related the proponent's (Davies) strong concern over the comments of the Site Survey Panel re the N.E. Australian margin program. The problem seemed to stem from a communication lapse (the Site Survey Panel did not know that detailed site surveys were forthcoming) and appears to be resolved.

PCOM's concerns over this program were related to the SOHP. The SOHP continues to consider the N.E. Australian Margin program as its highest priority program in WPAC. In light of PCOM's concerns, the SOHP will issue a special document dedicated to N.E. Australian Margin drilling.

Mississippii Valley Type Mineralization: (MVT)

The SOHP (particularly the Chairman) has received considerable input with regard to our previous comments about the MVT program. We discussed the new proposal for this work in great detail and conclude that while the host environment of the MVT ore deposits and that of the N.E. Australian Margin are indeed similar, the lack of a hydrostatic or tectonic mechanism to drive mineralized fluids through the system weakens the analogy to the point that we cannot argue for sites in addition to those designed to address our primary N.E. Australian Margin objectives. We do, however, strongly support the notion of evaluating the pre-mineralization host environment and urge that the N.E. Australian Margin program be designed to accommodate the geochemical and diagenetic measurements at the primary sites. (N.E. Australian 1 and N.E. Australian 12).

The detailed rationale for this is presented in Appendix B.

SOHP recommendation: (12 for, 1 abstain)

1. MVT proposal does not provide sufficient justification for additional N.E. Australian Margin sites.

2. SOHP strongly encourages accommodation of MVT proposal objectives at existing N.E. Australian sites.

9. CEPAC: (Sancetta)

At our previous (March '87) meeting in Menlo Park, the SOHP devoted an entire day to CEPAC discussions. We began with a presentation of the CEPAC preliminary prospectus, noted gaps and then used these discussions to develop focused, CEPAC-oriented themes. Based on these discussions, the SOHP developed the following prioritized themes to guide CEPAC planning.

1. Pacific Neogene Paleoenvironment:
   High resolution surface and bottom water Neogene history of the Pacific and its relationship to paleoclimate, sea level, and tectonic events.
   Example programs: Eq Pacific Paleoenvironments (221E);
   O.J. Depth Transect (142E)

2. Mesozoic-Paleogene Pacific Paleoceanography:
Evolution of late Mesozoic through Paleogene paleoclimates in high and low latitudes.
Example programs: Sounder Ridge-Unmak Plateau (195E, 182E); Atolls (some N. Pacific Gyre sites)

3. Old Pacific Crust:
A look at Cretaceous open ocean.
Example program: Mariana/Nauru Basin (261E)

4. Anoxic Events:
Time stratigraphy, distribution and significance of oceanic carbon in low latitude open ocean settings. Correlation with other Cretaceous anoxic events, role of black shales in global carbon cycles; importance of carbon preservation vs productivity; effect of volcanism and role of bathymetry and climate in developing upwelling.
Example program: Shatsky Rise (253E)

5. Atolls and Guyots:
Drowning history, sea level and subsidence curves; continuous pre-Neogene paleoclimatic record from low latitudes; early Cretaceous to Recent shallow water biota; diagenesis as function of sea level history and volcanic episodicity.
Example program: (Ogasawara (260D), Marshalls, Pacific Guyots, 202E, 203E)

6. Fans and Sedimentary Processes:
Modern analogs to ancient deposits; test models for fan development; relationship of turbidite deposition to tectonic and sea level history.
Example programs: Navy Fan (250E), Zodiak Fan (241E), Monterey Fan

The rationale for this ranking can be found in the discussions of individual programs. The SOHP emphasizes that these are its highest ranked themes for CEPAC drilling and that we would like to see each of these issues addressed in the Pacific. We are very concerned about the time constraints placed on the Pacific program and ask PCOM to seriously consider the time allotted to Pacific drilling.

Detailed discussions of the individual programs mentioned as examples above can be found in the CEPAC section of our March minutes (Appendix A).

C. Sancetta, CEPAC liaison (for Bill Sliter), presented the most recent CEPAC prospectus consisting of ten programs, many of which incorporate the SOHP primary themes. The most glaring exception is the Equatorial Pacific Paleoenvironments, but CEPAC will be reconsidering this program at their next meeting.

Given the most recent PCOM directive regarding new guidelines for the planning and proposal review process, and given the fact that a number of new proposals have come in since our last meeting, the SOHP decided to individually review each proposal that has been submitted to the panel, evaluate how well they fit into our previously established themes, and then use this discussion to examine our themes and see if they need amending.

As of our Tokyo meeting, the SOHP had received 33 CEPAC proposals.

At our March meeting, we reviewed the following proposals: 142, 182, 195, 199, 202, 203, 221, 222, 247, 250, 260, 257 (see Appendix A for specific comments). These were briefly discussed in Tokyo and attention then turned to new proposals.

1. Meiji Tongue and Detroit Seamount (259/E):
   - history of deep temperature
   - locale of deep water formation
   - ice-rafting history
   - deep current history
   - high-latitude

   Extremely important to SOHP in that it provides one of the best chances to recover a carbonate-rich sequence from the N. Pacific SOHP Theme 1: Only two sites proposed--can be added to N. Pacific Gyre program.

2. Geisha Seamounts (280E)
   - ages of seamounts along pre-Emperor hotspot path

   Only minor SOHP interest because most seamounts have less than 100 m sediment. Occasional opportunities. Some overlap with Winterer guyots proposal (203/E), but Winterer program needs wide geographic separation to address global sea level questions.

3. Deep drilling in the M-Series, West Pacific (287/E)
   - two sites to sample oldest Pacific crust and extend M sequence to about M-38
   - age and nature of mid-Cretaceous volcanic crust
   - age and paleoenvironment of Jurassic - 8 - Cretaceous sediment

With discouraging results of Nauru Basin site surveys, this proposal may represent the only chance to sample the open ocean record of the Cretaceous. As with the Nauru Basin proposal (262/E), this program depends on the ability of site surveys to demonstrate "windows" through the volcanic event and a drill string capable of withstanding the severe conditions imposed by the program. The SOHP will consider this program in the place of 262/E as its candidate for Old Pacific Crust drilling, a very high priority.

4. Queen Charlotte Transform Fault (256/E)
   - tectonic history and structure of very obliquely convergent margin

   Proposal does not discuss SOHP considerations though there is some possibility of recovering a pre-Miocene sea level history through examination of turbidite history, but this is difficult to do. In general, little SOHP interest.

5. Hawaiian Hotspot (282/E)
   - date age of Hawaiian Ridge and get accurate estimate of Pacific Plate motion

   SOHP had trouble with concept of "oceanic front" created by Hawaiian Swell--is there stratigraphic or physical oceanographic evidence for this? Also, the presence of "abyssal plain" fossiliferous clay--brown clay at the southwestern foot of Hawaiian Ridge needs further documentation. Finally, there needs to be better documentation of sediment column at proposed sites; the moat has been locus of much mass wasting.

6. Escanaba Trough (Gorda Ridge) (284/E; 224/E)
   - volcanic and geochemical processes in sediment dominated spreading center

   Questions of diagenesis and mineral alteration are of interest to SOHP. Sediments in trough may have sea level signal (alternations between pelagic and turbidites) but will be difficult to separate from climatic signal.

7. Gulf of California (275/E)

   The panel has taken proposal 275/E to supersede 257/E.
   - early rifting in Manzanillo Rift
   - geochemical studies in Farallon Basin
   - hydrothermal systems in Guaymas Basin
   - Neogene paleoeanography and depositional history

This is an unwieldy proposal with 33 proponents, 27 sites, and over 11 km of proposed drilling. The mixed objectives make it very difficult for a single panel to review. Of particular interest to SOHP are the five sites proposed for paleoceanography. These sites should provide a high-resolution Quaternary paleoclimate signal though the need for such studies was questioned until Leg 64 work is completed. Also of interest are studies of diagenesis and metallogenesis though these studies are poorly defined and require high temperature drilling. SOHP potentially has strong interest in a Gulf of California program, but this proposal must be broken down into realistic manageable components.

8. California Current Transect (271/E)
   - history of California current (timing of initiation, spatial and temporal fluctuations in strength, and seasonality effects)
   - biostratigraphic, magnetostratigraphic and tephra-stratigraphic reference sections
   - high-resolution climatic cycles
   - nature and timing of deep-sea unconformities

   Scope of proposal is somewhat regional but objectives are extremely important in terms of global Neogene paleoenvironments theme. Not all sites critical, will be difficult to recover carbonate in some sites. Examination of onset of El-Nino is potentially very exciting.

9. Central California Coast (Monterey Fan) (212/E)
   - history of Monterey Fan
   - paleo trench location and history
   - history of Salinian Block
   - change from subduction to transform motion

   Of limited interest to SOHP. Proposal very immature. CEPAC representative reports proposal withdrawn.

10. California Transform Margin (245/E)
   - basement composition of suspect terranes
   - age and inception of strike-slip faulting
   - sedimentological and tectonic aspects of deep-sea fans

   Also of limited SOHP interest. Like Queen Charlotte Transform proposal, a difficult paleoceanographic problem to solve. Potential SOHP interest in diagenesis of diatomaceous sequences and unconformity dating but of more regional interest.

11. N. Gulf of Alaska (236/E)
- origin and movement of allochthonous terranes
- processes occurring at subduction zone

Well-documented proposal that is not directed towards SOHP interests but potentially important to SOHP if Sounder Ridge sites are not possible. N. Gulf of Alaska sites present possibility of recovering a high-latitude paleoclimatic reference section. Also, possible diagenesis and pore water studies in subducted sediments.

12. Oregon Accretionary Complex (233/E)
- delineation and quantification of fluid migration processes within an accretionary complex

Well-documented proposal with many tectonic objectives but a number of diagenetic and hydrogeologic objectives that are of interest to SOHP. Logging and in situ pore water sampling will be critical for this program. Of particular interest is diagenesis of authogenic carbonates. The SOHP wonders if these sites are not more appropriate for hydrogeology studies than Nankai.

13. Aleutian Subaerial Pyroclastic Flows (269/E)
- drill pyroclastic flows within 50 km of Aleutian Calderas to examine effects of submarine environment or physical characteristics of flow.

Very narrow focus and apparently inappropriate use of drillship. Could be studied with vibracoring and subaerially in recent uplifted deposits.

14. Navy Fan (250/E)
- evaluate applicability of commonly-used sedimentation models based on ancient turbidite systems to modern continental margin environments.
- effects of sea level changes on supply of sediment to Fan
- determine co-eval lithofacies associated with sub-environments of deposition (e.g. valley, overbank, lobe, etc.)
- late Pleistocene stratigraphy of S. Clemente Basin to provide constraints on tectonic and paleoceanographic history of borderland.

Fan drilling has been the subject of numerous discussions at the SOHP (see previous minutes). While some fan drilling addresses strictly regional problems, a carefully selected site and planned program can address questions important to SOHP global themes, in

particular the history of sea level and its role in generating continent margin and deep sea sedimentary sequences. Navy Fan, because it is young (hence thin deposits) somewhat isolated (thus relatively higher input of biogenic components) and closely analagous to many turbidite sequences preserved in the geologic record makes it the best candidate for fan drilling.

Having discussed or reviewed all proposals, the SOHP ranked these programs based on their relevance to existing themes or their potential relevance to themes that we have not yet addressed but should.

Thirty proposals were presented; the Escanaba Trough proposals (224 and 284), the Old Pacific proposals (261 and 285), and the Gulf of California proposals (257/275) were each treated as one program. Each member was given 15 votes of equal value and a vote taken in order to eliminate those proposals of limited interest to SOHP themes.

Using a cutoff valve of eight votes, seventeen proposals were eliminated (212, 224, 225, 229, 233, 237, 241, 245, 247, 249, 256, 261, 269, 236, 280, 282, 284).

Completing this exercise and now having a more manageable number of proposals to deal with, the SOHP re-examined its previously established Pacific themes to see how the remaining proposals fit within them and what revisions, if any, were necessary.

Within the framework of each theme, the proposals were ranked with respect to their relative merits and relevance to that theme:

(1) Theme: <u>Neogene Paleoenvironment</u>

Relevant Proposals:		Rank
221/E	Eq. Pacific Paleoenvironments	1
142/E	Ontong Java Transect	1
195/E	Bering Sea/Umnak	3
271/E	California Current Transect	4
199, 259/E	North Pacific Gyre & Meiji Drift	5
257, 275/E	Gulf of California	5

(2) Theme: Mesozoic Paleoceanography (2)

Relevant Proposals:		Rank
202, 203, 260	Atolls & Guyots (only those parts of each proposal dealing with sediment caps)	1
182, 195	Bering Sea	2
222	Ontong Java History	3
199	N. Pacific Gyre	3

(3) Theme: Sea Level: Atolls and Guyots (SLAG)

Relevant Proposals:		Rank
202	Marshall drowned atolls	1
260	Ogawawara Plateau	2
203	Pacific Guyots	3

(4) Theme: Anoxic Events

Relevant Proposals:		Rank
253	Shatsky Rise	1
275/257	Gulf of California	2
182	Bering Sea	3

(5) Theme: Old Pacific Crust

Relevant Proposals:		Rank
285	Jurassic Quiet Zone (replacing 261)	1

(6) Theme: Metalogenesis and Diagenesis

Relevant Proposals:		Rank
233	Oregon Accretionary Margin	1
284/224	Escanaba Trough	2
275/257	Gulf of California	3

(7) Theme: Fans and Sedimentary Processes

Relevant Proposals:		Rank
250	Navy Fan	1
271	California Current	2
275	Gulf of California	3

The interest in the metallogenesis and diagenetic aspects of the Gulf of California proposal led to the discussion of the SOHP's attitude toward these issues. Once again we concluded that we would like to see a separate working group dealing with geochemical problems, but in the absence of such a group we cannot overlook these topics and include a seventh theme.

Each of these themes represents problems of key importance to the SOHP, and we would like to see all of them addressed in the course of Pacific Drilling. While we realize that this may not be possible, we believe that at this point in the CEPAC planning process, the themes we have presented along with the highest ranked proposals associated with them make up a viable starting point for CEPAC planning. Despite the large number of individual proposals represented in this list, logistical constraints, lack of adequate documentation, and the combination of proposals into logical packages will all serve to reduce the number of legs to a manageable level.

In forthcoming meetings SOHP, along with CEPAC will begin to select the highest priority aspects of the thematically-relevant proposals and begin to establish viable drilling packages.

10. Next meeting: 7, 8, 9 March in Houston, Texas.
André Droxler, Rice University, Host.

Liaisons for upcoming meetings:

André Schaaf will go to CEPAC meeting in Paris.
Phil Meyers will go to SOP meeting in Ohio.
Isabella Premoli Silva will go to IOP meeting in Rome.

11. SOHP Discussion of ODP Planning Process:

We have seen on the SOHP over the past few years, an evolution of thought about the effectiveness of the present planning structure, beginning with total dissatisfaction in late 1985 (as evidenced by the Panel's unanimous endorsement of the Arthur/Leinen memo) to a position of general acceptance but far from enthusiastic support for the present scheme. Our feelings of frustration (that we were just 'spinning wheels') have been replaced (since the first PANCHM meeting and PCOM's guidelines with regard to planning flow and liaisons) with the uneasy feeling that the system appears to be working now, but can it continue to do so?

We believe that the fundamental problem facing the planning process has been the lack of a clear cut hierarchy between

the thematic and regional panels. It may sound glib coming from a thematic panel, but there can be no question that drilling must be thematically driven. Both COSOD I and II, in defining the fundamental questions to be addressed by scientific ocean drilling, have specified problems that are process or theme oriented rather than regional in nature. Once thematic objectives are defined, the specifics of site location must be addressed by the regional experts, but this must be done within the framework of the thematic objectives. In creating a non-hierarchial system, PCOM has generated a planning process that at its worst is a competitive free-for-all between regional and thematic objectives (with PCOM as the arbitrator) and, at its best, approaches the hierachial system that we are requesting. We have seen that the system can work well, but only when everyone is reasonable and the liaisons are excellent. We are too cynical to expect that this will always be the case and would much rather see PCOM formalize a planning process that ensures a thematically driven program.

We believe that the role of the thematic panels should be to develop long-term, global (if necessary--most of SOHP's goals are) programs in response to meetings like COSOD I and II. These thematic aims should be debated and hopefully approved by PCOM and then become the basis for long-term logistical planning. SOHP has attempted this in the past with projects like the deep tests or the paleoupwelling program which called for a series of globally distributed sites, but the thematic ramifications of such programs and particularly the importance of 'the package' in terms of addressing the objectives seemed to never filter through the system. If such themes were PCOM directives, we believe that they would.

This call for formal recognition of major themes is not an effort to divert from a proposal-driven program. If ODP is to remain an open organization, we must always be receptive and responsive to proposals from the community. What we seek, is a compromise between a proposal-driven program and the coherent, long-term planning that can be achieved with a limited number of major themes. Perhaps this compromise could be called a 'proposal-responsive' system in which we operate under major thematic objectives (developed at forums like COSOD other workshops) and respond to individual proposals.

The mandate of the SOHP: We have long considered our mandate to be too broad and have supported several proposals for partitioning our duties. One possibility is to establish a series of working groups that are watchdogs for particular subdisciplines (i.e. physical properties, organic chemistry, etc.). These working groups would review all drilling prospectuses and evaluate the specific needs of particular legs for their subdiscipline. These working

groups may also want to solicit or submit specific proposals for areas of critical interest.

We are also concerned with the recent change to two meetings per year coupled with a rotation of one-third of the membership off each year. This has led to severe problems of continuity and much wasted time and duplicated effort (we have at least three new members every other meeting). Therefore, we ask PCOM in considering a new planning structure to attempt to design a system that provides for some long-term stability.

APPENDIX A

9.3 CEPAC:

The third day of the SOHP meeting was devoted entirely to discussions of CEPAC objectives and priorities. The discussion began with a review of SOHP's previously (and hastily) established themes for CEPAC drilling:

1 -PALEOSECS (high-to-low-latitude and depth transects)
2 -Old Pacific Crust
3 -Atolls and Guyots
4 -Episodicity of Volcanism
5 -Fans and Sedimentary Processes
6 -Fluid Circulation (hydrothermal processes, etc.)

It was apparent that some of these themes -- especially the top priority PALEOSECS theme -- were too broad and unfocussed to provide useful direction to the CEPAC Panel. A rather free-form discussion ensued with numerous Pacific-specific problems outlined. These included:

- silica uptake and deposition in the N. Pacific
- CCD history of the N. Pacific
- Gateways: Bering Sea, Atlantic and Indian Ocean connections
- organic matter - upwelling history
- evolution of biota in Pacific and relationship to in-place high latitude fauna
- low latitude temperature and bottom water history
- Eastern boundary currents and relationship to terrestrial climate

In order to focus our discussion, Bill Sliter was asked to present the CEPAC Panel's preliminary packages and ranking. We would respond to this, note any important gaps and oversights and then use this as a guide to formulate more focussed themes.

The CEPAC preliminary prospectus consisted of:

		CEPAC Rank
1)	Juan de Fuca (232 E)	3
2)	N. Pacific Gyre (199E)	2
3)	Pacific Guyots (203E)	1
4)	Ontong Java Plateau (222E)	2
5)	EPR (76E)	3
6)	Bering Sea (195E)	5
7)	Shatsky (253E)	2
8)	Marshalls (202E)	1
9)	Old Pacific (262E)	4
10)	Oregon Accretionary Prism (233E)	8

11)	N P Magnetic Quiet Zone (231E)	2
12)	Ontong Java Transect (142E)	2
13)	Hawaii Moat (31E)	6
14)	Vancouver Island (237E)	0

Those of direct SOHP interest are:

1) N. Pacific Gyre
2) Ontong Java Plateau
3) Bering Sea
4) Shatsky
5) Marshalls
6) Old Pacific

Of some interest are:

7) Pacific Guyots
8) Juan de Fuca
9) Oregon Accretionary Prism

The programs of interest to SOHP and included on the CEPAC program were discussed:

1. N. Pacific Gyre (199E)
   - evolution of siliceous sedimentation in N. Pacific
   - relationship to Antarctic glaciation (global silica budget)
   - Cenozoic history of aeolian sedimentation
   - paleoenvironment of N. Pacific - Milankovitch cycles over Neogene interval of global cooling
   - evolution/paleobiology of subarctic gyre species

   The SOHP wonders if many of these questions can be addresses in Bering Sea. In many cases, sites further North would better address objectives (i.e. Sounder Ridge). Could any of these objectives be combined with NP MQZ program?

2. O. J. Plateau (depth transect) (142E)
   - vertical oceanic gradients and their linkage to climate parameters, bottom and intermediate water properties
   - high-resolution stratigraphic records across intervals of fundamental paleoceanographic change (global hiatuses)
   - nature and role of carbonate dissolution - CO_2 budgets
   - nature of deep-sea seismic signal and relationship to sea level signal
   - correlation with margin transects (basin-shelf fractionation) and global network of equatorial depth transects (basin-basin fractionation)

The SOHP strongly supports this program though they would like to see the proposal better documented. This program is very complementary to Eq Pacific Paleoenviroment program (221E) - see below.

3. Bering Sea (182E, 195E)
   - one of few sites available for Cretaceous-Paleogene high northern latitude pelagic record
   - water mass exchanges with Arctic Ocean through time
   - areal extent of Cretaceous black shales
   - nature of Cretaceous-Paleogene high latitude climate
   - evolution of faunal assemblages - radiation of species

   The SOHP supports these programs and has listed the Sounder Ridge as one of its highest priority Deep Stratigraphic Test sites. Our only concern is uncertainty of basement ages in region.

4. Shatsky
   - anoxic history in low latitude ocean basin
   - history of productivity, upwelling, volcanism
   - paleodepth of low oxygen water masses
   - paleomag studies, spreading rates, plate evolution
   - transitional ocean (early Jurassic) - major climate change

   The SOHP strongly supports this program. Problem is technical one. Must be able to drill through mixed lithologies to address objectives.

5. Marshalls and Pacific Guyots:
   - Eocene-Cretaceous (?) reefs
   - volcanic history
   - subsidence patterns and sea level history
   - why atoll vs guyot
   - plate motions

   The Panel believes that atoll and guyot drilling can be extremely important to SOHP objectives, particularly in terms of establishing sea level histories, in establishing continuous paleoclimatic record (pre Neogene) from low latitude (must be pieced together), examining diagenesis as a function of sea level fluctuations, volcanic episodicity and early Cretaceous to Recent shallow water biota. To address these problems, we urge that the sites drilled be:

   - continuous pelagic sequences
   - above CCD
   - not too deeply buried

Examples: Harrie, Sylvania, Horizon, Ogasawara

6. Old Pacific Crust (261E)
   - age and nature of Mid Cretaceous volcanic crust
   - age and paleoenvironment of underlying (Jurassic-E. Cretaceous) sediment
   - calibration of Mesozoic magnetic lineation correlation

   This program offers the only opportunity to look at an open ocean record for the Cretaceous and thus is of extreme importance to the SOHP. The success of this program depends on site surveys that show windows through the volcanic event and a drillstring capable of withstanding severe conditions imposed by the program.

The following gaps in the CEPAC program were identified and discussed:

1 Equatorial Pacific Late Paleoenvironments (221E)
   - focuses on equatorial current system and relationship to thermocline
   - examines several time scales - Milankovitch cycles and Neogene events
   - addresses questions of dissolution vs erosion vs productivity and relevance to global hiatuses, Isthmus of Panama closing
   - excellent complement to Peru Margin studies and O.J. Plateau transect (deep and intermediate water story)

   Strong SOHP support for this program.

2 Ogasawara Plateau (260D)
   - comparisons between guyot and seamount development
   - development stages of reefal communities (Jurassic? - Cretaceous)
   - diagenesis studies
   - Paleogene carbonate sequences

   General support but some questions of appropriateness of sites - section is thin.

3 Peru Margin - B. Garrison suggested a return to Peru Margin - problems to be addressed include:
   - upwelling history - longer than thought-land evidence shows Oligocene/Eocene events
   - Milankovitch/phosphorite cycles
   - brine story - implications for diagenesisSOHP very enthused about Leg 112 results and not opposed to further drilling but feels that it is necessary for Leg 112 results to have

public dissemination and for land studies to develop further before more serious consideration.

4 Gulf of California (257E)
- Cenozoic sediments and diagenesis with respect to heat flows

Guaymus Basin already examined (Site 498). Regional studies are necessary before further drilling. Problem might be better examined at Juan de Fuca Ridge.

5 California Margin Transects
- history of California Current system
- timing of onset of diatom deposition
- development of seasonality
- response of current system to N. hemisphere glaciation
- hiatus development
- improved paleomag and tephrachronology

Can be combined with tectonic (248E) and Navy Fan proposals. Potentially serious problems with paleomag. General support but needs careful identification of useful sites.

6 South Pacific
- South Pacific is important in terms of high latitude paleoceanography and as comparison to N. Pacific high latitude sites. We encourage proposals especially for pre-Neogene sections (Louisville Ridge?)

7 N.E. Pacific upwelling (247E)
- high latitude reference biostratigraphic studies
- paleoceanography of California Current
- N. Pacific bottom water history
- long term hydrothermal history
- history of aeolian sediments and hemipelagic deposition
- age, composition, history of seamount chains

This program is certainly relevant to SOHP interests but needs to be better focused and developed to demonstrate feasibility of fulfilling objectives.

8 Fans and Sedimentary Processes
- find modern analogs to important ancient deposits
- test models for fan development

- relationship of turbidite deposition to tectonic and sea level history

SOHP is generally supportive of efforts to see problems of fans addressed. Some technical difficulties exist and some debate among proponents about which fan is best to drill. A careful drilling strategy must be developed.

Based on these discussions, SOHP ranked all discussed programs:

Rank	Votes	Theme
1	12	Equatorial Pacific
2	11	Bering Sea
3	10	Old Pacific
4	9	Ontong Java Plateau (Transect)
5	8	Shatsky Rise
6	7	Navy Fan
7	5	N. Pacific Gyre
8	4	Gulf of California (diagenesis)
	4	Oregon upwelling
10	3	Marshalls (atolls)
	3	California margin transect
	3	Ogasawara (seamount)
	3	Louisville Ridge (SW Pacific)
14	2	Pacific guyots
	2	Peru margin (oceanography)
16	1	Juan de Fuca (sedimented ridge)
	1	Oregon accretionary prism
	1	S. Pacific

And established a set of CEPAC-specific themes to guide future CEPAC planning (in order of priority)

1. <u>Pacific Neogene Paleoenvironment:</u>
   High resolution surface and bottom water Neogene history of the Pacific and its relationship to paleoclimate, sea level, and tectonic events -
   Example programs: - Eq Pacific Paleoenvironments (221E); O.J. Depth Transect (142E)

2. <u>Mesozoic-Paleogene Pacific Paleoceanography:</u>
   Evolution of late Mesozoic through Paleogene paleoclimates in high and low latitudes -
   Example programs: - Sounder Ridge-Unmak Plateau (195E, 182E); Atolls (some N. Pacific Gyre sites)

3. <u>Old Pacific Crust:</u>
   A look at Cretaceous open ocean
   Example program: - Mariana/Nauru Basin (261E)

4. Anoxic events:
   Time stratigraphy, distribution and significance of oceanic carbon in low latitude open ocean settings. Correlation with other Cretaceous anoxic events, role of black shales in global carbon cycles; importance of carbon preservation vs productivity; effect of volcanism and role of bathymetry and climate in developing upwelling.
   Example program: - Shatsky Rise (253E)

5. Atolls and Guyots:
   Drowning history, sea level and subsidence curves; continuous pre-Neogene paleoclimatic record from low latitudes; early Cretaceous to Recent shallow water biota; diagenesis as function of seal level history and volcanic episodicity.
   Example program: - (Ogasawara (260D), Marshalls, Pacific Guyots, 202E, 203E)

6. Fans and Sedimentary Processes:
   Modern analogs to ancient deposits; test models for fan development; relationship of turbidite deposition to tectonic and sea level history.
   Example programs: - Navy Fan (250E), Zodiak Fan (241E), Monterey Fan

The rationale for this ranking can be found in the discussions of individual programs. The SOHP emphasizes that these are its highest ranked themes for CEPAC drilling and that we would like to see each of these issues addressed in the Pacific. We are very concerned about the time constraints placed on the Pacific program and ask PCOM to seriously consider the time allotted to Pacific drilling.

APPENDIX B

SOHP postion in MVT drilling in N.E. Australia:

There is a reasonable geologic analogy between interpreted depositional environments of host beds of Mississippi Valley Type (MVT) Pb/Zn deposits of the southeast Missouri district and sediments of the northeast Coast of Australia. Both are characterized by fore reef, reef, and back reef carbonate facies as well as coarse clastic (potential aquifer) units. Both are adjacent to sedimentary basins which could represent the source of compaction driven ore forming fluids. There is, however, considerable reason to suspect that factors other than normal digenetic evolution and fluid drive other than that expected from basin compaction are required to explain the origin of the Missouri MVT deposits. Recent fluid inclusion studies on regional distribution of salinity and filling temperatures in the mid-continent area, including data from N. Arkansas, Missouri, Kansas, and Oklahoma demonstrates a regional thermal event which was the cause of the precipitation of ubiquitous hydrothermal dolomite and trace sphalerite so characteristic of this area. This event heated the entire sedimentary section including late Cambrian to Pennsylvanian units to temperatures far above what they would have experienced based solely on their maximum burial depth. Much of the mid-continent region of the U.S. was bathed in warm and very saline fluids. Published calculations based on numerical modeling of regional fluid flow show that regional heating of this magnitude cannot be caused by fluids derived from compacting sedimentary basins, but instead requires heat transport only attainable in flow regimes driven by hydrostatic head differences. This constraint, coupled with the sketchy information on the timing of Pb/Zn mineralization, dating it as late Pennsylvanian or early Permian, suggests that the ores are related to continental scale tectonic events occurring at that time involving the assembling of the super continent Pangea. The measured fluid inclusion filling temperatures are consistent with this interpretation in that they increase systematically to the south towards the Arkoma Basin and Ouachita orogenic zone.

Even if local early diagenetic factors may not be ultimately responsible for MVT mineralization, early diagenesis nevertheless probably plays an important role in "host rock preparation" events such as defining porosity of potential aquifer units, and localized formation of H_2S in reef units. This H_2S might later act as trap for metals. Thus although we do not feel that the MVT - NE Australia analogy is sufficiently strong to resite the proposed ODP drilling which has already been designed to address a range of other geologic issues, there is strong motivation to make a concerted effort to obtain geochemical and diagenetic information relevant to MVT deposit formation on the planned holes. Before such measurements are planned, however, careful attention must be paid to the existing and planned ODP capabilities and the time associated with such measurements. It is also suggested that the Florida Escarpment may be a more suitable place for this experiment.

JOIDES Tectonics Panel Meeting
Celerina, Switzerland
27-28 September 1987

Panel members present:	Darrel Cowan (USA), Chairman Ian Dalziel (USA) Dan Davis (USA) Karl Hinz (FRG) David Howell (USA) Ken Hsü (ESF) Robin Riddihough (Canada) François Roure (France) Peter Vogt (USA) Tony Watts (USA) Graham Westbrook (UK)
In attendance:	Olav Eldholm (PCOM) Greg Moore (WPAC) Jean-Claude Sibuet (ARP) Dave Scholl (CEPAC) Kensaku Tamaki (temporary replacement for Nakamura)
Members absent:	Bruce Marsh (USA)

AGENDA

1. Minutes of previous meeting
2. Reports from liaisons (I)
3. Central and Eastern Pacific
4. Reports from liasons (II)
5. Western Pacific
6. Membership changes
7. Next meeting

EXECUTIVE SUMMARY
TECTONICS PANEL MEETING
27-28 September 1987
Celerina, Switzerland

1. CENTRAL & EASTERN PACIFIC

TECP establishes three prioritized groups of themes (programs).

(A) Highest priority; clearly supported by a majority of the panel at this mee

- M-series dating and calibration of anomalies in old crust
- Flexure of oceanic lithosphere
- Ridge-trench interactions
- Pre-70 Ma absolute motion
- Deformation in accretionary prisms

(B) Intermediate priority; some can be addressed in combination with other programs

- Cretaceous quiet zone
- Cretaceous intraplate volcanism
- Comparative geochemistry of arc magmas and descending crust
- Rates of deformation at the toe of accretionary prisms
- Cenozoic absolute motion
- Subsidence history and sea-level changes

(C) Distinctly lowest priority; little support at this meeting

- Absolute subduction rate
- Gulf of California
- Oceanic plateaus
- Structures in oceanic crust

2. WESTERN PACIFIC

(A) BONIN - MARIANAS: TECP recommends drilling two holes on Conical Seamount in the Marianas (~ site MAR - 3) to study the fabric, fluid regime, and history of an active serpentinite diapir. We assign a lower priority to drilling one hole at BON - 7, largely because the origin of the seamount there is obscure.

(B) NANKAI: We support the general themes of fluid flow and compositions in accretionary prisms and forearcs. There is as yet no formal proposal addressing these problems at Nankai, but we will review such a proposal, if one is submitted, and compare it to 233/E (fluids in Cascadia prism).

(C) LAU BASIN: Because there are so many unresolved questions about the spreading history in the Lau basin, we are not able to discern how proposed backarc drilling will solve general or specific tectonic problems related to backarc-arc evolution. LG - 3 and 6 will help establish the nature of basement in the arc and forearc, but a more extensive, multi-site drilling program is probably required to get at fundamental tectonic problems.

(D) SUNDA: Our position regarding this program hasn't changed. We recognize that collision-related processes are important, but are unsure of the best drilling strategy. We still have doubts that the information that would be provided by the Sunda drilling program, in its present form or even if supported by new geophysical data, will uniquely resolve fundamental questions about arc-continent collisions.

(E) S. CHINA SEA: Our interest in some form of drilling program on the margins of the S. China Sea -- to address the early rifting and subsidence history of a marginal basin formed by rifting near the edge of a continent -- is growing. We would like to be presented with a revised proposal that is more regional in scope and more attentive to alternative models for extension and how they would be tested by drilling.

MINUTES

SUNDAY, 27 SEPTEMBER
The meeting began at 0830
Cowan welcomed Olav Eldholm, one of our liasons from PCOM, and Kensaku Tamaki, who is temporarily Japan's representative, replacing Kazuaki Nakamura. Robin Riddihough generously volunteered to serve as Secretary during the meeting.

1. MINUTES OF THE PREVIOUS MEETING

Graham Westbrook noted that, in section 4.2.1., "basin" should read "basic." With this change the minutes were approved.

2. REPORTS FROM LIASONS (I)

Cowan asked for reports form PCOM and CEPAC first, so that the panel would begin and complete its discussion of the C. and E. Pacific the first day. Dave Scholl will travel to Paris the next day to present the results at CEPAC.

2.1 PCOM

Eldholm reviewed some retrenchments in the publications budget, particularly as they affect Part B of the leg reports. PCOM approved a deep (300m) basement hole in the Argo abyssal plain. Regarding the W. Pacific, PCOM chose 9 programs from the WPAC prospectus of 12; these 9 would require about 12 legs. SSP has already pointed out potential deficiencies in site surveys; PCOM anticipates jurisdictional problems. PCOM has asked thematic panels for input [requests to TECP were detailed on the second day of the meeting]. A suggested program for Fiscal Year (FY) 1989 -- the final program will be approved at the December PCOM meeting -- comprises: (1) Banda-Sulu-S. China Sea; (2) Bonin 1; (3) Bonin 2; (4) Nankai; (5) Japan Sea 1; (b) Japan Sea 2. Some of these programs constitute only part of a leg. At its December meeting, PCOM also needs to identify technical/engineering needs and expenditures for FY 89 drilling.

Regarding the C. & E. Pacific, PCOM expects to consider a final prospectus from CEPAC at its Spring meeting. PCOM has specifically asked TECP to provide its six most highly ranked programs, and somehow to group existing proposals within them [more details were provided by Eldholm and Cowan later in the meeting].

Eldholm then summarized PCOM's desire to achieve a stronger thematic input to the planning process -- to achieve a more thematically driven program. Toward this end, PCOM has established a sub-committee to review the panel structure; meanwhile, it adopted an interim "proposal review process," encapsulated in a form which Cowan distributed to all present. A long discussion ensued, and Cowan offerred to bring before the upcoming Panel Chairmen's meeting some of the points raised. Howell was concerned that a short "keyword" evaluation on the form would be too brief. Hsü wondered how to deal with proposals that rank "medium" in two or more thematic panels, but that might in reality be strengthened because of broad-based support. Hsü and Scholl suggested adding some sort of "multi-thematic" rating to the form. Vogt wondered about the fate of topics and areas that are not addressed by

proposals. Eldholm encouraged the thematic panels to be alert for these and flag them somehow. Vogt also requested that copies of white papers from thematic panels be made available to proponents.Watts asked if PCOM had considered how to coordinate a response to a proposal using the form with panel meetings. Eldholm encouraged the panels to provide feedback to PCOM concerning the new system.

2.2 CEPAC

Scholl mentioned that CEPAC hadn't met since our last meeting, and he emphasized again the importance of thematic input from TECP at this juncture. CEPAC has received several new proposals since they last met, and their upcoming meeting in Paris is being held jointly with LITHP.

3. CENTRAL & EASTERN PACIFIC

Eldholm and Cowan reiterated the instructions from PCOM: to provide a group of our most highly ranked six programs. Cowan distributed a list of the thematic issues identified in the TECP White Paper; each topic was followed by the number of the relevant proposals. He asked the panel to identify the top-priority programs, and to provide specific comments on the scientific content of as many of the proposals as possible.

Hsü then asked whether the numbers of legs in both W. and C. & E. Pacific were fixed at 9 (i.e., 1 1/2 years drilling in each region). Eldholm replied that PCOM is in principle no longer committed to a second circum-navigation; in fact, holes in a particular area can be staggered over time, rather than be drilled all in one leg. Moreover, the "9-leg" scenarios are for "planning purposes." They may change depending on thematic priorities, technological progress, and the like.

The following summary is organized by thematic problems, in the order in which they were discussed by TECP.

3.1 PLATE KINEMATICS

3.1.1 Absolute rate of subduction

No proposals have been submitted for this topic, so TECP postponed discussion.

3.1.2 Dating and calibration of anomalies in old oceanic crust

Relevant proposals: 261E, 285/E, 287/E

After Vogt briefly reviewed the content of his proposals (285/E and 287/E), there was an early consensus, summarized by Hsü, that dating the M-series anomalies is an important goal; the Jurassic history of part of the Pacific basin is a fundamental, but only partly resolved, problem. Further discussion focused on the merits of the three proposals, and particularly on 261/E. Although 261/E is designed to sample both Jurassic crust and overlying Cretaceous basalt, there was general concern that the Cretaceous flows may be too thick to guarantee

penetration of older crust. Cowan noted that there are really two different themes addressed by 261/E: old (Jurassic) crust, and Cretaceous intraplate volcanism. Several panel members emphasized the importance of the latter. There are unresolved questions about the origin of these volcanics; how widespread this and similar events (e.g. in the Venezuelan Basin) were, and why; and the duration of the Pacific event. Systematic drilling to address these problems in the Pacific is a worthwhile objective, but TECP would like to see more information (i.e. more geophysics) to place such a proposed drilling program in a better understood regional context.

In summary, TECP reaffirms its interest in a drilling program in Jurassic crust, as proposed in 285/E and 287/E. It also recognizes that the nature and origin of Pacific Cretaceous intraplate volcanism are fundamental problems, deserving of a systematic drilling program based on extensive geophysical data. 261/E alone addresses neither problem satisfactorily. It should be revised as a wholly "intraplate volcanism" proposal.

3.1.3 Cretaceous quiet zone

Relevant proposal: 231/E

Scholl emphasized how the resolution of conflicting models for the evolution of the N.Pacific awaits better dating of crust in the quiet zone. TECP recognized that this proposal and theme address not so much a process as a regional kinematic problem with probable wider significance for events along the plate margins. The distinction among the models, and exactly how the models will be tested by drilling, need to be explained more fully in a revised 231/E.

3.1.4 Hotspot traces and absolute plate motions

Relevant proposals: 202/E, 203/E, 247/E, 280/E, 282/E, 283/E

In a general discussion of this theme and these proposals, TECP recognized that three separate issues were actually involved: (1) pre-70 Ma absolute motions (280/E; 203/E); (2) post-70 Ma absolute motions (247/E, 282/E, 283/E); and (3) subsidence history and sea-level changes (202/E, 203/E). Proposal 280/E is specifically designed to document the age progression of mid-Cretaceous Geisha seamounts. The only criticism offered was the question of whether these seamounts actually define a trend.

282/E is designed to address the post-bend motion of the Hawaiian hot-spot. The general goal of testing whether there are short-term variations in plate motion is important, but TECP felt that the 282/E program would be unlikely to achieve the expected resolution of ages to an accuracy of < 2 m.y. 247/E is of only marginal interest with regard to

this theme, because penetration of basement is not a prime objective. 283/E is only incidentally designed to address tectonic questions. TECP questions the principle of using sedimentary facies to address tectonic questions as proposed by 283/E; the resolving power of expected facies is too small.

202/E and 203/E primarily address a tectonic problem that was not included in the TECP White Paper: sea-level changes and the subsidence history of oceanic crust. Opinions were expressed about whether the best information concerning sea-level change will come from continental margins or islands. A general concern is whether we can establish the age of sediments on the banks and islands to an accuracy of 5 m.y. or less in the Cretaceous. Even this resolution, however, may be useful in some analyses of subsidence history. Dolomitization of sediments is a problem that could potentially interfere with establishing the age of sediments and the depth at which they were deposited. In summary, TECP is concerned that the resolution of ages and the depth indicators that will be provided by the drilling proposed in 202/E and 203/E may prove to be too crude to satisfactorily address tectonic problems. These proposals fall largely in the realm of SOHP.

3.2 COMPARATIVE GEOCHEMISTRY OF ARC MAGMAS AND DESCENDING CRUST

Relevant proposals: 285/E, 287/E (both contribute to the topic)

There are yet no proposals in the CEPAC list that deal primarily with this high-priority thematic issue. If holes are drilled as proposed in 285/E and 287/E, some useful data on the geochemistry of old crust could be obtained. Eldholm said that PCOM recognizes the need for a drilling strategy that will satisfactorily address the problem. BON-8 (deep reference hole) is a case in point; it will certainly provide geochemical data on the crust, but the relevance of these data from just one site to arc magmatism isn't totally clear. Points brought out in TECP discussion included: how to deal with the "time-delay" problem (crust descending now may not be representative of what has contributed to magmas; the need for a very well-understood kinematic context, how crust has been moving relative to the arc during magmatic periods in question).

The consensus of TECP is still that a concerted program of several holes in front of a well-studied arc will be more useful than "sites of opportunity" that are basically designed to penetrate deeply into oceanic crust. TECP concluded that such a custom-designed proposal should be solicited, although the mechanisms for such a solicitation aren't clear.

3.3 RIDGE-TRENCH INTERACTIONS

Relevant proposal: 8/E

TECP still is interested in a drilling program at and near the intersection of the Chile rise and Chile trench. The thermal history of ridge-trench interactions and attendant vertical displacements are topically of great interest (see TECP White Paper). We understand that further site surveying will be undertaken soon, so we expect that 8/E, which has been on the books for some time, will be updated and revised. TECP will postpone further review of 8/E until the new data (and proposal) are available.

3.4 DEFORMATION WITHIN ACCRETIONARY PRISMS

Relevant proposals: 37/E, 233/E, 237/E, 277/E

Cowan briefly summarized the existing proposals and noted that TECP identified deep drilling in a clastic-dominated prism as a high-priority theme in our White Paper. CEPAC has included both deep drilling (237/E) and a suite of shallow, fluid-oriented holes (233/E) in their Cascadia program. A new proposal (277/E) nominally addresses the question of aseismic vs. seismic slip on the Cascadia decollement.

Several specific criticisms of 277/E were offered. Although the tiltmeter to measure deformation is to be placed in a prominent fold upslope from the toe of the accretionary prism, this particular structure may not be actively growing if slip (aseismic or seismic) is transferred oceanward along a decollement to other structures at the actual deformation front. In other words, a negative result -- no measurable deformation of the major fold during the monitoring period -- may not indicate "locked" behavior. It would be difficult in principle to pinpoint the active structures with seismic profiles, especially if they are very recent. Also, it was felt that more reflection coverage of the area is needed to put the proposed sites into a proper regional context. The basic problem posed -- slip behavior and consequent seismic risk -- is a good one, but the proposal seems more suited to address another separate issue which we can identify as a new theme: deformation rates at the leading edge of an accretionary prism. TECP agreed that this problem is also important, but felt that 277/E should be modified to include a wider net of instruments placed in a more tightly constrained structural framework.

We then discussed the Cascadia drilling program in general as encompassed by 233/E and 237/E. A question repeatedly raised was whether deep Cascadia drilling off Vancouver Island would be advisable or valuable if drilling at Nankai -- NKT-1 and 2, and geotechnical -- were successful. The need for subdecollement drilling, to establish fluid compositions and processes, temperatures, and the like, is clear; the debate concerns how many holes are needed, to what depth, and whether both Nankai and Cascadia need be drilled. The panel seemed split on the latter issue, it didn't reach a consensus. [Shallow "hydrogeologic" drilling at Nankai was discussed the following day].

3.5 FLEXURE OF OCEANIC LITHOSPEHERE

Relevant proposal: 3/E

Watts said that he had written LITHP addressing their concerns about the suitability of the sediments for biostratigraphic dating. TECP discussed the issue at its last meeting, but didn't receive a copy of Watt's letter. Watts further noted that a high-resolution site survey, with close line spacing, will take place soon.

3.6 OCEANIC PLATEAUS

Relevant proposal: 222/E + addendum

In the addendum, site 6, originally a "collisional" objective, is dropped, and sites 1 and 2 are proposed to be deepened to sample basement of the Ontong-Java plateau. TECP reiterated the same criticisms it raised in its White Paper: there are as yet not enough geophysical data to locate the most advantageous sites for drilling, or to interpret drilling results even if they become available. Extensive multichannel seismic, and perhaps aeromagnetic data, are needed. Sites 1 and 2 have some value as reconnaissance holes.

TECP recognizes that the origin of plateaus is a good problem, and would like to encourage further proposals based on more extensive geophysics.

3.7 STRUCTURES IN OCEANIC CRUST

Relevant proposals: 224/E, 278/E

These proposals were brought up for discussion because the general theme was included in the TECP White Paper, where it was rated "immature." The panel concluded these proposals should be properly evaluated by LITHP.

3.8 GULF OF CALIFORNIA

Relevant proposal: 275/E

Although not strictly a "theme," the drilling in the G of C proposed in the omnibus 275/E constitutes a program. This proposal was first considered by TECP at this meeting. The panel criticized several aspects of 275/E and the program in general. The Manzanillo rift program is ill-conceived; geophysical data presented in support of drilling are of poor quality; the relevance of the drilling or the rift itself to the origin of the Gulf or of rifted margins in general is not substantiated. By far the bulk of the proposed drilling would address petrologic and geochemical processes in active rifts, and the history of sedimentation within them. TECP didn't identify any specific or general tectonic

problems that would be addressed by sites in 275/E. Some useful information about subsidence would probably be obtained, if data from earlier drilling on Legs 64 and 65 were worked up, but this possibility wasn't raised in 275/E. The consensus of TECP was that the G of C is not a good analog for early stages of rifiting of classic passive margins; rather, it is in a separate class and may serve as an example of a "transform-rift" marked by long stretches of transforms and small pull-apart basins.

After completing its review of major thematic issues, TECP discussed how best to present its prioritized grouping or ranking of these issues, or "programs," to PCOM and CEPAC. The panel decided to vote on all of the thematic issues raised during the preceding, day-long discussion; some issues were newly identified and were not singled out in the White Paper. TECP decided not to rank-order individual proposals, but rather hoped that its discussion of their scientific merit as summarized in these minutes would constitute a useful review. The voting procedure adopted was to allow each panel member to list up to six of his most highly ranked themes.

MONDAY, 28 SEPTEMBER

TECP began its second day with a lengthy discussion of how to report the results of its vote. Opinion was divided on whether to report the actual votes, or rather just two or three groups of issues.

TECP MOTION: Thematic issues (programs) are to be reported in three groups: a top-ranked group of five; followed by an intermediate group of 6; followed by the lowest group of four, which had either no support (votes) or was supported by only one panel member
MOVED: Hsü
SECONDED: Westbrook
10 in favor
1 against
1 abstain MOTION PASSED

The groups, and relevant proposals, are:

(I) HIGHEST PRIORITY, CLEARLY SUPPORTED BY A MAJORITY OF THE PANEL AT THIS MEETING:

- M-series dating and calibration of anomalies in old oceanic crust 285/E, 287/E, 261/E (partial)
  Comments: see criticisms of 261/E above under 3.1.2
- Flexure of oceanic lithosphere
  3/E
- Ridge-trench interactions
  8/E
- Pre-70 Ma absolute motion
  280/E, 203/E (partial)
  Comments: see remarks about 203/E above under 3.1.4
- Deformation in accretionary prisms
  37/E, 233/E, 237/E

Comments: topic broadened from White paper to include shallow, in addition to deep, drilling; deformation-rate program appears below.

(II) INTERMEDIATE PRIORITY; some of these topics can be secondarily addressed in combination with other programs; lower priority may partly reflect deficiencies in existing proposals or lack of proposals

- Cretaceous quiet-zone
  231/E
- Cretaceous intra-plate volcanism
  261/E (partial)
- Comparative geochemistry of arc magmas and descending crust
  285/E, 287/E (contributing)
- Rates of deformation at the toe of accretionary prisms
  277/E
- Cenozoic absolute motion
  247/E, 282/E, 283/E
- Subsidence history and sea-level changes
  202/E, 203/E (partial)

(III) DISTINCTLY LOWEST PRIORITY; LITTLE SUPPORT AT THIS MEETING

- Absolute subduction rate
  No proposals
- Gulf of California
  275/E
- Oceanic plateaus
  222/E + addendum
- Structures in oceanic crust
  278/E

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4. REPORTS FROM LIAISONS (II)

4.1 WPAC

Moore and Tamaki noted that WPAC hadn't met since the last TECP meeting. Tamaki said that some new proposals for drilling on Zenisu Ridge, in Sea of Japan, and concerning ^{10}Be near the Japanese Islands, had recently been submitted.

4.2 ARP

Jean-Claude Sibuet reported that ARP is trying to develop many drilling programs and targets well in advance of the ship's next visit to the Atlantic. One in a series of workshops devoted to this development has already been held; future workshops concern the Caribbean, Mediterranean, central Atlantic, and Arctic. A white paper is also planned. Hinz emphasized the necessity to

explore different types of rifted margins, characterized by the presence or absence of volcanics; many of the targets are very deep. Watts noted that segmentation of margins is a major theme which he hopes will be highlighted in the white paper.

Hsü asked the important question about whether TECP should soon begin weighing the merits of diverse drilling programs in the Atlantic and circum-Atlantic basins against those of staying in the Pacific. Cowan encouraged the panel to adopt a long-term, global perspective. Eldholm again noted that a second circum-navigation is not obligatory; concern about transit time should not predominate over scientific questions, and the ship could in principle go back and forth from Atlantic to E. Pacific, rather than steam in one general direction.

5. WESTERN PACIFIC

Eldholm presented a list of six W. Pacific legs that were tentatively approved for drilling in 1988-1989 at the last PCOM meeting. He emphasized that these had not yet been formally approved, but PCOM plans to do this at its December meeting. The six legs are: Leg 1: Banda-Sulu-SCS Basins (BNDA-1, SUL-5, SCS-5, SCS-9); Leg 2: BONIN-1 (BON-1, BON-2, BON-5A + B); Leg 3: BONIN-11 (BON-6, + diapir or forearc terrace); Leg 4: Nankai (NKI-1, NKI-2); Leg 5: Japan Sea-1 (J-1b, J-1d, J-1e, J-3a); Leg 6: Japan Sea-11 (J-2a, JS-2). Programs for which further information or justification has been requested from various panels include: Nankai geotechnical and Zenisu (considered as a single program); Bonin reference site; Sunda; NE Australian margin; Vanautu; and Lau basin.

Cowan and Eldholm noted again that PCOM, at its last meeting, had asked TECP to review again several W. Pacific drilling programs and, in some cases, provide a further justification for drilling. Cowan reported that Nick Pisias had told him that PCOM requires an "enthusiastic" and "strong" recommendation from our panel if certain programs (e.g. Sunda, S. China Sea) are to be considered for drilling beyond FY89. Pisias also told him that our strong support for one of the "still-under-review programs" should not be construed as bumping another program off the drilling plan.

Cowan proposed to proceed systematically through the questions and requests for information that Pisias transmitted from PCOM. Cowan read the relevant sections of a letter from Pisias dated 2 September 1987.

5.1 BONIN-MARIANA

PCOM asked TECP to provide scientific justification for diapir and/or forearc-terrace drilling in the Bonins. Cowan proposed that TECP should also discuss MAR-3, the serpentinite diapir in the Mariana forearc, because we strongly advocated this site at our last meeting. Cowan also read excerpts from a memo from Brian Taylor and P. Fryer that he had received on 17 September; it described, among other things, results from Alvin dives this summer at MAR-3. Tamaki summarized the results of very successful Japanese dredging in the vicinity of BON-7. Exciting results from MAR-3 included evidence for active venting of fluids at Conical Seamount.

TECP then addressed at length two questions: why and how should a serpentinite diapir be drilled; and are the features at both MAR-3 and BON-7 diapirs? Several strategies for diapir drilling were discussed. A hole near the center of the diapir would be assured of penetrating the main mass, sampling in situ fluids, measuring T and possible fluid pressures, and obtaining samples with in situ fabric. A hole on the flanks, drilled in layered sediment resolved by seismic profiles would be assured of penetrating at least some sediment that could be used to date deformational events (tilting) possibly related to emplacement of the diapir. Such a hole would also determine the frequency and age of serpentinite debris flows supplied by the diapir. It could also give some indication of the subsurface geometry of the diapir; e.g. are its flanks steep, or do they flare outward. There was general agreement that studying the fluids that are known to be actively vented from a diapir is important; these results would complement findings from Legs 110 and 112 concerning fluids in forearcs.

TECP unanimously agreed that Conical Seamount (MAR-3) is a diapir. Its opinion was divided on whether the feature at BON-7 is a diapir. Moore displayed a bathymetric map and seismic profile. It was noted that the BON-7 seamount is one of a series of roughly aligned bathymetric highs. Perhaps it is part of an intricate thrust slice striking parallel to the trench. In TECP's opinion, available geophysical data and sampling have not conclusively established that the feature is an active, venting diapir; future studies may do so. In contrast, Conical Seamount is known to be active, and has higher priority. Drilling BON-7 would enhance the transect aspect of the Bonin program, and at the same time would probe an interesting topographic feature in the Bonin forearc.

TECP CONSENSUS:

We strongly and enthusiastically recommend drilling two holes on Conical Seamount in the Marianas to study the fabric, fluid regime, and history of an active serpentinite diapir: one hole near the center, and one near the diapir in sediment ponded on its flanks. We assign a lower priority to drilling one hole at BON-7, largely because the origin of the seamount is obscure or controversial.

5.2 NANKAI

PCOM approved drilling at NKT-1 and 2, and it will consider a second leg beyond Fiscal Year 1989 that could include geotechnical studies and drilling at Zenisu Ridge. Meanwhile, PCOM asked TECP to examine sites NKT-3 and 7 as part of a possible program devoted to hydrologic processes in the prism. There was of course general agreement that the topic -- fluids in accretionary prisms and forearcs -- is a highly visible and promising field of investigation. One question that could be addressed at upslope sites on the Nankai prism is the nature of fluid flow along presumably out-of-sequence thrusts. Although TECP supports the general theme, there is already a proposal -- 233/E -- that addresses the hydrogeology of the Cascadia prism off Oregon. As yet, there is

no formal proposal addressing hydrologic problems per se in the Nankai prism, but TECP would be pleased to review any that become available.

TECP CONSENSUS:

We support the general themes of fluid flow and composition in accretionary prisms and forearcs. There is as yet no formal proposal specifically addressing these problems at Nankai, but we will review such a proposal if one is submited, and compare it to 233/E.

5.3 LAU BASIN

PCOM asked TECP for its views on tectonic objectives to be addressed in the Lau backarc. The drilling program as presently envisaged by PCOM will focus on backarc processes; proposed forearc sites (LG-3, 6) in the WPAC prospectus aren't included. TECP first tried to define tectonic problems concerning backarc basins that could in theory be addressed in the Lau-Tonga system. Possibilities include: where does back-arc rifting initiate (in the arc, at its rear margin); the nature and symmetry of early spreading. Existing bathymetric and magnetic data are very complex and difficult to interpret in terms of spreading history; spreading may have been characteristically diffuse. The clear TECP consensus was that the backarc sites as proposed exclusively address lithospheric (ocean crust and hydrothermal) problems. From available data, we can't put these sites into a tectonic context, nor can we formulate specific questions to be tested by drilling.

Concerning the forearc sites, Moore said that WPAC would like our support for LG-6 in particular. However, TECP finds it difficult to put these forearc sites into a proper tectonic framework. We view LG-6 as a reconnaissance-style hole to "see what's there"; in its favor is its likelihood of sampling the basement of the forearc. A better approach would be a systematic drilling program, designed to test specific models of arc-backarc evolution.

TECP CONSENSUS:

Because there are so many unresolved questions about the spreading history in the Lau basin, we are not able to discern how proposed backarc drilling will solve general or specific tectonic problems related to backarc-arc evolution. LG - 3 and 6 will help establish the nature of basement in the arc and forearc, but a more extensive, multi-site drilling program is probably required to get at fundamental tectonic problems.

5.4 SUNDA

PCOM may consider this program for drilling after FY 1989, if TECP can strongly and enthusiastically recommend it. Silver submitted a revised 242/D that attempted to address some of the criticisms we raised at our last meeting. Cowan distributed copies of the revised 242/D at the meeting. Sites S1, S2,

S3, T1, and T2 were shifted to second priority in favor of four new sites that are better supported with geophysical data. Silver is currently (during this meeting) in the Indonesian region attempting to obtain additional site-survey data. Brian Taylor notified Cowan by phone on 17 September that Indonesia had denied Silver permission to operate in her waters, jeopardizing the entire survey and possibly drilling; a rumor surfaced at the meeting that Indonesia had finally relented.

As is clear from the record, TECP has long supported drilling to address the nature of collisions, and it was pointed out that this is the only proposal (other than Vanuatu) designed around collisional objectives in the program at this time. TECP had a long discussion centered around *how* collisional problems can be addressed by drilling, and whether 242/D satisfactorily does so. Key points raised during the discussion are summarized as follows. The approach taken by the revised drilling program is to determine the history of vertical motion in three parts of the system (Sumba Ridge, Flores backarc, Wetar Strait). These data may provide evidence for how collision-related deformation is distributed and possibly linked across the arc, from forearc to backarc. TECP concluded that evidence concerning the timing of vertical movements will be the main outcome of the drilling program.

Several panel members did not believe, however, that this information can uniquely or adequately test diverse hypotheses regarding "rapid vs. slow underplating," "deformation of the backstop," "links . . . between backthrusting and backarc thrusting," and the like. They pointed out the myriad variables -- changing velocities of convergence, the known existence of continental fragments like Timor and Sumba, for example -- whose effects on these processes can't be readily evaluated, with or without additional seismic data *or* drilling. In other words, evidence from drilling can be used to erect diverse hypotheses; it cannot prove one or another model, as is implied in the proposal. Other panelists either disagreed or argued that the information supplied by drilling would be interesting and novel in its own right, even if it did provide non-unique solutions.

Howell noted that COSOD-II was unable to establish how best to address collision-related problems using the drill. He wondered if the drill was indeed the best or even an appropriate tool with which to attack the problem. Some panel members wondered with him whether the data that would be obtained from the Sunda drilling would help us understand the general process of arc-continent collision; would the interpretations be applicable elsewhere? There was also general, but not unanimous, agreement that the new site-survey data won't make our reservations about drilling in Sunda, or at collisional margins in general, go away. The overall drilling strategy and kinds of information to be obtained won't change.

In light of these concerns, Hsü proposed that a workshop be convened on how to address collisions with the drillship. Such a workshop should include geoscientists with diverse backgrounds, who work on land and in the marine realm. Its goal would be to devise a drilling strategy.

TECP MOTION: TECP supports convening a workshop to develop a drilling strategy designed to address collision-related problems.
MOVED: Hsü
SECONDED: Howell
12 in favor
0 against
0 abstain MOTION PASSED

TECP CONSENSUS:

Our position regarding this program hasn't changed. We recognize that collision-related processes are important, but are unsure of the best drilling strategy. We still have doubts that the information that would be provided by the Sunda drilling program, in its present form or even if supported by new geophysical data, will uniquely resolve fundamental questions about arc-continent collisions.

5.5 SOUTH CHINA SEA (N. MARGIN TRANSECT)

In mid-September, D. Hayes notified Pisias and Cowan that he had worked up new geophysical data for this program. A revised proposal will be submitted shortly, but he asked, and Pisias and Cowan agreed, that TECP re-evaluate the program, at least in a preliminary fashion, at this meeting. The geophysical data were hand carried by Davis to Switzerland. Hsü asked if our endorsement of the program would result in the replacement of a program in the list Eldholm presented earlier [see introduction to section 5 of these minutes]. Eldholm replied that it is up to WPAC to justify an extension to the drilling already planned for the Banda-Sulu-S. China seas program, but TECP must strongly endorse the plan.

Cowan read excerpts from Hayes' letter, while the panel scrutinized the seismic profiles and their interpretation. Hayes pointed out that: basement is imaged and reachable by drilling; deeper crustal reflectors (structures) are imaged; heat flow is determined, and is high; stratigraphic information from industry wells will be available soon. He feels that there is excellent geophysical coverage now, and all that is needed is drilling to obtain primary statigraphic information.

Cowan asked that, if possible, TECP provide constructive criticism on the scientific rationale of the drilling program. The lengthy discussion that followed centered on two main questions: can drilling on this margin contribute new and original insights on a global thematic problem; and, if so, is the proposd drilling plan well designed for such a goal. There was general agreement that the new data are of high quality though some doubts were raised about the identification of certain events, expecialy basement (blue). The latter is significant because some holes are projected to penetrate basement. A consensus emerged that it will be possible to penetrate the syn-rift section,

which is essential if the early subsidence history is to be determined. There was also a general recognition that this margin is indeed an attractive place to get at the important problem of early subsidence history. Another attraction is that drilling would supplement the information that will accrue from the Japan Sea, and provide a more complete view of how marginal seas opened and evolved along the eastern margin of Asia.

Several aspects of the proposed drilling program, however, were criticized. (1) TECP doesn't think it is appropriate to call this an "Atlantic-type" margin, because it didn't form by central rifting of a huge continent. It is, rather, an example of small ocean basins that form when marginal fragments of continents rift away. It may have even formed as a large pull-apart basin in concert with slip on transcurrent faults in SE Asia and the adjacent SW Pacific. The potential information on early rift history is not devalued by the debates over its geotectonic setting, however. (2) The proposed program may still be too "one-sided." To properly evaluate models for the origin (extension) in the basin, it will probably be necessary to obtain data from the other margins of the S. China Sea. (3) TECP isn't convinced that a simple transect of several holes is needed to obtain the desired information about subsidence history. Perhaps a better approach in a revised proposal would be to present several possible hypotheses for the extensional development of the basin, and show how a proposed site or sites could test them. The deep reflector imaged suggests the possibility for a Wernicke-style geometry rather than a McKenzie "pure shear" extension. (4) The proposed transect appears to cross a transform fault that can be inferred from offset magnetic anomalies. Sites should be repositioned if necessary to avoid this complication.

Finally, Hsü noted that there is a Chinese "South China Sea Working Group," which has information that can be made available through the Ministry of Geology, especially if there is heightened interest on the part of JOIDES and ODP.

In summary TECP offers the following criticisms, guidelines, and recommendations:

(A) TECP would like to see a new proposal that is more regional (basin-wide) in scope, that more thoroughly explores diverse models for extension, and that shows how perhaps fewer sites (or even one or two, e.g. one near CDP 5200 on MCS 70) could test these.

(B) Proponents should liase with other groups interested in or working in the area and aim for a more comprehensive approach. Hsü noted that a workshop on rifted margins held in November may provide useful input.

(C) Proponents should abandon the analogy with "Atlantic-type" margins.

(D) At the least, proposed transect should not cross an interpreted transform.

(E) PRC should be encouraged to release stratigraphic data from exploratory wells.

TECP CONSENSUS:

Our interest in some form of drilling program on the margins of the S. China Sea -- to address the early rifting and subsidence history of a marginal basin formed by rifting near the edge of a continent -- is growing. We would like to be presented with a revised proposal that is more regional in scope and more attentive to alternative models for extension and how they would be tested by drilling.

5.6 SULU SEA & CELEBES SEA

Hinz said that BGR has prepared two new proposals for sites in these basins. He briefly summarized results of his recent cruises in the region and explained how drilling would determine the age of crust in these basins. Although TECP has not yet been presented with these proposals, it reiterated its support for a hole in the Celebes Sea as expressed in the minutes of its last meeting.

6. MEMBERSHIP CHANGES

Cowan noted that the following people are scheduled to rotate off the panel at the end of this calendar year: Cowan (as member and chairman); Vogt; Marsh; and Howell. Riddihough announced that he will be replaced by Srivastava, but that both would attend the next TECP meeting. Cowan said that he must step down as a member of TECP because the University of Washington has nominated his as its next PCOM representative. He asked for names of potential new members of TECP to replace those leaving. He particularly encouraged names of people who are new to the JOIDES advisory structure and who are experts in fields that are likely to be discussed in the next couple of years. Eldholm cautioned us not to recommend people who are already on other JOIDES panels.

Because such a large group of members is leaving at once, someone suggested that we ask PCOM if Vogt, Howell, and Marsh could serve a few months past their scheduled retirements and attend one more meeting of the panel. Their presence at the next meeting would ease the transition into a significantly reconstituted panel. Howell and Vogt agreed to serve. [Marsh declined in a post-meeting phone conversation with Cowan].

TECP REQUEST TO PCOM:

We ask that Howell and Vogt be allowed to serve as members through the next TECP meeting, which they would attend together with their replacements. Howell and Vogt have agreed to serve.

TECP RECOMMENDATIONS FOR PANEL MEMBERS TO REPLACE RETIREMENTS:

The following names are roughly grouped into fields of expertise; they are not limited to US scientists.

Plate kinematics and history of ocean basins:
D. Engebretson, D. Clague, Zonenshain, T. Atwater, B. Luyendyk, R. Carlson (A & M).

Structures in oceanic crust (plus kinematics and history):
K. Macdonald, J. Fox

Igneous petrology, geochemistry, isotopes:
R. Carlson (Carnegie Inst.)

General marine geology and tectonics:
S. Cande

Physical properties and fluids:
B. Carson

Mechanical Models:
R. Buck

7. NEXT MEETING

Karl Hinz kindly offered to host the next meeting in Hannover, FRG. The latter part of the first week in June, 1988, suited the members present.

The meeting adjourned at 1800 Monday evening.

JOIDES Lithosphere Panel Meeting
Institut de Physique de Globe
Univ. Pierre et Marie Curie
Paris, France
29 Sept - 1 Oct 1987

EXECUTIVE SUMMARY

1.0 Top Six LITHP Themes in CEPAC and Related Proposals

Ranking	Theme	
1.	**Structure of the lower oceanic crust**	
	Return to 504B (286E)	(1-1 1/2 legs)
2.	**Magmatic and hydrothermal processes at sediment-free ridge crests**	
	East Pacific Rise (76E Revised)	(3 legs)
3.	**Magmatic and hydrothermal processes at sedimented ridge crests**	
	Juan de Fuca Ridge (232E)	(1-2 legs)
	Escanaba Trough (224E,284E)	
	Guayamas Basin (275E)	
4.	**Early magmatic evolution of hot spot volcanos**	
	Loihi (282E)	(1 leg)
	Marquesas (291E)	
5.	**Crustal structure and magmatic evolution of oceanic plateaus**	
	Ontong-Java Plateau (222E revised)	(1 leg)
6.	**Composition and magnetization of old crust**	
	Jurassic Quiet Zone (285E)	(1 leg)

Related recommendations:

In order to help achieve LITHP drilling objectives in CEPAC we make the following related recommendations:

1) A minimum of four hard rock guidebases will be required for LITHP drilling in CEPAC. Additional guidebases will be required if any near-axis seamount drilling is carried out.

2) An engineering test leg should be scheduled for sometime in the next 12-18 months to allow ODP engineers to field test their new hard rock drilling and coring systems prior to EPR or Loihi drilling.

3) One leg of young crustal drilling should be scheduled as early as possible in the CEPAC program to allow ODP engineers to evaluate their new systems and have time to made necessary modifications.

4) PCOM should establish a working group to develop a detailed drilling plan for EPR and Juan de Fuca Ridge/Escanaba Trough including strategies for hydrothermal fluid sampling, borehole logging and downhole geophysical experiments (including VSPs, crosshole seismic tomography etc.), as well as options for long-term instrumentation of the drill-holes.

2.0 LITHP Recommendations on WPAC drilling

2.1 Geochemical Reference Holes

LITHP believes a minimum drilling strategy for a reference hole program in the western Pacific is one deep hole outboard of the Bonins and three shallower holes near the Mariana transect of DSDP Legs 59 and 60. This program will require 1 1/2 legs of drilling.

2.2 Bonin diapir and forearc drilling

LITHP recommends a half-leg be devoted to drilling a forearc diapir and the adjacent forearc ridge in one arc, rather than drilling diapirs in two different arcs. The panel endorses drilling Conical seamount (MAR-3) and an adjacent forearc site in the Marianas as its highest priority.

2.3 Mississippi Valley Deposits Proposal (268D)

The Mississippi Valley deposits proposal addresses important scientific questions related to the formation of carbonate-hosted lead-zinc deposits. However, this program is not central to LITHP thematic objectives, either globally or in WPAC. We suggest additional efforts be made to integrate this work with SOHP objectives in the area, but in terms of an extra half-leg, reference hole drilling and forearc diapir drilling are higher priorities for LITHP.

2.4 Lau Basin

(1) LITHP recommends a 1-leg program concentrating on back-arc processes in the Lau Basin. The highest priority sites are LG-2 in the western Lau Basin which should be drilled to a least 200 m sub-basement, LG-3 on the Tonga platform which should be drilled to Unconformity A and LG-7 or LG-1._ None of the sites require bare-rock drilling.

(2) A separate engineering development leg should be approved for Lau Basin to field test new hard-rock drilling and coring systems under development for CEPAC drilling. Final site selection should be based on engineering requirements, but LG-1 on- or near-axis between 18-19°S would be our first choice, with LG-4B or LG-4C on Valu Fa ridge as potential alternative sites.

3.0 Other matters

3.1 Next LITHP Meeting scheduled for 1-3 March, 1988 in Hawaii

3.2 Nominations for new panel members:

D. Clague	B. Bryan
J. Natland	M. Perfit
N. Sleep	J. Orcutt

3.3 LITHP endorses acquisition of the Formation Microscanner by ODP

JOIDES Lithosphere Panel Meeting
Institut de Physique de Globe
Univ. Pierre et Marie Curie
Paris, France
29 Sept - 1 Oct 1987

Members present:

R. Detrick (URI), Chairman
R. Batiza (Northwestern)
K. Becker (RSMAS)
K. Bostrom (ESF)
H. Elderfield (UK)
T. Fujii (Japan)
J. Hawkins (SIO)
C. Langmuir (L-DGO)
J. Malpas (Canada)
M. McNutt (MIT)
C. Mevel (France)
J. Mutter (L-DGO)
J. Pearce (UK)
N. Peterson (Germany)
J. Sinton (HIG)

In attendance:

A. Adamson (TAMU)
E. Davis (CEPAC)
M. Fisk (SOP)
P. Robinson (PCOM)
S. Scott (WPAC)

Absent:

R. Duncan (IOP)
M. Kastner (PCOM)
K. Klitgord (ARP)

AGENDA

1. PCOM Report (both CEPAC/LITHP panels)
2. Reports from other liaisons
3. CEPAC proposals evaluation and ranking
4. LITHP CEPAC Drilling Themes
5. Joint CEPAC/LITHP meeting (Sept. 30th)
6. WPAC prospectus and PCOM evaluation
7. Other matters
   - Next meeting
   - Panel membership
   - Formation Microscanner

MINUTES

1.0 PCOM Report (both CEPAC/LITHP panels):

The meeting began at about 9:15 am with both the CEPAC and LITHP panels in a joint session to hear a report from R. Larson on the August PCOM meeting in Tokyo. He reviewed two major items of interest to the panels: (1) PCOM decisions on the ODP budget for FY 1988, and (2) proposed changes by PCOM in the panel mandates and the proposal review process.

1.1 FY 1988 ODP budget

The FY 1988 ODP budget will total about $36 million. PCOM has mandated that 3-4% of this budget (~$1.1-1.4 million) be reserved for special projects (eg. guidebases, ice support vessels, etc.).

In order to satisfy this requirement, and still stay within the current budget, PCOM approved $1,150,000 in cuts elsewhere in the TAMU budget. These include (budget savings in parentheses):

* Publication of only 1000 Part A & B volumes (with 1000 microfiche copies) ($50K)
* TAMU headquarters ($200K)
* Computer services ($100K)
* 5 TAMU grad. res. assts. ($50K)
* 2 database positions ($42K)
* Res. elec. eng., travel ($88K)
* Camera-ready Part B figures ($171K)
* Reduction of 3 staff scientists positions ($143K)
* Reductions in technician and laboratory support ($211K)

Larson answered several questions about the changes in publication policies. Part B of the Proceedings volumes will be retained. Part B will be type-set, but camera-ready figures must be supplied by the authors. Other changes include elimination of the color frontispiece from the Proceeding volumes and reducing the number of pages in the Part A volumes from 1000 to 800.

It was also noted that the XRF/XRD will remain aboard the drillship and TAMU is committed to operate these instruments on critical legs.

1.2 Changes in panel mandates and proposal review process

Larson reported that PCOM discussed the JOIDES advisory structure at its last meeting. They believe the ODP community would like to see a more thematically driven planning process, however PCOM feels that major changes in the panel structure should occur in "an evolutionary rather than a catastrophic fashion". PCOM has therefore appointed a subcommittee composed of four PCOM members (Asahiko Taira, Tim Francis, Marc Langseth, Margaret Leinen), plus Ross Heath of EXCOM, to provide recommendations on long-term changes in the panel structure.

In the interim, however, PCOM has adopted a new "proposal evaluation process" (see Appendix A). Under this plan, thematic panels are asked to

evaluate and rank proposals with respect to the major themes identified by the panel, and as to how well proposals address those themes. In the case of CEPAC, the thematic panels are requested to identify their six top thematic objectives. Regional panels are asked to evaluate only those proposals passed on by the thematic panels. They are to evaluate the proposals in terms of (1) maturity, (2) adequacy of documentation, and (3) probability of success, and construct a preliminary drilling prospectus. The thematic panels will review this prospectus to see how well the drilling program meets their thematic goals. Finally, all this information will be passed onto PCOM for formulation of the final ODP drilling schedule.

This new plan illicited a number of comments ranging from formal protest to outright support. One common concern was that the regional panel would be relegated to merely "bookkeeping" and would not retain a role in providing scientific input to the drilling plan.

After this brief airing of opinions, the two panel adjourned to separate rooms and continued their meetings.

2.0 Other liaison reports

2.1 IOP Report (C. Langmuir)

The IOP has not met since the last LITHP meeting so there was nothing new to report. C. Langmuir noted that he cannot attend next IOP meeting scheduled for late October in Rome. Detrick asked for volunteers to attend as LITHP liaison, but none were forthcoming. He therefore agreed to contact R. Schlich before their meeting to find out what, if any, LITHP input was required by IOP for this meeting (done; no reply).

2.2 WPAC Report (J. Hawkins)

WPAC also has not met since the last LITHP meeting. Their next meeting is Nov. 2-5 in London. Discussion of LITHP response to PCOM's evaluation of the 3rd WPAC prospectus was deferred to Thursday (agenda item 6).

2.3 TAMU (A. Adamson)

A. Adamson updated the panel on the status of the new mine coring system (MCS) and the preparations for Leg 118. TAMU now has two full-time engineers working on the MCS. Plans call for it to be tested on Leg 121. The NaviDrill will be available for use on Leg 118.

3.0 CEPAC Proposal Evaluation and Ranking

The review of specific CEPAC proposals, begun at the May LITHP meeting, continued with the discussion of fourteen new or revised proposals with significant lithospheric drilling objectives.

1.0 Ontong-Java Plateau (222E Revised)

This revised proposal clarifies the crustal basement objectives in the original OJP drilling proposal and modifies the drilling plan to make

both OJ1 and OJ2 basement re-entry holes, while eliminating OJ6 which addressed collisional processes on the western margin of the plateau.

- the panel felt this proposal addresses fundamental lithospheric problems, especially in terms of the crustal structure, petrogenesis and age relationships on oceanic plateaus. Since drilling is the only way to sample basement at OJP (and most other oceanic plateaus), this is a problem which ODP is well-suited to address.

- OJP is one of the largest oceanic plateaus, and relatively well-studied, making it a logical choice to focus a plateau drilling program.

- the panel felt one or two relatively deep holes (300-500 m into basement) were preferable to many shallow holes as a drilling strategy. The elimination of OJ6 was supported since the panel felt it is difficult to address collisional tectonic processes with drilling.

- deep-penetration MCS data would be useful for locating potential crustal holes, however the panel felt the lack of such data should not preclude drilling OJP at the present time. The proposed holes would at best only penetrate 1/60th of the 30+km thick plateau crust anyway and MCS data could be collected after the drilling. At this point, the panel felt any well-located, stratigraphically-controlled basement samples from this huge, virtually unknown feature would be valuable.

2.0 Blanco Transform (278E)

Five basement penetration holes are proposed in the Gorda Depression, Cascadia Depression and West Blanco Depression of the Blanco Fracture Zone to: (1) penetrate hydrothermally altered crust in the fault zone, (2) sample lower levels of the oceanic crust, and (3) sample basement in pull-apart basins within the fracture zone.

- this proposal addresses two important LITHP themes; water-rock interactions and the structure of the lower crust.
- though this area is relatively well-surveyed, insufficient site survey data is available to properly locate these drill holes; in this sense this is still an immature proposal.

- questions were raised about the objectives of the hydrothermal drilling at BEZ-1 - is this just a fishing expedition? What can be learned about hydrothermal systems here that can't be better studied elsewhere in the Juan de Fuca/Gorda/EPR ridge system?

- some of the proposed drilling objectives may be satisfied by a detailed submersible sampling program. The igneous and tectonic processes associated with small pull-apart basins, in particular, may be better studied at Garret, Clipperton or Siqueiros where they are not buried by sediment and may be directly accessed by the submersible.

3.0 Anatomy of a Seamount - Seamount 6 at EPR (279E)

A single 1200+m deep, bare-rock drill hole is proposed through a typical near-ridge, non-hot spot volcano in order to determine its internal composition and structure. These small seamounts are the most abundant volcanos on Earth and the proponents argue this drilling would provide important constraints on their growth and magmatic evolution, associated hydrothermal processes, and the tholeiitic to alkalic transition.

- as the most abundant volcanos on Earth, the structure and magmatic evolution of these seamounts are of major thematic interest to LITHP; seamount hydrothermal systems may differ from those at spreading centers and this is also of interest to LITHP.

- seamount 6 has been exhaustively studied and would make an ideal drilling target.

Two major concerns were raised about this proposal by the panel:

(1) The location of the drill hole in the caldera was questioned. The caldera will be structurally very complex with dikes, sills, and small plutons, plus hydrothermal stockworks and deposits. Successive intrusive events and episodic caldera collapse may result in an extremely complex vertical stratigraphy that may be almost undecipherable. The panel recommends the proponents consider the relative merits of a flank vs a caldera hole.

(2) The proposal does not really clearly state the key questions regarding seamount structure and evolution that drilling can answer. What hypotheses will be tested? What are the specific drilling objectives? What will we learn from this hole?

- the technical feasibility of this drilling (approximately equivalent to another 504B) was noted. The alternative of submersible sampling of a feature like Split Volcano was mentioned.

- the consensus of the panel was that this and other near-axis seamount proposals (see below) should continue to be developed. The panel also felt any seamount drilling program should be closely linked to investigations (including drilling) of the adjacent spreading center.

4.0 Axial Seamount (290E)

This proposal has very similar objectives to 279E. Three holes are proposed - two on Axial seamount and a third on Brown Bear Seamount on older crust west of the rise axis. The proposal has both magmatic and hydrothermal objectives that are of considerable interest to LITHP.

- Axial seamount is extremely well-studied; it is close to North American ports which is a logistical advantage, but the weather window is shorter than 13°N which is a disadvantage.

- as in the case of 279E, questions were raised about the usefulness of drilling in the summit caldera to investigate magmatic processes; ridge flank holes may yield a more complete and interpretable record. However, a caldera hole can be valuable for investigating seamount hydrothermalism.

- the relative merits of drilling Axial and Brown Bear seamounts were discussed. At Brown Bear seamount it will be possible to recover the whole sequence of lavas from the early to late stages of magmatism, This is not possible at Axial seamount. Thus if the primary objective is the magmatic history of this seamount, it is thus hard to justify drilling Axial seamount if Brown Bear is also drilled. On the other hand, if the main objective is hydrothermal then Axial seamount is a better target.

- as in the case of 279E the panel felt this proposal should be developed further. The proponents should clarify whether the highest priority objectives are magmatic or hydrothermal, and more specifically indicate the kind of information the proposed drilling will provide.

5.0 Geisha Seamounts (280E)

One and a half ODP legs are proposed for drilling the Geisha seamount chain in the western Pacific. The objectives of this drilling are not clearly stated, but appear to be: (1) determining the age progression along the seamount chain, (2) constraining absolute plate motions for >70 Ma, and (3) determining compositional differences with Hawaiian-Emperor seamounts.

- to the extent that samples from these seamounts provide a window into the geochemical evolution of the upper mantle this proposal is of interest to LITHP, but the age-dating and plate motion objectives are not high priority LITHP themes in the Pacific.

- the panel felt that many of stated drilling objectives could be achieved by a detailed dredging program (several of the sites are "bare-rock" holes).

- as written, the proposal provides little information on drilling strategy - why re-entry holes on some seamounts and not others; single-bit, "bare-rock" holes are proposed which seem hard to justify given the expense and time required to deploy a hard-rock guide base.

6.0 Tracing the Hawaiian Hotspot (282E)

The objective of this proposal is to drill sediments within the Hawaiian flexural moat to constrain the absolute motion of the Pacific plate with respect to the Hawaiian hot spot and define the relationship between plate motion and plate subduction. Serious questions were raised on the panel about the feasibility of this proposal:

- dating will be a problem in the moat sediments since deposition of widespread ash deposits is relatively rare.

- it is unclear how changes in absolute plate motions will be detected; the proposed method appears to require that volcanism be related to absolute plate motion which is not obvious.

- the proposed drilling could not be carried out as part of the Hawaiian flexure drilling (3E) since the holes for this project must be drilled along, rather than across, the moat.

- this proposal has serious deficiencies and we recommend it be dropped from further consideration.

7.0 Kuroshiro extension and Pacific plate motion (283E)

This drilling proposal is designed to test the hypothesis that the Kuroshiro Current has played an important role in controlling the sedimentation history of the northwest Pacific. In the process of testing this hypothesis the proponents also hope to study the interplay between the stability of the current and absolute Pacific plate motions.

- this proposal does not really address any major LITHP thematic objectives in the CEPAC area.

- this is not the best way to resolve absolute plate motions; there are just too many variables. Any drilling addressing this problem should be justified by the sedimentological or paleoceanographic objectives, not the lithospheric or tectonic objectives.

8.0 Escanaba Trough I (224E Revised)

The original version of this proposal was reviewed at the May LITHP meeting. It proposes drilling in the Escanaba Trough to determine the timing and compositional variability of magmatic activity on a 10,000-100,000 year time scale. The revised proposal addresses questions raised about this proposal by LITHP.

- this drilling clearly addresses problems of ridge crest magmatism of major interest to LITHP. The major problem with the program is the feasibility of dating the sediments with sufficient accuracy to construct a reliable chronology of eruptive events.

- LITHP supports efforts by the proponents to carry out a detailed piston coring program in this area. They must demonstrate the feasibility of stratigraphic mapping and dating in these sediments before a drilling program can proceed.

- if piston cores are successful in extending coverage to >30,000 yrs some questions were raised about how much more will be learned by drilling if it only extends the historical record back to 100,000 yrs. Could the infamous "Long Coring Facility" do this job more cost effectively?

- despite these questions, LITHP would like to see the proponents continue to develop this proposal as a potential component of a sedimented ridge crest drilling program.

9.0 Escanaba Trough II (284E)

This proposal, like 224E (Middle Valley, Juan de Fuca Ridge), is aimed at studying hydrothermal processes and ore genesis at a sedimented ridge crest. Holes are proposed in two areas of the Escanaba Trough in massive sulfide deposits, on top of uplifted sediment hills, and in sediments away from volcanic centers.

- this proposal addresses major COSOD and LITHP thematic objectives; drilling hydrothermal systems at sedimented ridge crests should be a high priority for the next phase of CEPAC drilling.

- this area is well-studied and on-going and planned surveys should provide a geological and geophysical database comparable to that available in Middle Valley. Logistically it is well-situated and the weather window might be slightly better than for Juan de Fuca Ridge.

- one major disadvantage to drilling this area is that the hydrothermal system is not apparently active. There was a consensus on LITHP that the highest priority is to drill the upflow zone of a major active vent system. As is pointed out in this proposal, there is also value in drilling a fossil system, but we believe it is a lower priority and should be done, if possible, in the same area where the active vent is drilled.

- as written, the proposal may be overambitious in trying to drill too many holes. LITHP would like to see fewer holes with at least one relatively deep (500 m) basement re-entry hole.

- LITHP encourages the proponents to continue to develop this proposal as a component of a lithospheric drilling program on sedimented ridge crests.

10.0 Jurassic Quiet Zone (285E)

One or more deep basement drill holes are proposed in the Jurassic Quiet Zone to: (1) determine the origin of the weak magnetization responsible for the magnetic quiet zone, (2) serve as a geochemical reference section for old Pacific crust, and (3) provide information on the paleoceanography of the middle/late Jurassic and early Cretaceous.

- the origin of the Jurassic quiet zone, the magnetic properties of oceanic crust, and the geochemical characteristics of old Pacific crust are all important lithospheric themes discussed in the LITHP White Paper.

- this is a good use of the drill ship; it is technically feasible (if the chert problem can be solved) and LITHP, TECP and SOHP objectives can all be addressed in a single hole.

- LITHP favors deep (ca. 500 m) holes; good MCS data is needed to properly locate potential sites.

11.0 Return to 504B (286E)

This proposal argues that despite the problems on Leg 111, Hole 504B still represents our best chance reach layer 3 in the foreseeable future. The proponents discuss several options for a return to 504B, but favor a plan to schedule an early engineering leg to clean and recase 504B and set one guidebase on the EPR before drilling 504B.

- thematically, this program represents one of LITHP's highest global priorities and is a goal that has been repeatedly endorsed by the larger scientific community at both the COSOD and COSOD II conferences.

- cleaning the junk left in the hole or deviating the hole around the junk are both feasible alternatives for deepening 504B. LITHP favors either of these options over abandoning 504B to drill (without coring) a new hole nearby.

- LITHP would strongly endorse a sidewall coring program in any return to 504B. In fact, some on the panel felt obtaining this systematic and uniform sampling from the existing hole was nearly as important as deepening 504B.

- one argument that has been raised against continuing to drill 504B is the "von Herzen" curve that appears to show an exponentially decreasing recovery rate. However, it was noted that this curve includes in the cumulative drilling time operations that did not involve drilling. In fact, some of the best penetration rates in Hole 504B were obtained at the beginning of Leg 111. Moreover, there is hope the new mine coring system will significantly improve penetration and recovery rates.

- since many of the problems in 504B are believed to be thermally related, the alternative of drilling an older site like Hole 418A was discussed. While this may be a sensible long-term alternative, the same technical problems will eventually be encountered in these holes as well (although possibly at greater depths). We believe it is best to concentrate on dealing with these known problems now in 504B, rather than gambling that another hole somewhere else will not encounter these, or other more intractable, problems.

In summary, LITHP's long-term objective is to get the technology to drill really deep into the lower oceanic crust or to Moho. While this drilling will ultimately be done elsewhere, Hole 504B represents our best chance to achieve the important short-term objective of reaching the top of layer 3 before COSOD III! Returning to 504B would also provide a clear thematic focus and deadline for the ODP engineering effort that will be necessary to achieve this top priority lithospheric drilling goal.

12.0 Drilling the M-Series, Western Pacific (287E)

Drilling is proposed to determine the nature of an apparent systematic along-strike variation in crustal magnetization in the M-series anomalies. A second simultaneous goal is to sample early Cretaceous sediments and to determine the geochemical character of the oceanic crust being subducted under the Bonin arc.

- this proposal includes drilling objectives of thematic interest to LITHP, particularly establishing a geochemical reference section seaward of the Bonin arc.

- the along-strike magnetic variations described in the proposal are intriguing, but need to be better constrained by a surface ship magnetic survey before they are adopted as a drilling target. In general, the panel felt the magnetic questions addressed in the Jurassic Quiet Zone proposal were of higher priority.

- in addition to a magnetic survey, deep reflection seismic data are needed to choose drilling sites.

13.0 Drilling of hydrothermal systems on the EPR (76E Revised)

This is a revision of the original EPR drilling proposal submitted several years ago. It is focussed primarily on drilling active and inactive hydrothermal systems on the rise axis near 12°50'N and on an adjacent off-axis volcano. Three bare-rock holes are proposed on the rise axis, 100 m apart, arranged in an L-shaped pattern. A fourth bare-rock site is proposed for drilling into the summit of a near-axis seamount.

- this proposal clearly addresses problems of magmatism and hydrothermal circulation at mid-ocean ridges that are of very high priority to LITHP and that were strongly endorsed by COSOD.

- the proposed drilling program is well-focussed for addressing the hydrothermal problem; drilling on a sediment-free ridge crest will complement drilling a sedimented hydrothermal system on the Juan de Fuca/ Gorda Ridge.

- the close spacing of the proposed axial drill holes is ideal for cross-hole seismic tomography and EM experiments.

- although thematically, LITHP rates this program very highly, the proposal itself was still considered inadequate. It needs a better developed drilling program (including drilling time estimates etc.), and more specific information on the associated logging, geochemical sampling and borehole geophysical experiments. LITHP recommends (see below) that an EPR Working Group be established with the appropriate expertise to develop a detailed drilling strategy.

14.0 Drilling the Marquesas Island Chain (291E)

This is a proposal to drill through the archipelagic apron into volcanic basement at several locations in the Marquesas volcanic chain. The drilling will address the development of the deep structure of the chain, the response of the lithosphere to volcanic loading, and the composition of lavas representing the early eruptive stages of the chain.

- this proposal addresses important LITHP drilling themes in the Pacific including hot spot volcanism and the thermal and mechanical response of the lithosphere to volcanic loading.

- the Marquesas are a different expression of hot spot volcanism than Hawaii that may be more typical of mid-plate volcanism.

- drilling and sampling the pedestal building stage of island formation would be very valuable.

- dating of sediments in the flexural moat may be easier than at Hawaii, however there is no evidence yet in the Marquesas for the well-developed moat stratigraphy documented at Hawaii.

- additional site survey data (especially MCS) are needed to define the deep pedestal structure of the islands and determine the stratigraphy within the flexural moat.

15.0 Rankings

Following the procedure begun at the May LITHP meeting, the proposals described above were divided into four groups. Group 1 are the proposals which have LITHP's highest ranking - they all are programs that address fundamental global lithospheric problems and, in our opinion, should be part of any Pacific drilling program. Group 2 proposals are ranked high by LITHP, but with certain qualifications mentioned above. We encourage the proponents to continue to develop these proposals. If these problems are resolved, or if higher ranked proposals prove technically or logistically unfeasible, they could potentially move into our Group 1 category. Group 3 proposals have important scientific objectives, but have limited lithospheric drilling objectives - we hope they get drilled, but they are not our highest priority in the Pacific. Group 4 proposals are either scientifically immature or have serious deficiencies - they are programs we recommend be dropped from further consideration. (The following list includes all CEPAC proposals reviewed by LITHP to date; within each grouping the proposals have not been prioritized).

Group 1 (Highest Ranking)

Juan de Fuca/sedimented ridge crest (232E)
Young hotspot volcano - Loihi (252E)
East Pacific Rise (76E Revised))
Return to 504B (286E)
Ontong-Java Plateau (222E Revised)
Jurassic Quiet Zone (285E)

Group 2 (High, but with qualifications)

Early continental rifting; Gulf of Calif. transect (275E)
Guayamas hydrothermal (275E)
Hawaiian flexure (3E)
Escanaba Trough (224E, 284E))
Old Pacific Crust (261E)
Axial Seamount (290E)
Seamounts 6 EPR (279E)
M-Series (287E)

Group 3 (Limited LITHP interest)

Atolls and guyots (202/203E)
Ontong-Java (248E)
Magnetic Quiet Zone (231E)
Geisha seamounts (279E)
Kuroshiro Extension (283E)

Group 4 (Immature/serious deficiencies)

Galapagos stockwork (258E)
Explorer Ridge (263E)
Manzanillo Rift (275E)
Blanco transform (278E)
Tracing Hawaiian hotspot (282E)

4.0 LITHP CEPAC Drilling Themes and Related Proposals

Following the PCOM directive to identify our panel's six highest priority thematic objectives in the CEPAC area, a list of thirteen drilling themes was constructed. (For a more detailed description of each theme see the LITHP White Paper). These thirteen themes were:

1. Magmatic and hydrothermal processes at sedimented ridge crests
2. Magmatic and hydrothermal processes at sediment-free ridge crests

3. Magmatic and hydrothermal processes at near-axis seamounts
4. Magmatic evolution of young hot spot volcanos
5. Structure of the lower oceanic crust
6. Crustal structure and magmatic history of oceanic plateaus
7. Composition and magnetization of old oceanic crust
8. Thermal and mechanical response of the lithosphere to volcanic loading
9. Development of young oceanic rifts
10. Along-strike segmentation of magmatic processes
11. Temporal variability of hot spot volcanism
12. Magmatic processes at convergent margins
13. Oceanic fracture zones

All of these themes can be addressed, in one fashion or another, in the CEPAC area (12 of the 13 themes are associated with at least one CEPAC proposal). The panel prioritized these themes using the following procedure: Each panel member listed their six highest priority themes from this list. Each theme was awarded one point for each vote it received. The six themes with the highest number of votes were then listed and the panel voted a second time to determine their relative priority - a first place vote was awarded six points, second place five points etc. The seven themes that did not make the initial cutoff were also prioritized in a similar fashion. The results are summarized in the accompanying table with a listing of each theme, their relative ranking, the associated CEPAC proposals that are rated highly by LITHP, as well as an approximate estimate of the drilling time required to achieve each drilling objective. Where more than one proposal is identified with a particular theme, they are listed in order of priority.

Two important points regarding these recommendations should be emphasized. The top four LITHP drilling themes in CEPAC require bare-rock drilling (EPR, Loihi), young crustal drilling (EPR, Juan de Fuca, Loihi) or high-temperature drilling (504B, EPR, Juan de Fuca, Loihi), none of which are technically feasible at the present time. If the highest priority lithospheric drilling objectives in CEPAC are going to be addressed in this next round of drilling, a major improvement in crustal drilling technology must be achieved over the next 3-5 years. This will require appropriate long-term planning by PCOM and a major commitment of manpower and resources by ODP/TAMU.

In addition to the development of new drilling technology, achieving the highest priority LITHP drilling objectives in the CEPAC area will also require the commitment of substantial amounts of drilling time. A realistic estimate of the drilling time required to address all six LITHP CEPAC drilling objectives is 8-10 1/2 drilling legs; just the top four drilling themes, which we consider a minimal lithospheric drilling program in CEPAC, will require 6-8 1/2 legs of drilling. We believe devoting this amount of drilling time to LITHP objectives in CEPAC is justified because these are, and have been, our panel's highest global thematic priorities. Only 3 legs (106, 109 and 111) will have been devoted to these objectives in the first 5 years of ODP. This will, however, require a change in the present plan to devote only nine legs to CEPAC drilling since important SOHP and TECP objectives exist in this area as well.

LITHP CEPAC Drilling Themes

Ranking	Theme	Votes
1.	**Structure of the lower oceanic crust** Return to 504B (286E) (1-1 1/2 legs)	73
2.	**Magmatic and hydrothermal processes at sediment-free ridge crests** East Pacific Rise (76E Revised) (3 legs)	65
3.	**Magmatic and hydrothermal processes at sedimented ridge crests** Juan de Fuca Ridge (232E) (1-2 legs) Escanaba Trough (224E,284E) Guayamas Basin (275E)	54
4.	**Early magmatic evolution of hot spot volcanos** Loihi (282E) (1 leg) Marquesas (291E)	46
5.	**Crustal structure and magmatic evolution of oceanic plateaus** Ontong-Java Plateau (222E revised) (1 leg)	45
6.	**Composition and magnetization of old crust** Jurassic Quiet Zone (285E) (1 leg)	34
7.	Magmatic and hydrothermal processes at near-axis seamounts	
8.	Thermal and mechanical response of the lithosphere to volcanic loads	
9.	Temporal variability of hot spot volcanism	
10	Along-strike segmentation of magmatic processes	
11.	Development of young oceanic rifts	
12.	Oceanic fracture zones	
13.	Magmatic processes at convergent margins	

Related recommendations:

In order to help achieve LITHP drilling objectives in CEPAC we make the following related recommendations:

1) A minimum of four hard rock guidebases will be required for LITHP drilling in CEPAC. Additional guidebases will be required if any near-axis seamount drilling is carried out.

2) An engineering test leg should be scheduled for sometime in the next 12-18 months to allow ODP engineers to field test their new hard rock drilling and coring systems prior to EPR or Loihi drilling. A western Pacific back-arc basin (eg. Lau Basin) would be an ideal location for such a test, but it should be in addition to, and separate from, any scientific drilling in this same area (see related recommendations for Lau Basin drilling in section 6.4 of minutes).

3) It is desirable to attempt one leg of young crustal drilling as early as possible in the CEPAC program to allow ODP engineers to evaluate their new systems and have time to made necessary modifications. This might be done in conjunction with cleaning and recasing Hole 504B as suggested in proposal 286E.

4) We recommend PCOM establish a working group to develop a detailed drilling plan for EPR and Juan de Fuca Ridge/Escanaba Trough including strategies for hydrothermal fluid sampling, borehole logging and downhole geophysical experiments (including VSPs, crosshole seismic tomography etc.), as well as options for long-term instrumentation of the drillholes. The composition of the working group should be determined by the PCOM Chairman in consultation with the LITHP Chairman.

5.0 Joint LITHP/CEPAC Meeting (Sept. 30th)

The LITHP and CEPAC panels met jointly on the afternoon of September 30th. R. Detrick summarized for CEPAC the LITHP thematic objectives in the CEPAC area and the highest ranked related proposals. In the course of this presentation the following points were discussed:

- J. Francheteau raised the question of whether Hole 504B should be reoccupied or if deep crustal drilling should be attempted at another, older site (eg. Hole 418A). LITHP re-iterated its position that 504B is probably our only chance to reach layer 3 in a single leg of drilling in the next 5 years. It is LITHP's position that the drilling problems at 504B will eventually be encountered in any deep crustal hole. Since these problems must be solved to achieve our long-term objective of deep crustal drilling, we believe 504B is as a good place as any to do this, while at the same time achieving a long-standing goal of scientific ocean drilling - reaching oceanic layer 3.

- in reference to EPR drilling, E. Davis questioned how long it would take to complete the proposed program. It was noted that this very much depends on the drilling and coring technology, but a reasonable estimate is about 3 drilling legs (one leg per hole). It was noted that

it is not necessary or desirable to drill these as three consecutive legs

- CEPAC questioned whether adequate site survey data was available to choose sites for drilling on Ontong-Java Plateau. LITHP indicated that better sites survey information (especially deep reflection data) was clearly needed, but so little is known about the crust forming oceanic plateaus that a hole almost anywhere would be useful.

- E. Davis asked if LITHP was concerned with vertical tectonic motions (eg. sea level changes, thermal evolution of old lithosphere). LITHP indicated it was, but felt it was the primary responsibility of the TECP panel.

- R. Larson asked if either CEPAC or LITHP was interested in oceanic fracture zones. LITHP indicated it was, but did not rate this theme highly in the Pacific since it thought this problem was better addressed in the North Atlantic. It was also noted that fracture zones should be part of TECP's interests.

At the conclusion of the joint session, the panels resumed their separate meetings. The consensus was that the joint meeting had been useful.

6.0 WPAC Prospectus and PCOM evaluation

P. Robinson reviewed for LITHP the PCOM evaluation of the 3rd WPAC prospectus (see Appendix B). PCOM has asked for LITHP input on four questions: (1) Geochemical reference holes, (2) Bonin drilling, (3) Mississippi Valley Deposits proposal (Great Barrier Reef), and (4) Lau Basin.

6.1 Geochemical Reference Holes

PCOM has requested that LITHP provide the minimum strategy necessary for obtaining reference hole(s) for the Bonin system and a justification for the proposed drilling.

LITHP believes drilling crustal holes outboard of the arcs in the western Pacific can address a variety of objectives emphasized in the LITHP White Paper and by the COSOD II document. These objectives are:

(1) to determine the composition of sediment and igneous crust being circulated into the mantle at subduction zones;
(2) to test whether there is any correlation between the composition of the subducting plate and the compositions of neighboring arc volcanics;
(3) to investigate the temporal and spatial variations in the composition of the igneous crust;
(4) to compare the style of alteration and fossil hydrothermal activity in old fast-spreading with that observed in old slow-spreading crust, and inferred in young fast-spreading crust;

(5) to determine the physical processes responsible for the observed seismic velocity structure and magnetization of crust produced at a fast-spreading ridge.

The term, "geochemical reference holes," connotes objectives (1) and especially (2), but the priority LITHP places on such holes is based on the entire suite of objectives. To achieve these objectives it is necessary to drill at least one hole with deep (>200 m) basement penetration, and in addition to drill several shallower holes along the length of an arc system that shows substantial variation in chemistry. These holes should penetrate some tens of meters (preferably 50 m or more) into basement. Ideally, such drilling should take place in a variety of settings where different sediment types are involved, where the crust being subducted is of different ages (states of alteration), and was produced at different spreading rates. In this context, the western Pacific is of clear importance - it is old and fast spreading, and has a relatively thin veneer of old sediments. Drilling here would thus be a first step in achieving the longer-term objective of defining the global geochemical cycles associated with plate tectonics.

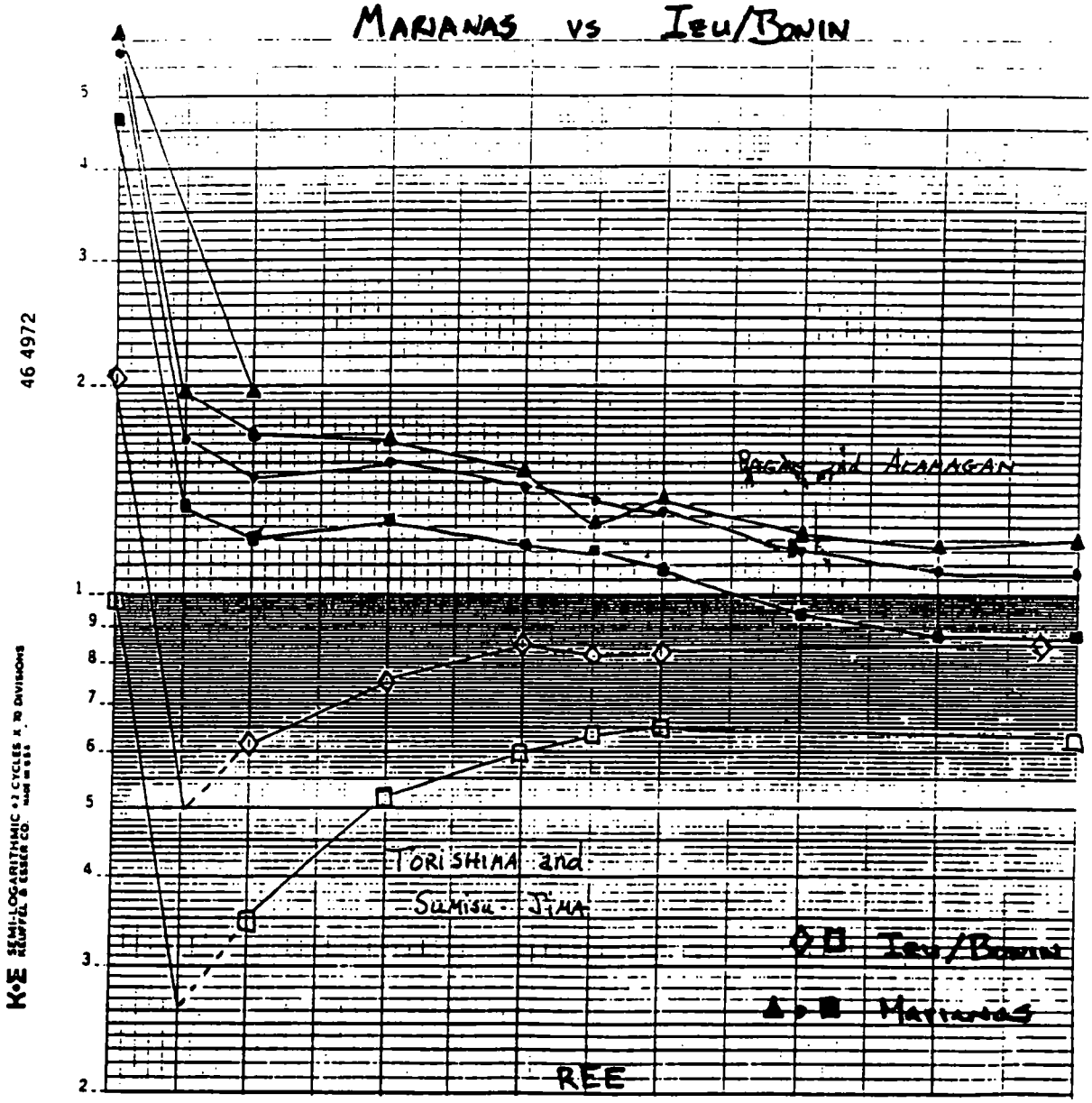
Why is it necessary to drill a deep hole?

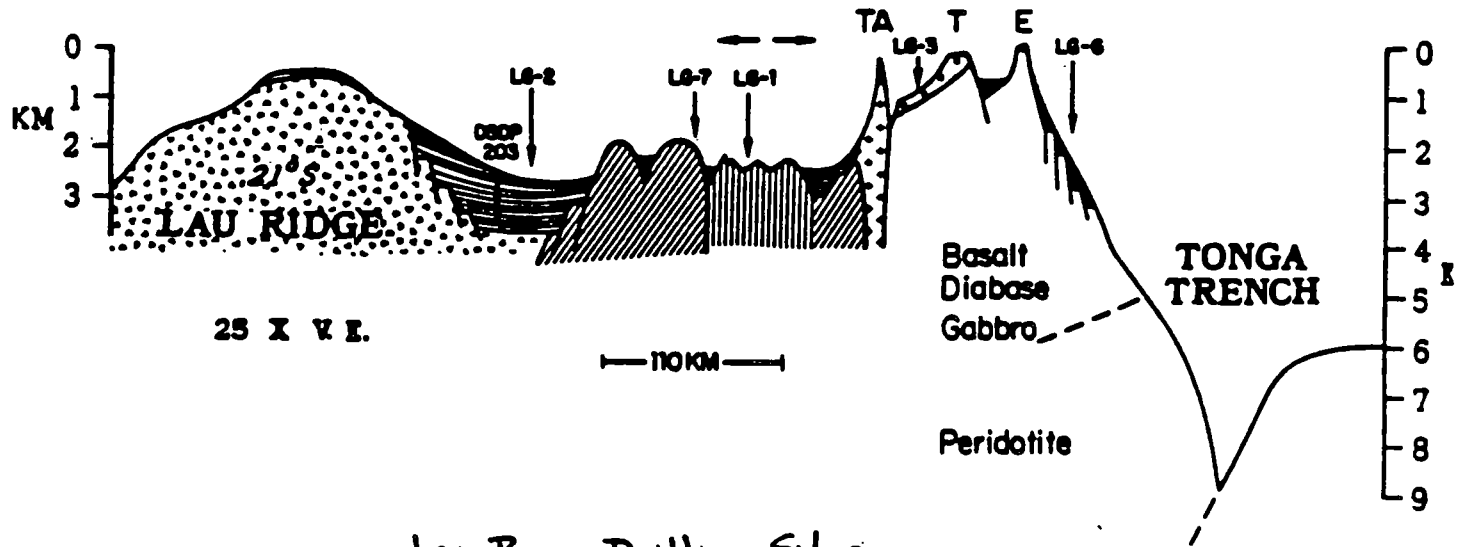
There are three major reasons for obtaining reasonably deep holes into old ocean crust:

(1) **to obtain samples of the crust after it has undergone the full complement of high and low temperature alteration.** This is important for two main reasons. First, altered crust is likely to be an important source of incompatible elements in the down-going plate, and we need to know what the concentrations of the pertinent elements are and how they vary with depth in the crust. Because nonoxidative alteration can lead to K-poor alteration assemblages, a serious question exists concerning to what extent subducting crust is a source of LIL elements for arc magmas. Second, the composition of old crust provides an essential constraint on models of the chemical fluxes between ocean crust and seawater. Fluxes based on hot-spring data alone are insufficient to describe the total exchange between basalt and seawater because of the importance of low-temperature off-axis circulation. The petrographic, chemical and isotopic record contained in drill cores of mature ocean crust will provide the key to the timing, processes and chemical exchange in the oceanic crust.

(2) **to determine variations in initial crustal composition.** There is an increasing body of evidence that even "normal" ocean crust has mappable differences in composition from ocean basin to ocean basin that provides constraints on the temperature of the mantle from which it was formed. Ultimately, these variations in the composition of ocean crust will provide important constraints on mixing and convection in the mantle. Old Pacific basement is clearly an essential data point required for this kind of analysis. But it can only be obtained by drilling, and only by drilling deep enough into the crust that one can be sure basement has been reached and samples are obtained from below the upper, most altered zone.

(3) **to ground-truth the seismic and magnetic structure of fast-spreading crust.** This was a prime motivation for DSDP crustal drilling in the eastern Pacific which, with the exception of Hole 504B, has been largely unsuccessful. However, this objective remains important, especially with





Lau Basin Drilling Sites
(from WPAC Prospectus)

recent advances in seismic acquisition and processing techniques which promise to significantly improve our ability to map structures within the crust. Drilling older crust, which has been altered and sealed by hydrothermal mineralization, may be a better place to attack these problems than young crust. In this sense, the holes we are proposing here tie in with the proposals to drill Mesozoic and Jurassic-aged crust in the western Pacific (285E, 287E).

Why is it necessary to drill more than one hole?

It has long been clear that the subduction of lithosphere is intimately connected to arc volcanism. What remains unclear is to what extent subducted crust is a chemical source of these volcanics. Some workers have suggested there is almost no input from the down-going plate; others maintain that the down-going plate is almost the only source; and still others suggest that the subducting plate contributes material only through metasomatic transport caused by dewatering of hydrous phases. If subducted crust and sediment contribute to arc volcanism, we would expect some correlation between the composition of the material being subducted and chemistry of the arc volcanics.

One approach to this problem (emphasized by TECP) is to choose an arc with substantial along-strike variations in arc chemistry and see if there are corresponding variations in the composition of the down-going plate. Because we can't drill the material immediately beneath the arc, the area chosen should display persistent differences in the subducting plate along the arc. The Bonin/Mariana arcs are just such a system. The islands in front of the Izu-Ogasawara arc consist of "island arc tholeiites" and their differentiates, rocks with very low concentrations of barium and potassium, and a marked depletion of the lightest rare earth elements. In contrast, the Mariana arc, which is the southern extension of this same system, have flat to enriched rare earth element patterns, and Ba contents are 100 ppm or greater (see attached figure).

The distinctly different compositions of the Bonin and Mariana arc volcanics thus provide an ideal natural laboratory to investigate the role the composition of the subducting crust and lithosphere play in creating these differences (seamounts, for example, are much more common outboard of the Mariana arc than the Bonins). However, this requires holes in both arcs to sample the representative components of the subducting lithosphere in each area.

One argument apparently raised against investigating this problem in the Bonin/Mariana area is the supposed lack of sediment influence on the arc volcanics, as suggested by studies of radiogenic isotopes and ^{10}Be. The panel discussed this argument and concluded it was flawed for two reasons. First, post-Cretaceous sedimentation in this part of the western Pacific has been very low and the Mesozoic sediments contain no ^{10}Be. Thus the absence of ^{10}Be in the arc volcanics does not resolve the question of whether the sediments influence arc volcanism. Second, the isotopic characteristics of old Pacific crust is completely unknown so the lack of a ^{10}Be anomaly provides no constraint on the crustal contribution to arc volcanism.

Recommended drilling strategy

LITHP believes a minimum drilling strategy for a reference hole program in the western Pacific is one deep hole outboard of the Bonins and three shallower holes near the Mariana transect of legs 59 and 60.

The deep hole, our highest priority, would be BON-8, on M-series anomalies (M-15) on the eastern end of the Bonin transect (the location of this hole could be adjusted to satisfy some of the requirements of the Handschumacher et al. proposal on the M-series lineations). This would be a re-entry site with the aim of at least 200 m of basement penetration. The three holes outboard of the Marianas are proposed for the area surveyed for DSDP Leg 60. Site MAR-4 would complete the transect of the Mariana arc carried out on Legs 59 and 60, and would be sited near Hole 452 on anomaly M-25. The objective of this hole is to sample the composition of the sediments entering the Mariana trench. MAR-5 would sample the distal portions of the volcanoclastic apron of the large seamount northeast of Hole 452, and hopefully penetrate into the oceanic crust below. MAR-6 would penetrate the summit region of the same seamount, or into a near-summit sediment bench, to sample shallow water sediments likely to be a significant component of thicker portions of the proximal sedimentary apron and Cretaceous ocean-island basalt beneath. The success of the program is critically dependent on solving the chert problem.

This program will require 1 1/2 legs of drilling. If only one leg were available for reference hole drilling, BON-8 followed by one of the Mariana holes would be our top priority.

6.2 Bonin forearc drilling

PCOM has approved a 1 1/2 leg Bonin I program consisting of sites BON 1, 2, 5a, 5b and 6. It has asked both LITHP and TECP for scientific objectives that can be addressed by an additional half leg of drilling in the Bonins, especially the question of drilling diapirs and/or the forearc terrace.

The panel discussed memos that Brian Taylor and Patricia Fryer had prepared on the scientific justification for drilling forearc diapirs in either the Marianas or Bonins. It was agreed that drilling a forearc diapir would provide unique information, not easily be obtained by surface sampling, on:

(1) the compositional variability of the fluids within the serpentinite matrix and their origin (dewatering of the down-going slab or compaction and desiccation of the sedimentary section).
(2) the compositional variability of the matrix material.
(3) the potential for ore deposition within the diapir.
(4) the mechanical properties and uplift history of the diapir.

The information obtained from this drilling will be important for understanding the geochemical mass fluxes associated with the subducting lithosphere and thus is closely tied to the "reference hole" drilling that has been strongly advocated by LITHP.

Although the value of drilling forearc diapirs is clear, the panel reiterated its earlier position that drilling the forearc terrace adjacent to these diapirs is of the same, if not greater, importance. The nature of the material comprising the forearc terrace is still very poorly understood and can only be sampled at depth by drilling. Its mechanical properties will provide an important control on forearc diapirism, and the unroofing history of the diapir recorded in its sediments

may provide better constraints on the uplift history of the diapirs than drilling directly into the diapir itself.

The panel next turned to considering whether this drilling should be carried out in the Bonins or Marianas, or in both areas. The best-studied diapirs are Conical and Pacman seamounts in the Marianas; it is not certain the domes seen in the Bonins are serpentinite diapirs, although dredge samples show evidence of hydration consistent with fluid invasion of the outer forearc. On the other hand, the structural setting of the outer Bonin arc is better known from MCS data. A final consideration was potential differences in the kind of diapirism in the two areas. The Bonin "diapirs" form on the lower slope terrace and are consistent with hydration of the outermost toe of the overriding plate by low P-T dewatering of the sedimentary section and possibly the upper portion of the oceanic crust in the down-going plate. The Mariana diapirs, on the other hand, are actively venting fluids that indicate they are derived from the subducting plate and/or mantle by massive segregation of serpentinite, and have risen through significant crustal and mantle overburden. Based on these considerations the panel made the following recommendation:

Recommendation

LITHP recommends a half-leg be devoted to drilling a forearc diapir and the adjacent forearc ridge in one arc, rather than drilling diapirs in two different arcs. The panel endorses drilling Conical seamount (MAR-3) and an adjacent forearc site in the Marianas as its highest priority. Diapirism is best documented at this site and drilling the adjacent forearc ridge will complete the Leg 59/60 Mariana transect. BON-7 is an important, but lower priority target, that should be drilled if time is available.

6.3 Evaluation of Mississippi Valley deposits proposal

LITHP has been asked to evaluate the Mississippi Valley Deposits proposal (268/D) for PCOM.

S. Scott summarized the proposal. Mississippi Valley-type deposits are carbonate-hosted lead-zinc deposits that are very important sources of base metals in North America and Europe. Northeast Australia appears to offer a close analogue to these deposits in a modern reef environment. The proponents argue that data from these holes could yield useful information regarding early carbonate diagenesis, chemistry of pore fluids, H_2S generation, chloride solutions, aquifer dynamics and metal source-sediment chemistry. Two of their proposed sites can be "piggy-backed" on SOHP proposed sites, but they require an additional half-leg to drill two additional sites.

- there was general agreement that this is a fundamental problem in ore genesis and that by drilling on the GBR much could be learned about the depositional history and early diagenesis of potential host rocks for these kinds of deposits.

- questions were raised about the lack of a true transect and what this would mean in terms of determining the aquifer dynamics and variations in fluid chemistry; also concern was expressed about what could be

learned about metal source-sediment chemistry if the ore deposits are not now actively forming.

- H. Elderfield noted that problems exists with present fluid sampling capabilities within ODP; significant improvement in pore fluid sampling techniques would be required for this program.

- J. Malpas commented that many of the objectives here are related to carbonate diagenesis and deposition and should be evaluated by SOHP.

- finally, there was discussion about the minimum drilling program needed to adequately address this problem - four holes?, three?; another attempt should be made to select sites that would satisfy this program as well as SOHPs other objectives in this area.

Recommendation

The Mississippi Valley deposits proposal addresses important scientific questions related to the formation of carbonate-hosted lead-zinc deposits. However, this program is not central to LITHP thematic objectives, either globally or in WPAC. We suggest additional efforts be made to integrate this work with SOHP objectives in the area, but in terms of an extra half-leg, reference hole drilling and forearc diapir drilling are higher priorities for LITHP.

6.4 Lau Basin

PCOM has asked LITHP to formulate two scenarios for a single leg of drilling in the Lau Basin, one with and without bare-rock drilling, and to describe the scientific objectives and relative merits of each.

Scenario 1 (without bare-rock drilling)

LG-2 is LITHP's highest priority in the Lau Basin in this scenario. Drilling at this site will: (1) document the basement age of the basin margin at 18°S, with implications for the age of initial basin formation and comparison with (coeval?) activity on the Lau Ridge, (2) provide a sediment section for evaluation of the rates of subsidence and hydrothermal input in the evolution of the basin margin, and (3) sample the oldest lavas erupted in the basin to test models of chemical heterogeneity in the development of the basin. A moderately deep, re-entry hole (>200 m) below basement is required to adequately address the heterogeneity question. Coring of the oldest sediments will satisfy the unreached objective of DSDP Hole 203, and provide the critical age data. Coring of the entire sediment section is necessary for a temporal analysis of arc and hydrothermal inputs.

Our next highest priority is LG-3 on the Tonga platform near 22°S. This hole has a clearly defined drilling target (Unconformity A) that will yield information on the age of inception of back-arc opening, as well as the vertical tectonic history of the arc prior to rifting. Comparison of the opening rates at LG-2 and LG-3 will provide information on the age progression, if any, in the opening of the basin from 18-22°S.

Sites LG-7 and LG-1 are nearly at the same latitude as LG-2 and would sample younger crust within the basin. Drilling at these sites will be useful in evaluating the local heterogeneity of basement lavas, and the nature of the transition from "Mariana Trough"-type to MORB

lavas. We would favor drilling one of these holes (probably LG-7) relatively deep (ie. as a re-entry hole), rather than two shallow holes, to document local heterogeneity which is a prime LITHP objective at these sites.

We have not included LG-6 in this scenario since PCOM has directed us to focus on back-arc processes. However, LITHP has consistently rated LG-6 highly, especially for the information it could potentially provide on the history of the arc and the composition of pre-Lau Basin volcanic basement in the forearc. We thus recommend LG-6 as a high-priority back-up site, especially if drilling young crust at LG-7 or LG-1 proves technically unfeasible.

Summary: In this scenario we endorse a one-leg program consisting of, in order of priority, LG-2, LG-3 and LG-7 or LG-1. LG-2 should be drilled at least 200 m sub-basement; LG-3 must be drilled to unconformity A. LG-6 is a high-priority back-up site. None of the holes require bare-rock drilling.

Scenario 2 (bare-rock drilling)

Presently, the best-documented spreading axis in the Lau Basin is between 18-19°S, in the vicinity of LG-1, and if we had to recommend a bare-rock site it would be in this area (final site selection should await detailed surveys yet to be completed). Drilling at or near the rise axis in this region would provide samples from medium spreading (50-60 mm/yr) back-arc crust. Dredging indicates the surface lavas are normal MORB, but it is possible other lavas types with particular back-arc characteristics may be encountered at depth. Valu Fa is a potential alternative bare-rock site which would sample highly differentiated (andesitic to dacitic) lavas and related hydrothermal mineralization (von Stackelberg has proposed two sites: LG-4B and LG-4C). We, however, would favor LG-1 since the highly acidic, brittle Valu Fa lavas are likely to be extremely difficult to drill and the northern Lau Basin is more typical of back-arc magmatism.. It is conceivable that devoting one leg entirely to bare-rock drilling at either of these sites would yield no new information on back-arc magmatic processes. Therefore, in this scenario we recommend at least 1/2 leg be devoted to drilling at LG-2.

Summary: Top priority for bare-rock drilling should be on- or near-axis between 18-19°S, however at least 1/2 leg should be devoted to drilling at LG-2.

Discussion

Of these two options, LITHP unanimously endorses the first scenario. At the present time, there is not, in our opinion, strong scientific justification for an extensive program of bare-rock drilling in the Lau Basin (nor has either LITHP, WPAC or the Lau Basin Working Group previously recommended bare-rock drilling in the Lau Basin). Drilling at LG-2, LG-3 and either LG-7 or LG-1 offer excellent opportunities for studying back-arc accretion and magmatic processes without bare-rock drilling. However, there is a strong engineering justification for field tests of the new hard-rock drilling systems, including a modified guidebase design, under development for EPR and other CEPAC drilling. The Lau Basin is an ideal site to test this equipment and LITHP strongly endorses an "engineering" leg devoted to this purpose. However, LITHP believes this

engineering testing should be separate from, and in addition to, one leg of scientific drilling in the Lau Basin.

We thus make the following recommendations:

Recommendations:

(1) A one-leg program of scientific drilling should be devoted to back-arc processes in the Lau Basin. The highest priority sites are LG-2 in the western Lau Basin which should be drilled to a least 200 m sub-basement, LG-3 on the Tonga platform which should be drilled to Unconformity A and LG-7 or LG-1. None of the sites require bare-rock drilling.

(2) A separate engineering development leg should be approved for Lau Basin to field test new hard-rock drilling and coring systems under development for CEPAC drilling. Final site selection should be based on engineering requirements, but sites on- or near-axis between 18-19°S would be our first choice, with LG-4B or LG-4C on Valu Fa ridge as potential alternative sites.

7.0 Other Matters

7.1 Next meeting

The next LITHP meeting was tentatively scheduled for March 1-3, 1988 in Hawaii with John Sinton serving as host. The meeting will be either held at Volcano House or on the Hilo campus of the University of Hawaii.

7.2 Panel Membership

The panel was pleased to welcome Harry Elderfield (the long awaited replacement for Margaret Leinen) to LITHP and was informed that Larry Cathles will join the panel in March as a replacement for John Delaney. Three U.S. LITHP members are rotating off the panel effective Jan. 1, 1988: John Sinton, Charlie Langmuir and Jim Hawkins. The panel felt at least two of the new replacements should be petrologists to maintain the panels strength in this area. Nominees were (in preference order): Dave Clague (USGS), Bill Bryan (WHOI), Jim Natland (SIO) and Mike Perfit (Florida). The third replacement could be a geophysicist and John Orcutt (SIO) and Norm Sleep (Stanford) were nominated. Jim Hawkins agreed to remain on the panel longer if necessary.

The Chairman thanks John, Charlie and Jim for their long and devoted service to LITHP. They will be hard to replace.

7.3 Formation Microscanner

J. Picard made a brief presentation to the panel on the Formation Microscanner (FMS), a new tool developed by Schlumberger which the Borehole Logging group would like to acquire for ODP. The FMS provides two-dimensional resistivity images of the borehole wall and has a resolution of about 0.1 cm. It can clearly define fractures, foliation planes, brecciated regions, breakouts, and contacts. Since its spatial orientation can be determined with 3-axis accelerometers and flux-gate magnetometers in the tool, it can record the strike and dip of these features. The current version of the tool is too large to be used in ODP; a slimmer

version of the tool would cost about $160,000 over two years. DMP has listed the FMS as its highest priority acquisition for 1988. Although originally designed for use in sediments, it appears that it will be valuable in crustal holes as well. Questions were raised as to whether the modified FMS tool will fit in the smaller diameter holes envisioned with the new mine coring system under development at ODP. Assured that the answer to this was yes, the panel gave its endorsement to the acquisition of this new tool.

* * * * *

The meeting officially adjourned at 3:10 pm on 1 Oct. The panel thanked Catherine Mevel and Jean Francheteau for hosting an enjoyable and productive meeting.

NOTE:
Appendices are not included to save paper.
known to PCOM as it is composed of documents

SECOND CEPAC PROSPECTUS

(Prepared October, 1987)

Preface

This Second CEPAC Prospectus replaces the First Prospectus for Central and Eastern Pacific Drilling that was presented to PCOM at the Jan. 1987 meeting in Hawaii (see attachment no. 5).

CEPAC wishes to remind the PCOM and other planning groups that the region assigned to CEPAC is the largest in the world, with consequent port call and steaming time problems, and contains arguably the most diverse set of geologic provinces and problems of any assigned region.

The plate configuration and motion history remains enigmatic over large parts of the Cretaceous and Jurassic Pacific. Locations and paths of hotspots and the history and petrologic implications of off-ridge, mid-plate volcanism are poorly defined. The stratigraphic record from pre ~M-0 time to the present has been poorly sampled leaving a host of paleoceanographic questions to be addressed. MOR processes and products is a field that has only been scratched. The vertical tectonic history of the western portion of the region does not fit easily into subsidence models; the geological and geophysical information contained in seamounts, guyots and their capping sediments remains largely untapped. The world's largest and most diverse set of convergent boundaries with their tectonic, sedimentologic and geochemical histories only vaguely known border the region. An 18 month drilling program could be devoted to any one of these thematic problems.

This Second CEPAC Prospectus is based on the Panels' deliberations up to and including the combined CEPAC-LITHP meeting held in Paris, Sept. 29-Oct. 2, 1987. It was prepared following the new PCOM instructions contained in letters from the PCOM Chairman to the CEPAC Chairman (Pisias to Schlanger, Sept. 2, 1987) and from the PCOM Chairman to the Panel Chairmen (Sept. 2, 1987). At the Paris meeting CEPAC had in hand, for the first time, well-defined lists of priorities, themes and associated proposals from all three thematic panels; LITHP, TECP, SOHP (see Attachments, nos. 2, 3, 4).

At the Paris meeting, CEPAC discussed new proposals received since the CEPAC meeting at Northwestern University, March 30-31, 1987, but did not assign numerical ratings to them as had been done previously (see attachment no. 1).

The proposals that CEPAC believes best address the objectives of the thematic panels (augmented by CEPAC judgement) are presented as "abstracts" that contain material on: (1) Scientific Rationale, (2) Maturity, (3) Adequacy of Documentation, (4) Drilling Time, (5) Probability of Success. These abstracts are not meant as substitutes for the full proposals. A more mature Prospectus, the third, will be presented at the PCOM spring meeting in late April, 1988, following the next CEPAC meeting scheduled for Feb. 10-12, 1988, in Menlo Park.

Contents

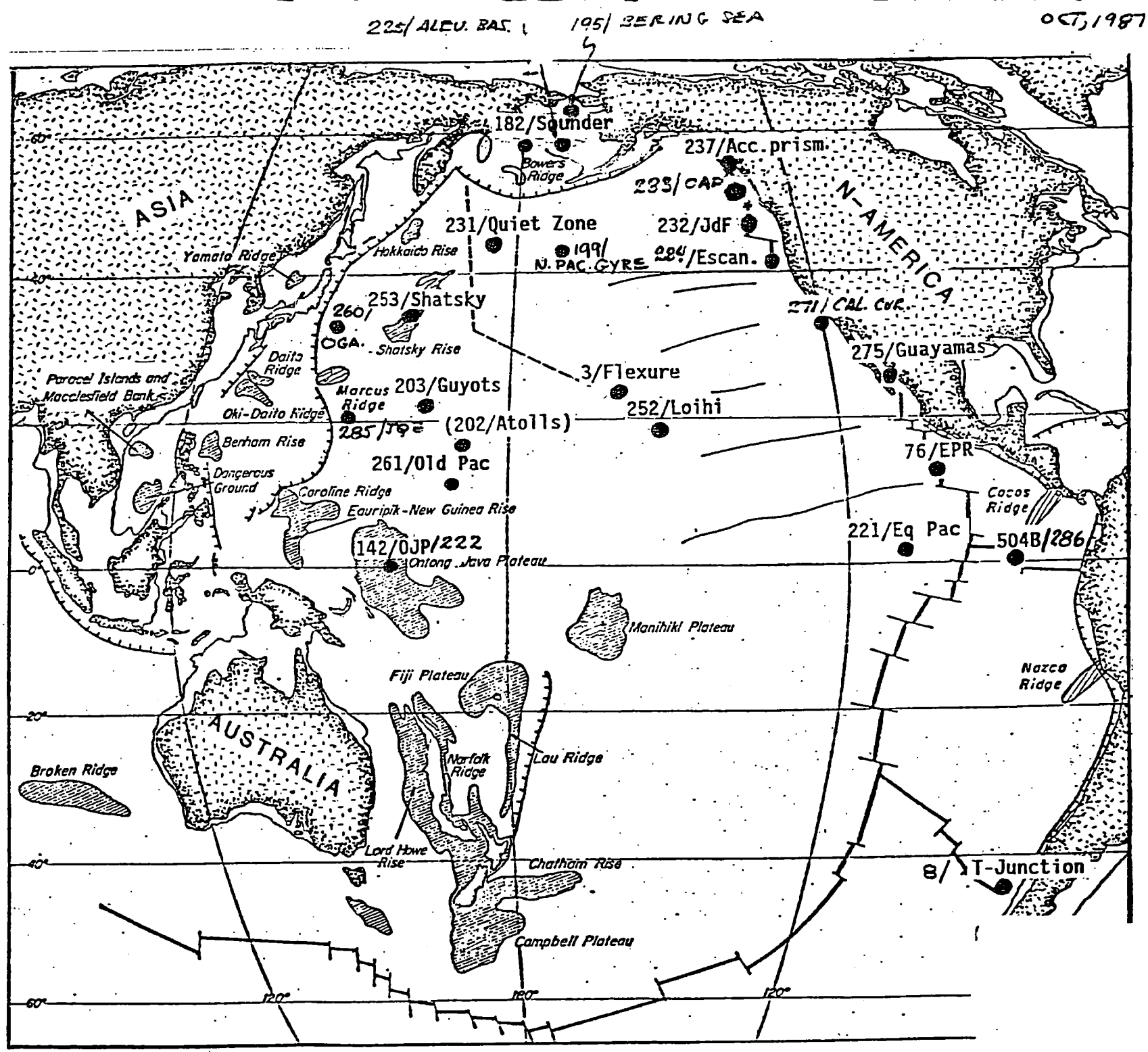


FIG. 1 CEPAC DRILLING PROGRAM - PROSPECTUS 2

CEPAC Prospectus

Theme: Neogene Paleoceanography

Panel: SOHP

Proposal: 142/E: Ontong-Java Plateau, Equatorial Pacific depth transect. (Mayer & Berger)*

Rationale: In the past few years it has been demonstrated from the equatorial Pacific that acoustic reflectors in carbonate sequences can be isochronous horizons denoting paleoceanographic events. The Ontong-Java plateau displays similar reflectors within its thick carbonate cap. It is proposed to test this concept on the flank of the OJP by coring the pelagic sequence along a depth transect at sites linked by seismic reflection profiles. The depth transect will provide the Neogene (and earlier) history of the CCD/Lysocline in the west Pacific. Logging will permit construction of synthetic seismograms - an important link between borehole lithology and acoustic stratigraphy.

Maturity: This is a well thought out proposal that applies proven techniques to a region of great paleogeographic importance. Sediments of the OJP record the western portion of the Pacific equatorial productivity zone and, together with information from the central and eastern Pacific will provide a basin-wide view of equatorial processes.

Adequacy of Documentation: Sites 289 and 586 have already been drilled in the area. The requisite geophysical surveys, especially seismic (SCS digital) profiling, have been funded by NSF and will be conducted in Nov. 1988. No problems are envisioned in this regard.

Drilling Time: Roughly one leg will be required for this effort to drill a depth transect across the plateau. The proposal in hand does not detail the number of sites but several to a sub-bottom depth of 1,000 m will be needed.

Probability of Success: Recovering HPC cores from the OJP and drilling deeper should present no problems to the *Resolution*. The probability of success is considered very good.

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* See also 222/E and addendum. Both of the OJP proposals might be packaged in a 2 leg program.

CEPAC Prospectus

Theme: Structure and Magmatic Evolution of Plateaus

Panel: LITHP

Proposal: 222/E and addendum, "Ontong-Java Plateau: Origin, Sedimentation History, and Tectonic Processes" (Kroenke et al.)*

Rationale: Plateaus are important but poorly understood features of the Pacific basin. Diverse origins have been postulated for these features, including off-ridge volcanism — even fragmentation of continents. In turn these features may become accreted to continents; complete with their sedimentary caps. The origin and magmatic evolution of these features is a basic question of Pacific marine geology.

A. Maturity: The proposal presents a well-thought-out approach to determining the age and nature of the surficial volcanics on this largest of the Pacific plateaus. Holes are sited on the top and flank of the OJP and positioned to test a proposed age differential, older to the north, across the plateau. The proposed sites should return ample material to determine the nature (MORB-Island-Granitic continent) of the basement, and with deeper penetration, aspects of later-stage magmatic evolution. Sites were also chosen to lie beneath moderately thick sedimentary sections that should provide a paleoenvironmental history of the equatorial and subtropical Pacific.

Adequacy of Documentation: The sites presented were chosen on the basis of single-channel air-gun lines. The panel felt that better reflection data (MCS if possible) and some better assurances of avoiding basement heterogeneities, perhaps magnetic-anomalies information, would be important to the ultimate choice of drillsite. The proponents appear to be aware of survey needs, but as of this date funding has not been forthcoming.

Drilling Time: Five sites (and one alternate) are proposed, two re-entry holes and three single-bit sites. The site summary forms indicate a total of 4300 m of sediment 1000 m of basement at these five sites. This amount of drilling, plus logging at each site, will require at least one full leg of drilling time and possibly two.

Probability of Success: Drilling on OJP with good sediment recovery has always gone well, so no unusual problems are expected at these sites. The "chert problem" is not as severe here as on Shatsky Rise and other places farther north. The probability of success of this proposal is very good.

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* See also proposal 142/E. Both OJP proposals may become a package of 2 legs.

CEPAC Prospectus

Theme: Old Pacific

Panel: SOHP, TECP

Proposal: 261/E: History of the Mesozoic Pacific Ocean: Jurassic-Cretaceous sediments, volcanics and crust related to paleoceanographic, tectonic and lithospheric adjectives (Larson and Lancelot)*.

Rationale: Upper Jurassic to Lower Cretaceous sediments have not been adequately sampled from the Mesozoic "Super-Ocean". Attempts to drill such sections in the oldest part of the Pacific Basin in the region of the Nauru, Mariana and Central Basins have been frustrated by a thick Cretaceous volcanic cover. The main objectives are the recovery of Upper Jurassic-Lower Cretaceous sediments and biota and the dating of volcanic episodes in the western Pacific. Another objective is the recovery of basement rocks for petrologic and geochemical studies.

A. Maturity: This is a completely mature proposal interms of the conceptual framework based on drilling at Sites 462 and 585 and numerous marine surveys and dredging of seamounts in the western Pacific.

B. Documentation: In addition to the sections already drilled and the site surveys on which the drilling was based, the N/O Charcot has acquired MCS lines across the Nauru Basin across the Marshalls and along a N-S line on the east side of the Marshalls north past Site 169. The R/V F. Moore will, in the fall of 1987, conduct air-gun sourced MCS in the Mariana Basin and to the NW in the M-30 series in the area of proposal 285/E. Documentation is considered to be adequate on successful completion of these surveys.

C. Drilling Time: A complete leg will be needed for adequate penetration in 5 to 6 km water depth.

D. Probability of Success: Success will depend on results of R/V F. Moore survey in identifying a "window" through the Cretaceous volcanic section. Operationally, with the drilling capability of D/V Resolution, The proposal has prospects for a reasonable degree of success.

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* See also proposal 285/E

CEPAC Prospectus

Theme: Old Pacific

Panel: TECP, LITHP, SOHP

Proposal: 285/E Deep Drilling in the Jurassic Quiet Zone, Western Pacific (Handschumaker et al.)*

Rationale: A swath of crust between 19°-26°N and 145-155°E in the northwest corner of the Pacific has been found by aeromagnetic surveying for which magnetic lineations continue out beyond the M-29 to the M-38 anomaly. The objectives of 6 proposed sites JJ1-JJ6 are: 1) to study crustal magnetization, geomagnetic reversals and absolute plate motion; 2) establish a pre-subduction geochemical reference section; and 3) to study the presumably oldest sediments and paleoceanography of the Jurassic section.

A. Maturity: This is a conceptually mature proposal based on previous drilling in the Nauru Basin and the aeromagnetic mapping of the M-30 series.

B. Documentation: At this time the documentation rests solely on the aeromagnetic surveys that have defined the M-30 series and old (1979) airgun reflection profiles and sonobuoy and refraction stations. The R/V F. Moore MCS surveys to be conducted in the fall of 1987 will cover part of the area.

C. Drilling Time: Considering that JJ-5 is the highest priority site of the 6 proposed because it is on the oldest surviving Pacific crust and is programmed to penetrate 550 m of sediment and 500 m of basalt in 5700 m of water it is expected that 1 leg could do this site and *possibly* a second site.

D. Probability of Success: If a Cretaceous volcanic cover is present as at Site 462 the probability of success is only moderate. If new surveys indicate a "window" though the Cretaceous cover over the sediments that presumably directly overlie the "true plate" probability of success is improved to very good.

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* See also proposal 261/E

CEPAC Prospectus

Theme: Mesozoic-Paleogene paleoceanography; sea-level history; subsidence history; hot-spot track

Panel: SOHP, TECP(part)

Proposal: 202/E Marshall Islands: drowned atolls, archipelagic aprons, volcanic edifices related to paleoceanographic, lithospheric and tectonic objectives (Schlanger, for the USSAC Carbonate Banks Workshop).

Rationale: Eocene reefs on guyots in the Marshall Islands that occur next to extant atolls (paired atoll-guyots) pose fundamental problems as to the mechanisms of reef drowning and its relationship to volcanism, subsidence, rates of reef growth and sea-level change. This proposal seeks to shed light on these processes by drilling some key atolls and possibly uncovering not only Early Tertiary but also the Late Cretaceous histories of these edifices. Determining absolute ages and paleolatitudes of the guyots is thus an integral part of this project. Problems of carbonate diagenesis and palaeontological correlation between shallow water and pelagic sequences are secondary objectives.

A. Maturity: This is a well-formulated mature proposal that addresses fundamental geological problems that can only be solved in the Pacific.

B. Documentation: A site survey that will produce the requisite documentation: SCS, magnetics, gravity, SeaMARC and dredging of the drowned atolls has been funded and will be carried out in March/April, 1988. Current data include bathymetry, gravity dredge hauls, SeaMARC coverage and MCS of Harrie Guyot and SCS of Sylvania Guyot. Other drouned atolls revealed by the projected surveys may be added to or replace some of the Sylvania-Harrie series in the same region.

C. Drilling Time: This proposal could be accomplished with 46 days drilling time, with short transit times from Majuro to Majuro

Sylvania 1	7 days
Sylvania 2	7 days
Sylvania 3	9 days
Harrie Guyot	7 days
Harrie Guyot	7 days
Harrie Guyot	9 days

This constitutes one leg.

D. Probability of success: The probability of success for this proposal is judged to be high.

CEPAC Prospectus

Theme: Mesozoic-Paleogene paleoceanography; Pre-70 Ma absolute motion (part)

Panel: SOHP, TECP (part)

Proposal: 203/E Guyots in the central Pacific (Winterer et al.)

Rationale: Many western Pacific guyots, now lying at 1.8 km water depth, are Mesozoic volcanoes capped by drowned Cretaceous reefs. This proposal seeks to address the timing and amplitude of relative sea-level change and its relationship to the drowning of atolls at different paleolatitudes. Was drowning synchronous or not? The age of the seamounts would also serve to calibrate the motion of the Pacific Plate with respect to hot-spot volcanism. Petrological objectives on the seamounts, mantle heterogeneity, petrochemical evolution of lavas will also be addressed.

A. Maturity: This is a well-formulated and well-balanced mature proposal that addresses fundamental geological problems that can only be solved in the Pacific.

B. Adequacy of Documentation: A site survey to produce adequate documentation of the seamounts has been funded. Maps of the seamounts concerned already exist (e.g., Leg 20 data).

C. Drilling time: This plan could be accomplished in 33 operational days, from Majuro to Tokyo or vice versa.

Allison	10 days
Menard	5 days
Wilde	10 days
Makarov	4 days
Seiko	4 days

This constitutes one leg.

Probability of success: The probability of success for this proposal is judged to be high.

CEPAC Prospectus

Theme: Atolls and Guyots

Thematic Panel: SOHP

Proposal: 260/D: Evolution of old-Pacific seamount chain (Saito et al.)

Rationale: Ogasawara Plateau area consists of a series of topographic highs between the Ogasawara (Bonin) Trench and the Mariana Trench. Current hypotheses make the southern end a remnant of an older Plateau and the northern part of the western extension of the Michelson Ridge. These are interpreted to be offscraped remnants that have entered the subduction zone.

Main objectives are the recovery of Jurassic/early Cretaceous sediments on the Ogasawara Plateau and petrological samples from the ophiolitic igneous bodies in the Ogasawara (Bonin) forearc area.

Maturity: This is a mature proposal based on the knowledge newly revealed by recent geophysical and marine geological surveys and dredging. However, the objectives are diversified.

Adequacy of Documentation: SCS by Geological Survey of Japan and Ocean Research Institute, Univ. of Tokyo, and multi-beam sonar bathymetry by U.S. Naval Oceanographic Office are available. Well-documented data of gravity, magnetics, and petrology of dredged samples are available on the Ogasawara forearc area. MCS data is not presented at this time.

Drilling Time: At least two full legs will be needed for adequate drillings at 5 proposed sites.

Probability of Success: Paleoceanographic and tectonic objectives on the Ogasawara Plateau will be highly successful. However, 1000 m penetrations at two sites on igneous edifices in the Ogasawara forearc area may be very difficult to be achieved, although water depth is not so large, varying from 1300 m to 2500 m. It is suggested that the objectives be focused on the problems of evolution of old Pacific seamount chain and paleoceanography.

CEPAC Prospectus

Theme: Anoxia (Anoxic Events)

Thematic Panel: SOHP

Proposal: 253/E Paleoceanographic controls on the deposition of organic carbon-rich black shale in the ancestral Pacific: a proposal for a drilling transect on Shatsky Rise (Schlanger and Sliter for the USSAC Black Shale Workshop)

Rationale: Cretaceous black shales have been sampled from all major ocean basins, although the record, to date, from the Pacific is patchy and poorly dated. This proposal seeks to retrieve Cretaceous carbon-rich facies from three sites on Shatsky Rise representing different paleodepths in order to define the geometry of the oxygen-minimum zone and test the various models of black-shale deposition (preservation vs. productivity, influence of volcanism, climate) that have been suggested for these sediments. Exact dating of the carbon-rich intervals is thus a prime objective to see whether they fall in the window of so-called "Oceanic Anoxic Events".

Maturity: This is a well-formulated proposal that addresses the problem of Cretaceous black shales on oceanic plateaus, a problem that is best addressed in the Pacific.

Adequacy of Documentation: Survey data for these sites includes drilling results from Sites 47, 48, 49, 50, 305, 306, 577 and old air-gun seismic records. Such data are probably sufficient for the furtherence of this proposal. No site surveys are currently envisaged.

Drilling Time: This proposal could be accomplished with 40 days drilling time including re-entry and logging, to and from Yokohama.

SHAT-1 (30 00N; 157 50E) 15 days
SHAT-2 (32 25N; 157 12E) 15 days
SHAT-3 (32 25N; 157 05E) 10 days

This constitutes one leg.

Probability of Success: Given the previous history of drilling on Shatsky Rise, characterized by poor recovery because of the prevalence of Lower Tertiary and Cretaceous chert, a solution to the problem of drilling alternating hard and soft lithologies (e.g., chalk/chert) must be found before any deep coring on Shatsky Rise is attempted. In the absence of the requisite technology to deal with this problem, the probability of a successful outcome of a drilling leg in this region could be rated as very low.

CEPAC Prospectus

Theme: Neogene paleoenvironment; Cretaceous Quiet Zone

Thematic Panel: SOHP; TECP

Proposal: 199/E: Pelagic sedimentation in the North Pacific gyre (Janacek et al.)
Proposal: 231/E: North pacific magnetic quite zone (Mammerickx et al.)

Rationale: Cenozoic changes in surface water productivity and sedimentation in subarctic Pacific; Cenozoic history of eolian sediments; climatic evolution of late Neogene; chemistry of North Pacific Intermediate Water; plate re-organization during Cretaceous Quiet Zone. Two proposals address different objectives, but are located in same geographic area and could be accommodated in a single leg.

Maturity: The proposals describe significant problems in paleoclimate and tectonic studies, noting the inadequacy of existing material and data in the northern North Pacific. Problems are well-formulated; alternate interpretations are discussed and data required to resolve the problems are described. Objectives for drilling, and suggested sites for these objectives, are given. The proposals are scientifically (conceptually) mature.

Adequacy of Documentation: Proposals present the existing documentation, which includes regional bathymetry, single lines of 3.5 KHz and single-channel seismics, regional magnetics, and single piston cores. This documentation is not adequate for any of the sites. Additional 3.5 KHz and 100 Hz profiles are required, with track crossings. Multibeam bathymetry would be useful, but probably not necessary at most sites -- the exception would be a site(s) located on the Emperor seamounts.

Drilling Time: 8 sites, 3-4 days per site (=24-32 days) plus 15 days transit between sites = 39-47 days. Steaming to port on each end would require approximately 7-10 days, depending on port. Total: one full leg.

Probability of Success: HPC/XCB coring will recover late Neogene siliceous-terrigenous-eolian sequences: success high. Recovery of Neogene carbonate continuous sequence speculative: success moderately low. Recovery of Paleogene/Mesozoic sequences probable, but quality uncertain: success intermediate. Dating of basement for tectonic reconstruction depends on sediment quality: success intermediate.

CEPAC Prospectus

Theme: Neogene paleoceanography

Theme: Mesozoic-Paleogene paleoceanography

Theme: Anoxic events

Panel: SOHP

Proposal: 195/E: A preliminary proposal for Bering Sea drilling: Paleoenvironmental and paleoclimatic objectives. (Sancetta)

Proposal: 225/E: a preliminary proposal for drilling in the Aleution Basin, Bering Sea. (Cooper and Marlow)

Proposal: 182/E: Sounder Ridge, Bering Sea-Kula Plate-stratigraphy. (Taira)

Rational: Late Neogene high latitude oceanic and continental climate evolution; Paleogene-late Mesozoic North Pacific carbonate sedimentation; mid-Cretaceous black shales; Kula-Pacific plate reconstruction.

A. Maturity: These proposals are well focused and address important paleoceanographic and tectonic objectives. In combination, these proposals summarize well the present state of knowledge.

B. Documentation: Proposals lack detailed site specific documentation. One MCS line over Sounder Ridge is available from the USGS in addition to numerous single channel lines. Site specific surveys needed on Sounder Ridge. Umnak Plateau has numerous MCS lines and single channel lines.

C. Drilling time: Possibly one leg for two sites, one well into basement: timing needs further analysis.

D. Probability of Success: Very high for paleoceanographic objectives on Umnak Plateau. Sounder Ridge drilling is speculative and pending on well designed site location; but with potential for high scientific return; success could be enhanced by *new* site specific surveys; recently acquired seismic data available from the USGS might resolve problems of site location on Sounder Ridge.

CEPAC Prospectus

Theme: Development of the decollement zone at a thickly sedimented convergent margin

Thematic Panel: TECP

Proposal: 237/E: Northeast Pacific active margin off Vancouver Island (Brandon, et al.)

Rationale: Drilling is proposed concerning the physical and chemical properties and deformational characteristics of sedimentary units being transported landward beneath a decollement and deep beneath the subduction zone to regions where underplating takes place.

Maturity: Little factual information exists concerning the physical, chemical, thermal, and fluid state of rock masses involved in sub-decollement transportation at convergent marings. The drilling proposal is a mature description of a drilling plan to provide information concerning subdecollement processes and states.

Adequacy of Documentation: Multichannel reflection profiles document that a large clastic wedge, including a prominent decollement surface, underlies the Vancouver margin and extends landward roughly 100 km. Eocene exposures of older parts of the complex exist in coastal mountain belts. It seems likely that initial melange formation processes occur beneath the decollement beneath the frontal part of the wedge, which is well imaged on multi-channel data. Documentation of subdecollement drilling targets across the frontal folds of the accretionary wedge is thus available. A related scientific question concerns the structural growth of the frontal folds, which are controlled by thrusts merging downsection with the decollement. Additional site survey data may not be needed, but cross grid multifold profiles would be advisable.

Drilling Time: Two sites have been proposed in the frontal part of the Vancouver accretionary wedge. Estimated drilling and logging times are listed below.

Site	Water Depth	Subbottom Penetration	Drilling Time
VI-1	2480 m	1300-1500 m	12 days
VI-2	2080 m	1400-2000 m	15 days
Total			27

Probability of Success: Informal consultation with TAMU-ODP engineers implies that success is likely, provided that hole stability near or below the decollement is not a serious problem.

CEPAC Prospectus

Theme: Deformation in Accretionary Prisms

Thematic Panel: TECP/SOHP

Proposal: 233/E: Oregon accretionary complex (Kulm et al.)

Rationale: Drilling into the Oregon accretionary complex is proposed to study past and present fluid expulsion processes, paths, and effects in relation to specific structural and stratigraphic settings above a deeper-seated decollement.

Maturity: Scientific rationale is well focused, conceptually mature, and of current topical interest to a large community of scientists.

Adequacy of Documentation: Expulsion of pore fluids from the Oregon accretionary complex has been documented by bottom water and rock samples, submersible observations, and geothermal anomalies. Subsurface structure known from multichannel data and Leg 18 DSDP drilling. A traverse of 6 holes are proposed from the base to near the top of the margin. Good site-control information exists and has been summarized, including Seabeam, Gloria and submersible observations. Site survey data needed includes crossing-grid lines of multichannel profiles and advanced or research-level processing of existing and newly acquired data.

Drilling Time: Six sites have been proposed along a drilling transect; estimated drilling and logging times are summarized below.

Site	Water Depth, m	Subbottom Penetration, m	Drilling Time, days
OR1	2850	1000	9
OR3	2600	800	7
OR3A	2600	400	6
OR4	2150	1000	7
OR5	1950	800	7
OR8	247	300	2
Total			38

Probability of Success: Given reasonable hole conditions, the probability of success seems good.

CEPAC Prospectus

Theme: Magmatic and hydrothermal processes at sedimented ridge crests

Thematic Panel: LITHP

Proposal: 232/E: Juan de Fuca Ridge (Davis et al.)
Proposal: 275/E: Gulf of California; part 4 (Consortium)
Proposal: 284/E: Escanaba Trough, S. Gorda Ridge (Zierenberg et al.)

Rationale: The primary objectives of this drilling program are to characterize the physical and chemical nature of: 1) high-temperature fluid circulation within sediment-sealed oceanic crust, 2) the passage of fluids through the relatively impermeable sediment cover, and 3) the upper levels of "zero-age" crust in this environment.

Maturity: This represents a mature drilling program that focuses on a number of high-priority fundamental objectives as outlined in the proceedings of COSOD I and II and in the JOIDES lithosphere panel white paper.

Adequacy of Documentation: Three proposals fall under this theme (232E, Middle Valley, Northern Juan de Fuca Ridge; 275E, Part 4, Guaymas Basin, Gulf of California; 284E, Escanaba Trough, Southern Gorda Ridge). They differ in terms of the sites proposed and the details of the systems to be examined. At the present time, the hydrothermal situation at the northern Juan de Fuca Ridge is best characterized and provides the simplest example of a fully sediment "sealed" system. Crust beneath the sediments is ubiquitously hot (300-400 ° C), and high temperature fluids locally penetrate and escape through several hundred meters of sediment. Because of this simplicity, this site is favored for the drilling program, although further characterization of the other sites is strongly encouraged.

Drilling Time: Proposal 232E calls for two arrays of holes, one to penetrate undisturbed sediment cover and as deep into high-temperature basement as possible, and one to penetrate the sediments in the zone of fluid upflow and mineralization. This will require roughly 53 days of pre-drilling and drilling operations, logging, and transit time. Similar times would be required to carry out an adequate program at either of the other sites.

Probability of Success: The greatest problem anticipated in this program will be the high temperatures encountered in the sediments and crust. It should be possible to deal with this problem by simply increasing circulation rates. No other major problems are anticipated for the drilling phase of the program; however, it should be stressed that new capabilities for hole sealing, reentry, fluid sampling, and high-temperature logging will be required to optimize the results.

CEPAC Prospectus

Theme: Flexure of Lithosphere

Panel: TECP

Proposal: 3/E Flexural moats, Hawaiian Islands (Watts et al.)

Rationale: The objective of the proposal is to further our understanding of how the oceanic lithosphere responds to large surface loads. It is proposed to drill four sites in the broad depression flanking the Hawaiian Islands where existing geophysical data indicate the oceanic lithosphere is flexed by the weight of the islands.

A. Maturity: This proposal is very mature scientifically. The mechanical properties of the lithosphere can be constrained by theoretical models of transient flexure which satisfy observed moat stratigraphy. The key parameter in this problem is to provide a high resolution stratigraphy of moat sediments. This can be done if sediments can be dated with a resolution of 100,000 to 200,000 years.

B. Documentation: The surveys of the sites have been conducted with multichannel seismic reflection Common Depth Point (CDP) techniques. Additional high resolution seismic surveys using finely tuned arrays of the flexural moat are needed and have been funded in order to better define the stratigraphic sequences around each drill site.

C. Drilling Time: There is no indication of drilling time. It depends on the nature of the moat sediments. We assume that one leg could yield basement in all four holes.

D. Probability of Success: The key to this program's success, as recognized by the proponent, is the ability to date the material infilling the moat with a resolution of 100,000 to 200,000 years. This question has been raised by CEPAC and expertise has been sought from SOHP. A. Watts has responded to this. The sediments in the moat have been deposited during the last 2.6 my, the age of the oldest rocks on Oahu. The sediments are "well to poorly" stratified and consist of a variety of types (turbidites, volcanic flows, ash layers, pelagic material). Piston cores already available from the area show in the upper section of the column low coarse fractions and some carbonate. Coccoliths are present and could be dated to within 0.5 my. Diatoms may be present in Pliocene and older sediments. Probability of successful dating is weak at present even if the complete arsenal of techniques (tephrochronology, magnetostratigraphy, paleontology), is used.

CEPAC Prospectus

Theme: Early Magmatic Evolution of Hotspot Volcanism

Thematic Panel: LITH

Proposal: 252/E: Drilling Loihi Seamount (Staudigel et al.)

Rationale: Drilling Loihi Seamount is proposed as a means of studying magmatic, volcanologic, and hydrothermal processes associated with initial stages of midplate volcanism.

Maturity: The proposal is mature and presents a well-constrained drilling plan for studying incipient midplate volcanism, non-explosive seamount structure, and associated hydrothermal activities. Principal objectives are:

1. Stratigraphic sampling of initial stages of midplate volcanism to monitor chronologic relations of tholeiite and alkali lavas;
2. to study an active hydrothermal system in the pressure ranges at which seawater is boiling;
3. to identify the range of source compositions tapped by segregating magmas;
4. volcanogenesis of a non-explosive submarine volcano.

Two basement drill holes are proposed: a 300-400 m deep hole in the northern flat portion of the summit where hydrothermal activity is most intense, and a second shallower hole (100-300 m) on the north flank, where the edifice is thin and only alkalic lavas are found. Both sites require bare-rock drilling.

Adequacy of Documentation: The science background is well-referenced and site surveys are completed. High-resolution bathymetry and magnetics are available, dredge samples have been studied petrochemically, and submersible dived completed in Fall 1985.

Drilling Time: Depends on resolution of bare-rock drilling problems. If successful, 1 leg is envisaged to be adequate.

Probability of Success: Depends on successful bare-rock drilling; problems mitigated by abundance of vesicles. If drilling objectives are accomplished, "scientific" success is probably assured.

CEPAC Prospectus

Theme: Neogene paleoceanography

Thematic Panel: SOHP

Proposal: 271/E: Paleoceanographic transect of the California current. (Barron et al.)

Rationale: A detailed paleoceanographic transect of the California current system is proposed to understand Neogene spatial and temporal fluctuations in the strength of the current, the timing of its initiation, and the timing and evolution of seasonality effects within the system.

Maturity: Poorly focused proposal, numerous objectives are listed but with inadequate discussion and documentation. Relevance of individual sites to goals are ill defined. Proposal could be improved by a better justification of each site, by a better layout of sites emphasizing ocean current aspects. Proposal lacks information how material can be analyzed to answer questions.

Adequacy of Documentation: Poor, no seismic data presented, no individual site summary sheets. Survey status and need unknown.

Drilling Time: No estimates of drilling time contained in proposal. 8 sites proposed; estimated amount of time less than 1/2 leg if condensed and modified.

Probability of Success: The present layout of sites lacks cross current component to adequately address the spatial aspect of objectives. Proposal need modification, addition of cross current sites, thoughts as to reconstruct paleolatitudes, sedimentation rate calculations including statements as to completeness of record, resolution. A stronger justification for all proposed sites along current is needed.

CEPAC Prospectus

Theme: Neogene paleoceanography

Thematic Panel: SOHP

Proposal: 275/E; Part 5 only. Paleoceanography and depositional history: Drilling the Gulf of California (Consortium)

Rationale: High resolution time series of Quaternary climate and oceanography; dynamics of the oxygen minimum zone; sedimentation processes in the early stage of continental rifting; Neogene climate and ocean circulation; correlation of local record with regional/global trends.

Maturity: Numerous exciting objectives mentioned briefly but not adequately discerned. Proposal too optimistic as to number of objectives that can be achieved.

Adequacy of Documentation: None provided. DSDP-IPOD Leg 64 cited. Uncertain about present state of site specific survey and availability of lines.

Drilling Time: 8 holes proposed to be APC'd, total 7600 meters of expected core recovery. Estimate 25 days of drilling and transit time = 1/2 leg.

Probability of Success: If better focused some objectives can be achieved. As presently designed proposal is unrealistic. Proposal would be much stronger if more focused and number of sites is reduced.

CEPAC Prospectus

Theme: Magmatic and hydrothermal processes at sediment-free ridge crest

Thematic Panel: LITHP

Proposal: 76/E (revised): Axial and off-axial drilling of hydrothermal systems on the EPR at 12 ° 50'N (Hekinian and Francheteau)

Rationale: To enhance our knowledge of hydrothermal systems and related processes on a sediment-free diverging plate boundary region. The results will provide the possibility to compare with those expected from drilling hydrothermal systems in sedimented ridge areas.

Maturity: The idea of the proposal is very good; however, its presentation was felt not to be very mature. The conceptual part should be explained more in detail and focused more to the objectives.

Adequacy of Documentation: The site survey data presented are good and sufficient to support the proposed four drill sites of which three are rise axis targets, one is drilling on an off-axis seamount. It is, no question, one of the best surveyed areas of active and inactive hydrothermal fields on EPR. More than fifty submersible dives were performed together with deep-towed bottom photography, multi-channel seismic work and detailed bathymetric (Seabeam) and side scan sonar investigations (SeaMarc I). Multi channel seismic profiles show a continuous reflector about 2 km underneath the rise axis which may represent a magma chamber occurring in high position. Additionally, geoelectric measurements were carried out by submersible to measure the resistivity of the sulfides which helps us to judge the thickness of the deposit. Not very much is reported about petrological investigations. However, the proponents mention a high compositional diversity of the volcanics on both axial and off axial structures which may indicate mantle heterogeneities. Because of this diversity and because of the very large size of the hydrothermal deposit found at the seamount, drilling should be performed in axial and off axial areas.

Drilling Time: The proposed drilling penetration at 4 sites is 3 x 300 m and 1 x 500 m, in total 1,400 m. At the moment it is very difficult to calculate the time needed, but estimation is at least 3 legs.

Probability of Success: If technology of bare rock drilling is available the chance to solve the scientific goals seems to be very good. The probability of full success depends on getting information from a triangle of drill sites.

CEPAC Prospectus

Theme: Neogene paleoceanography

Panel: SOHP

Proposal: 221/E: Late Cenozoic paleoenvironments: HPC/XCB drilling in the Equatorial Pacific. (Pisias et al.)

Rationale: Continuous and undisturbed sections across major oceanic boundaries are essential to study and understand paleoceanographic and paleoclimatic evolution. This proposal ties into a global effort to study Cenozoic variations in the tropical Pacific, Atlantic and Indian Ocean.

A. Maturity: This is a well focused proposal which addresses important Neogene paleoceanographic objectives. It summarizes present state of knowledge. The choice of sites is well justified.

B. Documentation: Proposal lacks detailed site specific information. Some of this information is probably available from existing seismic lines across this frequently visited area of the Eastern Pacific.

C. Drilling Time: Eleven sites along two transects are proposed; the proposal states that 36.3 days for drilling and 17.2 days of transect time are needed, effectively occupying one leg.

D. Probability of Success: Very high. Sections are known to be complete, occurrences of all major microfossil groups have been proven. No drilling or recovery problems are foreseen.

CEPAC Prospectus

Theme: Lower Crust Penetration

Thematic Panel: LITH

Proposal: 286/E: Return to Hole 504B (Becker, et al.)

Rationale: Four legs drilling in 5.9 my-old crust 200 km S of the Costa Rica Rift produced the deepest basement section to date ($\sim$1288 m), including sediment and lavas, and $>$500 m of sheeted dikes. An oblique seismic experiment suggests layer 3 gabbros lie within a few hundreds of meters. Return to this site is proposed with the two-fold aim of resolving fundamental engineering problems and to continue drilling to layer 3.

Maturity: Scientific goals are an agreed top priority and engineering problems are clearly-defined. Drilling was terminated because of a lost drill bit, flamed casing, and poor drilling conditions. Options proposed here are:

1. commit an early CEPAC engineering leg to clean and recase hole 504B and drill a further 100 m (+ combine this with setting a base-rock guide at EPR 13 ° N);
2. devote a full leg to cleaning and recasing 504B and coring to Layer 3; or
3. *redrill* Site 504, coring only through sheeted dikes to gabbro.

Adequacy of Documentation: The section is documented by state-of-the-art logging, SCS and MCS inflection surveys, sonobouy refractions, heat flow, and an oblique seismic experiment in addition to chemical, physical, and petrologic studies of cored sediment, lavas, and dikes. "Cleanup", "sidetrack", and "redrill" options have been developed by G. Foes (ODP).

Drilling Time: A half to whole leg is estimated by the proponents, although a schedule for engineering questions appears unrealistic at present time.

Probability of Success: Resolution of drilling problems would guarantee achievement of scientific goals. However, inherent conditions of deep drilling in young, hot crust are problematic, and place scientific goals at considerable risk. It is possible that the second (implicit) goal of drilling at 504B (young basement) may ultimately detract from achieving prime goal.

CEPAC Prospectus

Theme: Ridge-Trench Interaction

Panel: TECP

Proposal: 8/E Chile Triple Junction (Cande)

Rationale: Theoretical considerations of the consequences of collision of a spreading ridge and inner trench walls are numerous. But factual information about ridge-trench collisions, and the effects of resulting tectonic and thermal processes is sparse and poorly recognized. The drilling proposal advocates the collection of factual information at the Chile Ridge-Trench collision zone.

A. Maturity The collision of the Chile Ridge and the Chile Trench is an ideal study area owing to the simple plate geometry involved, and because collision and pre-collision circumstances can be compared. However, owing to lack of field data, in particular offshore geophysical data, the present drilling concept or approach lacks maturity. A well-focused, clearly outlined drilling strategy has not (as a consequence) been presented.

B. Documentation Adequate documentation exists to outline the apparent consequences of ridge-trench collision that ought to be explored by drilling, in particular the ridge-collision effects of tectonic erosion, the consequence of subducted fracture-zone topography, and accelerated thermal processes. However, the existing data base, especially the lack of multifold profiles, greatly hinders the recognition of drilling sites where these effects and processes can most profitably be explored. Proper site location is the major deficiency of the present proposal. Cande will be conducting new site surveys: MCS, Seabeam and dredging in late '87-early '88 and will submit a new proposal.

C. Drilling Time: Based upon the present proposal which is immature operationally and in drilling-strategy, no meaningful drilling time can be estimated. However, if primary scientific objectives presently understood are addressed, at least one drilling leg would be required.

Probability of Success: The probability of success is difficult to assess based on existing site information. But no particular problems are foreseen unless inner trench (wall) sites in the collision zone are determined to be lacking a sufficiently thick sediment cover to stabilize the drill string.

Attachment 1

CEPAC Drilling Proposals Considered Up To and Including the Paris Meeting of September 29 - October 2, 1987

	#	THEME/AREA	AUTHOR(S)	RECEIVED (bold=last version)
	2/E	Middle America trench and Costa Rica margin	(Crowe & Buffler)	12/82
2.23	3/E	Flexural moats, Hawaiian Islands	(Watts et al.)	11/85
wd	4/E	Tuamoto Archipelago (French Polynesia)	(Okal et al.)	6/83
2.93	8/E	Southern Chile trench	(Cande)	9/83
	14/E	Zero age drilling: EPR 13°N	(Bougault)	1/84
	34/E	Pacific-Aleutian-Bering Sea (Pac-a-bers)	(Scholl & Vallier)	2/84
2.41	37/E	Costa Rica, test of duplex model	(Shipley et al.)	8/84
	75/E	Gulf of California	(K.Becker et al.)	8/84
1.6	76/E	EPR: oceanic crust at the axis	(Francheteau & Hekinian)	11/84
	84/E	Peru margin	(Kulm & Hussong)	9/84
	123/E	Studies at site 501/504	(Mottl)	12/84
	124/E	To deepen Hole 504B	(LITHP -K.Becker)	1/85
2.04	142/E	Ontong-Java Pl.:Equat. Pacific depth trans.	(L.Mayer & Berger)	4/85
2.55	153/E	Three sites in the SE Pacific	(J.Hays)	7/85
2.50	182/E	Sounder Ridge, Bering Sea: Stratigraphy	(Taira)	8/85
3.75	192/E	Baranoff fan, SE Gulf of Alaska	(Stevenson & Scholl)	10/85
1.75	195/E	Bering Sea paleo-environment & -climate	(Sancetta)	12/85
1.45	199/E	N.Pacific: Pelagic sedim in subarctic gyre	(Janecek et al.)	12/85
1.80	202/E	N.Marshall Isl. carbonate banks	(Schlanger)	12/85
1.5	203/E	Guyots in the central Pacific	(Winterer et al.)	12/85
3.10	207/E	Bering Sea basin & Aleutian ridge tectonics	(Rubenstone)	1/86
3.32	210/E	NE Gulf of Alaska: Yakutat cont. margin	(Lagoe & Armentrout)	1/86
3.3	212/E	Off northern & central California	(Greene)	1/86
2.60	213/E	Aleutian subduction: accret. controlling p.	(McCarthy & Scholl)	1/86
2.65	214/E	Central Aleutian forearc:Trench-slope break	(Ryan & Scholl)	1/86
2.5	221/E	Equatorial Pacific: L.Cenozoic paleoenviron	(Pisias et al.)	3/86
1.5	222/E	Ontong-Java Pl.: Origin, sedim. & tectonics	(Kroenke et al.)	3/86
2.7	224/E	Escanaba trough (Gorda Ridge), NE Pacific	(Fisk et al.)	4/86
2.7	225/E	Aleutian Basin, Bering Sea	(Cooper & Marlow)	4/86
3.4	227/E	Aleutian Ridge, subsidence and fragment:	(Vallier & Geist)	5/86
3.2	229/E	Bering Sea, Beringian cont. slope & rise	(Cooper et al.)	5/86
1.9	231/E	North Pacific magnetic quiet zone	(Mammerickx et al.)	5/86
1.10	232/E	N.Juan de Fuca R.: High temp.zero age crust	(E.Davis et al.)	5/86
1.90	233/E	Oregon accr. complex: Fluid proc. & struct.	(Kulm et al.)	5/86
2.7	234/E	Aleutian trench: Kinematics of plate cover.	(von Huene et al.)	6/86
3.36	236/E	N.Gulf of Alaska	(Bruns et al.)	6/86
2.20	237/E	Active margin off Vancouver Isl., NE Pac.	(Brandon & Yorath)	6/86
3.9	241/E	Gulf of Alaska (Yakutat block) & Zodiak fan	(Heller)	6/86
3.61	245/E	Transform margin of California	(Howell et al.)	7/86
2.90	247/E	NE Pacific: Oceanogr.,climatic & volc.evol.	(Pisias et al.)	7/86
2.55	248/E	Ontong-Java Plateau	(Ben-Avraham & Nur)	8/86
3.04	249/E	Sedimentation in the Aleutian trench	(Underwood)	8/86
2.68	250/E	Navy fan, California borderland	(Underwood)	8/86
2.15	252/E	Loihi Seamount, Hawaii	(Staudigel et al.)	10/86
1.78	253/E	Shatsky Rise:Black shales in ancestr. Pac.	(Schlanger & Silter)	8/86
2.33	256/E	Queen Charlotte Transform fault	(Hyndman et al.)	9/86
	257/E	Farallon Basin, Gulf of California	(Lawver et al.)	9/86
2.27	258/E	Stockwork zone on Galapagos Ridge	(Embley et al.)	10/86
2.25	259/E	Meiji sediment drift, NE Pacific	(Keigwin)	10/86
1.55	261/E	History of the Mesozoic Pacific Ocean	(Larson & Lancelot)	10/86
2.65	260/D	Ogasawara Plateau	(Saito et al.)	10/86
2.94	263/E	S.Explorer Ridge, NE Pacific	(Chase et al.)	11/86
3.95	269/E	Aleutian pyroclastic flows in marine envir.	(Stix)	12/86
	271/E	Paleoceanogr. trans. of California current	(Barron et al.)	2/87
	275/E	Gulf of California (composite proposal)	(Simoneit & Dauphin,eds)	3/87
	277/E	Aseismic slip in the Cascadia margin	(Brandon)	4/87
	278/E	Blanco transf. fault: Alter., layer three..	(Hart et al.)	5/87
	279/E	Anatomy of a seamount:Seamount 6 near EPR	(Batiza)	5/87
	280/E	Cretac.Geisha Seamounts & guyots, W-Pac	(Vogt et al.)	6/87
	282/E	Tracing the Hawaiian hotspot	(Niitsuma & Okada)	6/87
	283/E	Interplay betw. Kuroshio & Pacific plate	(Jacobi, Hayes et al.)	6/87
	284/E	Escanaba Trough, So. Gorda Ridge	(Zierenberg et al.)	7/87
	285/E	Jurassic quiet zone, western Pacific	(Handschumacher et al.)	7/87
	286/E	Return to Hole 504B, layer 2/3 trans.	(Becker)	7/87
	287/E	Drilling in the M-series, western Pacific	(Handschumacher & Vogt)	8/87
	222/E	(Addendum) Ontong Java Plateau	(Mahoney & Kroenke)	7/87

Attachment 2

LITHP Prioritized Themes for CEPAC

(Sept.-Oct., 1987)

Ranking	Votes
1. Structure of lower oceanic crust, return to 504B (286E)	73
2. Magmatic and hydrothermal processes at sediment-free ridge crest, EPR (76E)	65
3. Magmatic and hydrothermal processes at sedimented ridge crest Juan de Fuca Ridge (232E) Escanaba Trough (224E, 284E) Guaymas Basin (275E)	54
4. Early magmatic evolution of hotspot volcanos Loihi (252E) Marquesas ( )	46
5. Crustal structure and magmatic evolution of oceanic plateaus Ontong-Java Plateau (222E, revised)	45
6. Old oceanic crust, Jurassic Quiet Zone (285E)	34

Group 1 (Highest Ranking)

Juan de Fuca/sedimented ridge crest (232E)
Young hotspot volcano - Loihi (252E); Marquesas
Deep structure of oceanic crust - 504B (285E)
Ontong-Java Plateau (222E, revised)
Jurassic Quiet Zone (285E); EPR Hydrothermal (76E, revised)

Group 2 (High, but with qualifications)

Escanaba Trough (224E, 284E)
Early cont. rifting; Gulf of Calif. (275E)
Old Pacific crust (261E)
Axial seamount (280E)
Hawaiian flexure (3E)
Guaymas hydrothermal (275E)
M-Series (287E)
EPR seamounts (279E)

Group 3 (Limited LITHP interest)

Atolls and guyots (202/203E)
Ontong-Java (248E)
Magnetic Quiet Zone (231E)
Geisha seamounts (279E)
Pacific plate motions (283E)

Group 4 (Immature/serious deficiencies)

Galapagos stockwork (258E)
Explorer Ridge (263E)
Manzonillo Rift (275E)
Blanco transform (278E)
Hawaiian hotspot trace (282E)

Attachment 3

TECP Prioritized Themes for CEPAC

(Sept., 1987)

Highest Priority by Clear Majority

M-series Dating/Calibration (285E, 287E)
Flexure of Lithosphere (3E)
Ridge Trench Interaction (8E)
Pre-70 Ma Absolute Motion (280E, 203E (partial))

Second Highest Priority — Address in Combination with Other Programs

K Quiet Zone (231E)
Intra-plate Volcanism (261E (partial))
Arc Magmatism (285E, 287E (contributing))
Deformation Front (277E)
'Young' Absolute Motion (247E, 282E, 283E)
Subsidence/Sea-Level (202E, 203E (partial))

Little Support at this Meeting

Atolls and guyots (202/203E)
Ontong-Java (248E)
Magnetic Quiet Zone (231E)
Geisha seamounts (279E)
Pacific plate motions (283E)

Group 4 (Immature/serious deficiencies)

Galapagos stockwork (258E)
Explorer Ridge (263E)
Manzanillo Rift (275E)
Blanco transform (278E)
Hawaiian hotspot trace (282E)

Attachment 4

SOHP Prioritized Themes for CEPAC

(Sept., 1987)

		Rank
(1) Theme: Neogene Paleoenvironment		
221/E	Eq. Pacific Paleoenvironments	1
142/E	Ontong Java Transect	1
195/E	Bering Sea/Umnak	3
271/E	California Current Transect	4
199, 259/E	North Pacific Gyre & Meiji Drift	5
257, 275/E	Gulf of California	5
(2) Theme: Mesozoic Paleoceanography (2)		
202, 203, 260	Atolls & Guyots (only those parts of each proposal dealing with sediment caps)	1
182, 195	Bering Sea	2
222	Ontong Java History	3
199	N. Pacific Gyre	3
(3) Theme: Sea Level: Atolls and Guyots (SLAG)		
202	Marshall drowned atolls	1
260	Ogawawara Plateau	2
203	Pacific Guyots	3
(4) Theme: Anoxic Events		
253	Shatsky Rise	1
275/257	Gulf of California	2
182	Bering Sea	3
(5) Theme: Old Pacific Crust		
285	Jurassic Quiet Zone (replacing 261)	1
(6) Theme: Fans and Sedimentary Processes		
250	Navy Fan	1
271	California Current	2
275	Gulf of California	3
(7) Theme: Metalogenesis and Diagenesis		
233	Oregon Accretionary Margin	1
284/224	Escanaba Trough	2
275/257	Gulf of California	3

Attachment 5

FIRST PROSPECTUS FOR CENTRAL AND EASTERN PACIFIC DRILLING

Preface

This First Prospectus for CEPAC drilling is based on the Panel's deliberations up to and including the March 30-31 meeting at Northwestern University. The Panel has taken into consideration instructions from PCOM developed at the January 19-23 meeting in Honolulu, recommendations from SOHP, TECP and LITHP and a request from SSP for site survey status and needs.

CEPAC wishes to remind the PCOM and other planning groups that the region assigned to CEPAC is the largest in the world, with consequent port call and steaming time problems and contains arguably the most diverse set of geologic provinces and problem sets of any assigned region.

The plate configuration and motion history remains enigmatic over large parts of the Cretaceous and Jurassic Pacific. Locations and paths of hot-spots and the history and petrologic implications of off-ridge, mid-plate volcanism are poorly defined. The stratigraphic record from pre M-25 time to the present has been poorly sampled leaving a host of paleoceanographic questions to be addressed. MOR processes and products is a field that has only been scratched. The vertical tectonic history of the western portion of the region does not fit easily into subsidence models; the geological and geophysical information contained in seamounts, guyots and their capping sediments remains untapped. The world's largest and most diverse set of convergent boundaries with their tectonic, sedimentologic and geochemical histories only vaguely known border the region. An 18 month drilling program could be devoted to any one of these thematic problems.

The program put forward in this First Prospectus is certainly in an early stage of development; proposals from workshops and individuals are still expected and our information on site surveys is incomplete. The dozen or so "Legs" proposed here have been selected from approximately 50 proposals reviewed by the end of the March 30-31 CEPAC meeting.

OUTLINE OF INITIAL TENTATIVE PROSPECTUS FOR CENTRAL AND EASTERN PACIFIC DRILLING

(not priority ranked)

Program	Proposals	Notes	CEPAC "Watchdog"
Juan de Fuca	232/E	Probably one Leg	E. Davis
EPR at 13 ° N	76/E	Question of doing this on sequential legs or in 504B style unresolved	J. Francheteau
Guyots (Cret.) Drowned Atolls	203/E 202/F	Presently as "package"; probably 2 Legs	M. Flower
Old Pacific	252/E	History indicates probably 1 Leg	H. Jenkyns
Ontong Java Plateau	142/E 222/E	Presently a "package"; possibly 2 Legs with one in WPAC schedule	S. Schlanger
North Pac	199/E 231/E 259/E	Presently a "package" of undetermined length	C. Sancetta
Bering Sea	195/E 182/E 225/E	Presently a "package" of undetermined length	H. Schrader
Young midplate "hotspot" volcanism	252/E	Presently a "package"; Loihi SM (252/E) and other expected proposals	M. Flower
Cascadia convergent margin	233/E 237/E	Presently a "package"	D. Scholl
Shatsky Rise	253/E	Probably a Leg	W. Sliter

Notes:

- Gulf of California and expected SOPAC proposals have not yet been considered.
- This outline prospectus is not to be viewed without consideration of preceding material.
- This outline prospectus will be subject to possible major modifications.

SOUTHERN OCEAN PANEL
Executive Summary.

Columbus, Ohio, 8-9 October 1987

1. Ciesielski and Kristoffersen reported on Leg 114. SOP judged important:

1.1 Leg 114 are to be congratulated on an excellent achievement under great difficulties. Drill ship's capabilities in adverse weather amply demonstrated.

1.2 10-foot scope of wireline heave compensator inadequate in rough weather, degrading vertical resolution of logs, particularly important for Milankovich signals. TAMU and/or LDGO to note.

1.3 Drill ship now carries 1 less roughneck than on 114. Conditions on rig floor during 119 and 120 will be as bad as 113 and 114, and a replacement is highly desirable, if only temporarily. TAMU to note.

2. Wise (co-chief designate, 120) reported on preparations for 119, 120, in absence of TAMU rep. Both legs appear well-staffed, sites were all PPSP-approved except for deeper part of SKP-3 and a short section of Prydz Bay Line 21. Post-cruise collaboration proposed betweeen 119 and 120 is to be applauded. Air or shipboard ice reconnaissance of Prydz Bay is highly desirable: TAMU to contact NSF/DPP and Australians (Quilty?) again.

3. New Panel Structure. SOP considered:

3.1 New structure is an improvement in many ways but, if regional panels are denied comment or influence on the science of proposals,

3.2 standard and number of proposals reaching thematic panels will decline

3.3 PCOM and thematic panel workload will nonetheless increase, which is undesirable

3.4 regional panel members will decline to serve

3.5 relict regional panel duties overlap SSP.

SOP felt proponents need more help than new system will be able to give; SOP has acted as nursemaid, friend, safety-net etc. Regional panels should see rejected proposals also, and continue this role.

4. SOP's plans for this meeting, to produce S Pacific "Prospectus", upset by changing remit. After discussion, SOP decided most fruitful course was to review all aspects of existing South Pacific proposals in the system, plus S Pacific Workshop "ideas" proposals, as planned, with view to advising proponents on revisions recommended for initial thematic review under new system. Proponents will thus be given chance of revision before next thematic panel meetings (?March SOHP and LithP; June TECP?). To aid review, thematic panel reps outlined current panel priorities. Reviewed were

73/C	Adelie Coast (Wannesson et al)
230/C	Wilkes Land margin (Eittreim et al) (combine these 2 with "coldspot" and Ceduna Plateau proposals suggested, as previously)
169/C	South Tasman Rise (Hinz and Dostmann)
129/C rev	Bounty Trough (Davy)
244/C rev	Ross Sea (Cooper et al)
8/E	Chile Triple Junction (Cande)
153/E	Southeast Pacific (Hays)
209/C	Eltanin FZ (Dunn)

and proposals or groups of proposals from the S Pacific Workshop Report, from which Antarctic Peninsula margin, Bransfield Strait and N-S EPR transect proposals were thought particularly interesting. The last in particular needs urgent development effort.

5. Membership Rotation. Kennett, Ciesielski and Elliot are all due to rotate off. SOP voted thanks to all for considerable contributions, particularly Jim Kennett as first SOP chairman. Decided strong thematic replacements are desirable, suggested Corliss or Hodell, Barron or Lazarus, Domack or Krissek respectively, but wished to delay invitations until remit of SOP became clear.

6. Next meeting proposed Norway, on invitation Yngve Kristoffersen. As soon as possible after Legs 119 and 120, and after next thematic panel meetings (May 1988?).

P F Barker
Chairman, SOP. 21 October 1987.

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

University of Washington
Seattle

August 18-19, 1987

EXECUTIVE SUMMARY

1. A working group of DMP met prior to the Panel meeting to review the status of physical properties measurements on board ship and to formulate recommendations for improvement. Working group recommendations were adopted by DMP, in particular the request that a subgroup of DMP members be formed with special responsibility for physical properties to advise the programme through DMP.

2. There remain arbitrary departures from logging programmes because of Co-chief aberrations. Panel request a letter from PCOM chairman to each Co-chief explaining that the overall scientific direction of ODP takes precedence over local objectives and elucidating the position that logging forms an integral part of ODP science.

3. As a result of cuts in the enhancement budget, the Schlumberger Formation Microscanner (FMS) originally scheduled for ODP modification in FY 87 now becomes Priority 1 for FY 88. This will occupy the entire logging tool enhancements budget for FY 88. The FMS is a high vertical resolution (< 1 cm) electrical pad device which can produce electrical images of a formation so that facies and structure can be identified on a fine scale. Its potential application to sediment cyclicity and fine structure is considerable.

4. The Nankai Geotechnical Leg is considered to be best accommodated within a scheduled leg (tentatively leg 128) rather than as a separate mini-leg. The Geoprops Probe is seen as central to the success to this leg.

5. Logging schedules have been identified up to quasi-leg 133 excepting Leg 121 for which sites had not been identified.

Paul F. Worthington

23 September, 1987

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

University of Washington
Seattle

August 18 - 19, 1987

MINUTES

Present

Chairman:	P.F. Worthington (UK)
Members:	R. Carson (USA) E. Howell (USA) R. Porter (USA) R. Stephen (USA) H. Kinoshita (Japan) J-P. Pozzi (France) M. Salisbury (Canada) B. Steingrimsson (ESF) H. Villinger (FRG) S. Bell (at-large)
Liaisons:	E. Taylor (ODP/TAMU) R. Anderson (LDGO) X. Golovchenko (LDGO) M. Langseth (PCOM) R. McDuff (PCOM) K. Becker (LITHP) S. Stambaugh (JOIDES)
Guests:	P. Jackson (PPWG) D. Karig (PPWG)
Apologies:	G. Olhoeft (USA) R. Traeger (USA)
Absent:	F. Sayles (USA) C. Sondergeld (USA)

Note: PPWG denotes Physical Properties Working Group

1. Welcome and Introductory Remarks

The meeting was called to order at 8.40 am. The Chairman welcomed DMP Members, Liaisons and Guests, especially those members attending for the first time (Carson, Porter), the JOIDES liaison (Stambaugh), and guests from the Physical Properties Working Group which met on the previous day (Jackson, Karig). This was the second DMP meeting of 1987 and would be the last of the year. Business should be transacted accordingly.

Review of Agenda and Revisions

The question of a TEDCOM liaison should be addressed under Item 19.

Proposal 272/F requires a more detailed response to PCOM.

Subject to these items being addressed, the pre-circulated agenda was adopted as a working document for the meeting.

2. Minutes of previous DMP meeting, College Station, Texas, April 2 - 3 1987

These were adopted without modification. Chairman signed the master copy for ODP records.

3. PCOM Report

PCOM Liaison produced an excellent report on the PCOM meeting held on 10 - 12 April 1987 in Washington DC (Annexure 1).

The Chairman congratulated McDuff on his most efficient reporting.

DMP responded to PCOM comments on DMP recommendations as follows:

(i) DMP Recommendation 1987/2

PCOM sought clarification of DMP policy on VSP. DMP to defer response until after JOI-USSAC workshop on VSP scheduled for following week. Particular concern expressed by DMP about the management of any ensuing VSP development programme. R. Stephen will convey to the VSP workshop the DMP concern over how this management would be established. [ACTION: STEPHEN]

(ii) DMP Recommendation 1987/18

PCOM sought clarification of DMP response to proposal 272/F. DMP strongly supports emplacement of long-term temperature monitors in hole NKT 2 for operating period of 3 years. Strategy must include plans for removal after this period. This work forms part of scientific experiments in the Nankai leg.

(iii) DMP Recommendation 1987/20

PCOM requests that DMP meetings be scheduled further ahead of PCOM meetings to allow ample time for transmission of recommendations. Accepted! Present meeting was scheduled as late as possible in order to allow the most contemporary assessment of improvement in the performance of the Operator in drilling loggable hole. With an improvement anticipated, the scheduling of DMP meetings will be ahead of PCOM meetings.

4. National Reports

The Chairman called for reports on developments in the downhole measurements area from the National Representatives.

(i) FRANCE (POZZI)

Two key areas: downhole magnetics and wireline re-entry

(a) Magnetics:

Magnetometer at prototype stage, diameter too large for ODP use, needs slimholing. Susceptibility tool (Dipole - dipole probe, rated to 125°C) is small enough for ODP use. However, there are interpretational difficulties which need to be resolved. Tool planned for testing at Lamont in November 1987.

(b) Wireline Re-entry: F.A.R.E. programme scheduled for trials in April 1988. Objective is to demonstrate the technical feasibility of wireline re-entry.

(ii) WEST GERMANY (VILLINGER)

FRG is starting a Deep Continental Drilling Project with a 14 km hole planned for Bavaria. Drilling to commence in September. Logging to be undertaken by Schlumberger. Greater liaison with DMP sought. Proposed that a programme scientist be invited to next DMP meeting to outline technical strategy. **(ACTION: WORTHINGTON)**

(iii) CANADA (SALISBURY)

Atlantic Geoscience Center (Moran) is developing a two-fold approach to geotechnical data (pore pressure, stress) acquisition in intermediate depth (semi-consolidated) region. First, is insertion of additional pressure sensor in HPC shoe. Second, is a drill-in tool ahead of the bit with pressure/stress sensor. Latter is longer-term project.

Logging workshop in Canada scheduled for January/February 1988, probably in Ottawa.

Hydrofrac. information with a bearing on stress magnitudes/directions may be contained in drilling pressure records. P. Killeen of Canadian Geological Survey is interested in this problem. Chairman to write to affirm DMP's interest and to encourage feasibility study. (ACTION: WORTHINGTON)

(iv) JAPAN (KINOSHITA)

Long term temperature measurements in the Nankai Trough. Issues to be resolved are the duration of observations, etc. Deployment for say three years in hole with no retrieval plans thereafter. This would essentially remove hole availability for other experiments. (Strategy should make provision for tool removal - item 3(ii)).

Other experiments are scheduled for the Japan Sea: these are an oblique seismic experiment using a downhole seismometer array to investigate crustal deformation, strain, etc., and an oblique electrical experiment with downhole potential electrodes and a ship-based current source.

(v) UNITED KINGDOM (WORTHINGTON)

A multisensor system for downhole geochemical analysis of pore water samples is being developed at the University of Newcastle. Principal investigator is J. Cann. Contact has been made with TAM Inc. to ensure that the facility is compatible with the ODP wireline packer.

A research grant has been awarded to the University of Nottingham by NERC to support the geochemical evaluation of logs and core data from Hole 504 B. Principal investigator is M. Lovell.

5. Physical Properties Working Group

A physical properties working group met on 17 August 1987 with PCOM approval. Group comprised P.F. Worthington, R. Carson, and M. Salisbury of DMP and P. Jackson (UK), D. Karig (Cornell) and E. Taylor (TAMU/ODP). Group proposals were adopted by DMP as follows.

DMP Recommendation 1987/21

"(A) **Physico-mechanical properties (laboratory) data** should be gathered in accordance with the following philosophy:

- for each parameter measured downhole there should be a corresponding laboratory measurement on board ship; this would provide improved calibration and interpretation;

- laboratory data should be obtained at restored in situ conditions where possible;

- laboratory data should be three-dimensional where appropriate to take account of anisotropy.

Two types of data should be measured:

- scanning, eg. GRAPE, PWL, of whole core
- detailed, eg. resistivity, velocity, on plugs

Detailed measurements should be integrated with parallel investigations on same material in sedimentology, geochemistry, etc.

In pursuit of these objectives, the following technical developments are needed.

SCANNING: multisensor facility comprising GRAPE (available), PWL (available), magnetic susceptibility (under development) and natural gamma spectral (new development). Seek modular enhancements by addition of ultrasonic sensor to assess core quality and correlate with downhole measurements.

DETAILED: instrumented pressure cell for compressional and shear velocities and resistivity (new development). Fluid cell for pore water resistivity (upgrade of existing geochemical facility). Constant-flow permeameter (under development). XRF (available but under threat) must be reactivated. Anelastic relaxation monitor (new development).

[These developments complement the existing gravimetric/volumetric determination of density and porosity, thermal conductivity measurements, cryogenic magnetics, consolidation tests, and vane shear tests, facilities for which already exist. The Hamilton Frame would become redundant.]

(B) **Physico-mechanical properties (in situ) data** should be gathered in accordance with the GEOPROPS PROBE principle: pore pressure, permeability, porosity, strain, stress.

(C) **Sampling methodology** should be improved as follows:

- core orientation, absolutely vital that routine downhole technology be developed;
- multiscanning of whole core to recognise intact material and guide point sample selection; this would be enhanced by an ultrasonic caliper/imager in the multisensor system;
- point sampling (plugs) to be taken prior to splitting;
- during structurally important legs, identify fabric and split perpendicular to it.

(D) **Priorities** for acquisition/development

(1) Downhole core orientation; feasibility study to investigate available methodology

(2) Geoprops Probe 1

(3) Seismic/Resistivity cell with pore water resistivity

(4) Anelastic relaxation facility

(5) Spectral gamma sensor/ultrasonic sensor; feasibility study for incorporation into multisensor array.

(E) A subgroup of DMP members be formed with special responsibility for physical properties, to advise the programme through DMP on physical properties matters.

(F) It is imperative that a dedicated technician be available for physical properties measurements on board ship."

6. Report on JOI-USSAC Workshop on Wellbore Sampling

The Chairman had attended this workshop in Houston during the period 27-29 May 1987. The workshop was co-convened by B. Harding and R. Traegar. In Traegar's absence, the Chairman reported to the Panel. The workshop purpose was to air technology in different sampling disciplines and to identify deficiencies in current technology. Notes on the workshop are appended (Annexure 2). The Chairman had made an impromptu presentation on "Sampling for Physical Properties" during the Technology Review. Five working groups had been convened to address specific topics. Worthington had also chaired the Group on "Sample Handling and Preservation". Key messages from these five groups are contained within Annexure 2. These messages have a profound bearing on the work of the DMP Physical Properties Sub-group. A full report on the workshop is being prepared by the co-convenors.

7. COSOD II

The Chairman reported that a technology white paper on downhole measurements had been co-authored for COSOD II by seven panel members. The Chairman had presented this paper anonymously at COSOD II.

Messages reported by attendees included the importance of stress measurements, the need for investigations of mantle heterogeneity, suggestions for a deep oceanic crustal borehole (5-6 km deep) and a move towards extending the worldwide seismic net to the oceans. The fluid circulation group was very supportive of downhole measurements; the sedimentary groups seemed less keen on logs. This last comment is surprising in view of the successful recognition of sediment cyclicity in log records from different continents. A key aspect is the need for a high resolution tool (e.g. Formation Microscanner) within ODP.

The organisation of COSOD II had introduced pronounced departures from the usual procedural standards of international conferences.

8. Logging Contractor's Report

Anderson reported an improvement in the productivity of the Operator in drilling loggable hole. The earlier problems of XCB deployment seem to have abated but some hardware problems remain.

Leg 113 had provided a clear example of log recognition of Milankovitch cycles in the Weddell Sea.

Legs 114 and 116 were good legs for logging. However, Leg 116 revealed a new problem. Bits are not dropping off the string prior to logging. This has rendered some holes unloggable.

Leg 115 was a disappointment. One of the Co-chief's cut the PCOM-approved logging programme by half at an early stage of the Leg. The TAMU Operations Manager did not enforce PCOM directives. DMP expressed grave concern at this arbitrary reduction in the scheduled logging programme for Leg 115. The following recommendation was adopted.

DMP Recommendation 1987/22

"Co-chief scientists should be made aware of their responsibilities to the overall scientific direction of ODP vis-a-vis the local objectives of a particular leg. PCOM should point this out by letter to each appointed Co-chief in advance of a leg. This letter should make specific mention of the scientific value of logging."

A letter will be drafted for PCOM Chairman's perusal.

[ACTION : WORTHINGTON]

9. Technical Reviews

The Logging Contractor reviewed two technical areas, log calibration and vertical resolution.

(i) LOG CALIBRATION

Virtually all the log calibration problems in ODP stem from the requirement to pass tools through a 4-inch I.D. pipe and then log a 12-inch diameter borehole. (Tool nomenclature - see item 9(ii)).

Caliper: this is mechanical and crude. It is difficult to design a caliper to fit within the drill pipe and yet open sufficiently for a 12-inch hole. Calibration status - POOR.

SDT: compares well with MCS data. (MCS to be given a shear source for use in low velocity formations) SDT calibration status - VERY GOOD.

CNT-G: the neutron porosities obtained with an Am-Be source on the one hand and a Cf source on the other are not equal. Reason not known. High and low porosities have always proved difficult to evaluate. Some improvement achievable through a second bow spring in conjunction with new software. Calibration status - VERY POOR.

LDT: very poor in rugose hole because of the narrow drill pipe; the (neutron porosity) bow spring has to be weak enough to contract to 4-inch diameter. ODP needs the Schlumberger high resolution LDT (HLDT) with photoelectric absorption index and density output for both near and far detectors. Calibration status - BAD IN RUGOSE HOLES.

NGT: where the NGT is run in combination with other nuclear tools (CNT-G, LDT, GST, AACT) the Cf and minitron sources are increasing the recorded K and Th counts through formation activation. The U counts are lower because the spikes are being moved out of the recording gates. This is not a serious problem since NGT is run here for depth control. NGT is also run with seismic-stratigraphy tool combination and this can be used for geochemical interpretation. Calibration status - VERY GOOD.

GST: this is currently run without a boron sleeve in order to fit through drill pipe. The chlorine effect from the borehole is therefore very strong. Requirement is for a boron sleeve which can be run through ODP pipe. This would require milling down the existing pressure housing. An unsleeved tool needs two passes for accurate geochemistry. A GST calibration experiment is planned in basalts of known geochemistry. A germanium tool with a Cf source from Princeton Gamma Tech. is to be run in the same basalts later in the year. Calibration status - POOR.

(ii) VERTICAL RESOLUTION

The following table reportedly summarises the vertical resolution of ODP logging tools. The figures constitute guidelines only. The microlog and formation microscanner are not available to ODP because they are too large to pass through the drill pipe (see item 10).

ACRONYM	TOOL	VERTICAL RESOLUTION
ILM	medium induction res.	5 ft
ILD	deep induction res.	5 ft
SFL	spherically focused res.	2.5 ft
LLD	deep laterolog	2 ft
LLS	shallow laterolog	2 ft
LDT	lithodensity log	10 inches - 2 ft
CNT-G	neutron porosity	10 inches
LSS	long spacing sonic	2 ft
GST	induced gamma spectrometry	1 ft
ACT/NGT	aluminium clay tool natural gamma spectrometry	6 inches 6 inches
MCS	multichannel sonic	6 inches - 5.5 ft
BHTV	borehole televiewer	0.5 inches
ML	microlog	2 inches
FMS	formation microscanner	.15 inches

Notes: the sonic digital tool (SDT) has a vertical resolution range similar to MCS; the induction phasor tool improves the ILD/ILM resolution to something over 3 ft.

10. Budget Status

FY87 (refer previous minutes)

Priority 1: Temperature tools are being developed and will hopefully be ready for Leg 118.

Priority 2: User software/data dissemination is ongoing.

Priority 3: Miniaturization of FMS was deferred for budget reasons.

FY88 (refer previous minutes)

Priority 1: three component gyro magnetometer/susceptibility tool.

The USGS tool which it was intended to purchase shows pronounced drift and is unlikely to be suitable. The University of Washington tool will become available in September and is to be deployed in Leg 118, but with no gyro. Provide for development of universal gyro subs. in FY89.

Priority 2: third wireline packer.

In one third of the tests with the TAM tool the packers are not closing to below 4 inches in diameter. These difficulties need to be resolved before committing to a third tool. Defer to FY89.

Priority 3: digital televiewers.

These had been contingent upon USSR entry to ODP and are no longer viable for FY88. Defer to FY89.

LDGO has been given only a $30,000 increase in budget for FY88. The formation microscanner miniaturization deferred from FY87 is now the highest priority for FY88. This would absorb all the LDGO budget for enhancements. In view of the pressing need for a high vertical resolution tool, the FMS development was seen as absolutely imperative.

FY89 (refer previous minutes)

Recommendations for FY89 essentially comprise the completion of the FMS development programme, the 3rd wireline packer and two digital televiewers deferred from FY88, two universal gyro subs for use with any tool, and development of an induced polarization tool as previously identified for FY89.

DMP Recommendation 1987/23

"Equipment enhancements: FY88 and FY89

FY88 : development of modified formation microscanner (FMS)
($100,000)

FY89 : continuation of FMS development [A]
3rd wireline packer [B]
Two gyro subs. [B]
Two digital televiewers [B]
Two induced polarization tools [C]

Priorities FY89 : A - committed
B - essential
C - desirable"

N.B. DMP urges France to continue with the development of the high resolution magnetometer.

11. Scientific Value of Logging

Agenda item deferred to January 1988.

12. Upcoming Legs - General Overview

Taylor and Golovchenko reviewed scheduling for Legs 116-120.

JOIDES Resolution is currently in Colombo at end of Leg 116.

Co-chiefs have been appointed as far as Leg 121.

Leg 117 : sites have been changed; logging is mostly standard; VSP on Owen Ridge will go ahead with the Schlumberger WST; TAMU run WST sources with processing in the Schlumberger Cyber Service Unit.

Leg 118 : ten days added; main effort will be directed towards locating guidebase; PCOM has accepted DMP recommendation of 8.3 days logging; back-up logging programme is also as recommended by DMP; a strong downhole measurements contingent is included in the shipboard party.

Legs 119/120 : PCOM has re-organised the drilling schedule but logging programme is as recommended, VSP on both these legs; no JOIDES logging scientists identified but a VSP specialist might be a possibility for Leg 119.

13. Logging Plan - Legs 121-123

Taylor and Golovchenko reviewed the current status of planning, scientific objectives and the envisaged logging programme.

Leg 121 comprises eight proposed sites pending IOP review. Processing of site survey data is not yet complete. Consideration deferred to next DMP meeting. In the meantime the Logging Contractor will mail to DMP members details of the revised IOP proposal with PCOM modifications and a suggested logging programme. (ACTION: ANDERSON)

DMP Recommendation 1987/24

"Provision be made for hydrofraccing to be done in Hole AAP1B, Leg 123. Estimated time required is four days. This would provide stress magnitudes which form an integral part of the thematic drive towards a better understanding of global stress regimes."

Specific recommendations concerning the logging programmes are encompassed within DMP Recommendation 1987/26 (below).

14. Logging Plan - Legs 124 and Beyond

Taylor and Golovchenko reviewed the status of planning of a quasi-leg structure by WPAC.

DMP Recommendation 1987/25

"The first run of the Formation Microscanner (estimated Leg 124) should have a dedicated scientist to integrate the evaluation of wireline core imaging in oceanic sedimentary sequences. This is contingent upon shipboard processing facilities becoming available."

Specific recommendations concerning the logging programmes are encompassed within DMP Recommendation 1987/26 (below).

15. Nankai Geotechnical Leg

Karig reviewed the technical goals. Panel considered that best prospect for success lay in scheduling geotechnical work within a full Leg as opposed to a mini-leg. This would require 65 days (as opposed to WPAC 56 day proposal). Specific recommendations concerning the logging programmes are encompassed withn DMP Recommendation 1987/26 (below).

DMP Recommendation 1987/26

"General Notes:

(1) **Standard Schlumberger suite run at all listed sites.**

(2) **Temperature (APC-T) run at all listed sites.**

(3) Televiewer to be run in hole for as long as useful data are being recorded.

(4) Formation microscanner (FMS) presumed to be integrated into Schlumberger standard suite after Leg 125*.

(5) * denotes WPAC quasi-leg number.

(6) Legs 132*, 134* - 136* : no amendment to DMP November 1986 minutes at this stage.

(A) Scheduled Legs

Leg 121 - BROKEN RIDGE

Identification of logging programme deferred pending IOP/PCOM site selection.

Leg 122 - EXMOUTH PLATEAU

Sites EP6, 7, 2A, 10A

Request from site-survey geophysicists for high resolution seismic waveform log for Sites EP6, 7 probably met by new sonic digital tool within standard suite. Use MCS as contingency.

Leg 123 - ARGO

Site AAP1B - BHTV
Magnetometer/susceptibility (basement)
VSP

Hydrofraccing recommended in this unique hole (see DMP Recommendation 1987/24)

Site EP 9B - (Standard suite)

(B) Western Pacific Quasi-Legs

Leg 124* - BANDA SEA

Sites BND 1, 3 - FMS
(see DMP Recommendation 1987/25)

Site BND 2 - Magnetometer/televiewer

Leg 125* - SUNDA ARC

Sites S1, T1, S3 - BHTV
FMS
Temp. (Barnes-Uyeda)

Sites S2, T2 - BHTV
FMS
Temp. (Barnes-Uyeda)
Wireline Packer

Sites F1, F2 - FMS
Temp. (Barnes-Uyeda)
Wireline Packer

Leg 126* - SULU SEA

Sites SULU 4, SCS 9 - (Standard suite)

Site SULU 5 - BHTV
Temp. (Barnes-Uyeda)

Leg 127* - BONIN I

Sites BON 1, 2 - (Standard suite)

Sites BON 5A, 5B - Wireline Packer

Re-entry at one site for downhole observatory

Leg 128* - NANKAI TROUGH/GEOTECHNICAL

Site NKT 1 - BHTV
Wireline Packer
Dual Laterolog
MCS
VSP
Geoprops Probe

Site NKT 2 - BHTV
Wireline Packer
Dual Laterolog
MCS
VSP (oblique)
Temperature (Japanese expt)
Geoprops Probe

VSP contingent upon emergence of a research specialist commmitted to interpretation.

WPAC estimate of 56 days for this leg is grossly inadequate. This proposal is for 65 days which is minimum for a single Nankai Trough/Geotechnical leg. Alternative is to schedule Nankai Trough leg followed by a dedicated geotechnical mini-leg.

Leg 129* - JAPAN SEA I

Site J 1b - BHTV
Wireline Packer
Magnetometer/susceptibility (basement)
Oblique Seismic Experiment (deployment)
VSP
Geoelectrical Experiment

A re-entry cone is needed (cf scientific legacy). Borehole seismometer deployment is long-term. Geoelectrical experiment is a pioneering venture.

Site J 1d, 1e - BHTV
Magnetometer/susceptibilty (basement)

Site 3a - BHTV
Magnetometer (basement)

Leg 130* - JAPAN SEA II

Site JS2 - (Standard Suite)

Site JS2A - VSP
Wireline Packer
Induced Polarization

Leg 131* - BONIN II

Site BON 6 - BHTV
Wireline Packer
Magnetometer/susceptibility (basement)

Site BON 7 - Wireline Packer

Site BON 8 - (Standard suite)

Leg 133* - N.E. AUSTRALIA

Sites NEA 1,2,3,4 - Dual laterolog

Site NEA 5 - Dual laterolog
VSP

Sites NEA 9,10,12 - (Standard suite)"

16. Proposal 277/E

DMP Response

Concept is strongly endorsed by Panel. DMP questions whether several tiltmeters in several shallow holes would be more useful than a single tiltmeter in one deep hole. Panel requests information on the kind of logging/downhole experiments that the Proposer would envisage to complement his programme.

17. Nominations for DMP membership

M. Salisbury has expressed wish to leave panel after many years.

F. Sayles is not active and is rotated off.

W. Givens did not accept earlier nomination.

This leaves 3 vacancies for 1988. No other rotations are planned at this stage.

DMP Recommendation 1987/27

"The following are recommended by DMP for panel membership

(1) Roy Wilkins (University of Hawaii)
(2) Dan Karig (Cornell University)
(3) Harold Vinegar (Shell, Houston)
(4) C. Neumann (Chevron, La Habra, Ca)
[alternative if H. Vinegar declines]"

18. Date of next meeting

DMP Recommendation 1987/28

"JOIDES Downhole Measurements Panel to meet in Miami, Florida, on January 19-20, 1988."

19. Other business

Nomination of DMP liaison to TEDCOM. The Chairman reported that he would be meeting TEDCOM chairman in late September to discuss subjects of mutual interest. He would report back to the Panel at the next meeting. For the time being, therefore, Chairman will assume liaison role. A formal nomination for PCOM approval will be tabled at the next Panel meeting.

20. Close of meeting

The Chairman thanked Dr R. McDuff for his hosting of the meeting and Dr M. Salisbury for his service to the Panel over the years.

The meeting closed at 3.01 pm on August 19, 1987.

Paul F. Worthington

10th September, 1987

ANNEXURE 1

Status of DMP Recommendations from 2-3 April 1987 Meeting

DMP Recommendation		PCOM Action/Response
1987/1	DMP decision making should be driven by the following philosophy...	Consistent with PCOM sentiment.
1987/2	VSP should not be a routine experiment on the ODP drill ship.	PCOM agrees that it should not be a routine experiment. However, at present a DMP recommendation to have VSP as part of the scientific program for a given hole will not be implemented if an investigator with a funded program does not come forward. Ask for clarification of intent. (2,28) (n.b. why are magnetometers, recommendation 11, treated differently from VSP? A consistent policy needs to be formulated. (28)). Further consideration scheduled for 26-28 August meeting.
1987/3	More risk should be taken in deploying geochemical/neutron tool through the pipe.	Logging operator reports that TAMU has agreed to accept more risk (E). Further consideration scheduled for 26-28 August meeting.
1987/4	A more realistic definition of an acceptable level of risk should be formulated.	Will review success with new operational approaches (E). Further consideration scheduled for 26-28 August meeting.
1987/5	Time should be made available for a dedicated comparison of nuclear logs in and out of pipe.	Not raised by Langseth. See recommendation 20. Further consideration scheduled for 26-28 August meeting.
1987/6-8	Establish a technical working group on physical properties. Recommended members. Recommended frequency of meeting and group life.	A small *ad hoc* group was established to meet once to formulate recommendations to be forwarded through DMP. A permanent group was not considered necessary, analogous to the past situations, for example, with organic geochemistry, inorganic geochemistry. Budgetary impacts of new tools are a concern.
1987/9	Reiterates that TAMU Ops Superintendent must insure that logging directives are followed.	Will review success with new operational approaches. (E)
1987/10	Reiterates that as TAMU is responsible to provide logggable hole, program to investigate alternative mud systems is welcome.	No action required.

1987/11	Establishes priorities for logging technology developments/acquisitions.	Discussion of specific FY88 priorities led to a general discussion of the role of special experiments in the drilling program in light of drilling time limitations, budget in general. Not resolved, seek input from panels (thematic and DMP) on this policy issue. (28)
1987/12	Leg 115 program: standard Schlumberger suite in three deepest holes.	All recommendations adopted. (17)
1987/13	Leg 116 program: standard Schlumberger suite, and BF-1: BHTV BF-3,4: BHTV, temp, Kuster, packer BF-2,5: Kuster	All recommendations adopted. (18)
1987/14	Leg 117 program: standard Schlumberger suite, Barnes water sampler (if available) and NP-6,7: BHTV NP-6: VSP	All recommendations adopted, except use of BHTV upon advice of the logging operator (citing need to assure that a working tool available for Leg 118). (18)
1987/15-16	Leg 118 program: standard Schlumberger suite, BHTV/magnetometer, MCS, gyro magnetometer, susceptibility, packer, wireline packer or Kuster, complex resistivity, dual laterolog, flow meter, VSP and backup priorities.	Recommendations discussed favorably and time available, but not formally adopted. Liaison will have clarified. (19)
1987/17	Leg 119/120 program: standard Schlumberger suite, and KHP-1,SKP-6B: BHTV KHP-3,SKP-3: VSP	SKP-3 VSP approved. KHP-1 BHTV approved. KHP-3 hole assigned low priority in drilling plan so VSP moved to KHP-1. SKP-6B site contingent on Prydz Bay weather. (15-17)
1987/18	With respect proposal 272/F: consideration be given to placement in NK-2 or dedicated geotechnical hole.	With what priority, what operational times involved?
1987/19	New members.	Per 6/87 JOIDES Journal, the four nominees have accepted appointment.
1987/20	Next meeting date, time.	Accepted by PCOM Chairman, however scheduling panel meetings so close before PCOM impedes communication. It is very difficult to focus on panel recommendations when they are not available in the form of meeting minutes.

REPORT ON JOI-USSAC WORKSHOP

ON

WELLBORE SAMPLING

Airport Holiday Inn, Houston, Texas

27 - 29 May, 1987

1. PURPOSE

(i) To air technology in different sampling disciplines.
(ii) To identify deficiencies in current technology.

2. TECHNOLOGY REVIEW

(i) Solid/Geotechnical Sampling (B. Bryant, Texas A&M University)

HPC/APC has led to much improved core samples especially in sediments. These are of very high quality as regards exposition of sedimentary structures. Sampling quality is enhanced in low-permeability regimes, e.g. sediments containing smectites, where a more representative sample of rock and fluid can be obtained.

Geotechnical properties of interest are density, velocity, water content, porosity, permeability, compaction and consolidation properties. Remoulding of core due to change of stress regime on core recovery has been well studied. For sampling the geotechnical industry uses a 40 inch sampler in the form of a thin brass tube. This cannot be implemented at sea.

(ii) Petrology Sampling (R. Batiza, Northwestern University)

Rocks are classified as igneous, sedimentary, metamorphic and chemical (e.g. evaporites).

Sampling objectives: ridge crests and seamounts, fracture zones, deep crust, active margins, palaeo-environments

Sampling problems: hole advancement rate, recovery, ultra-deep penetration, rubble, heterogeneous rock, interfaces, unconsolidated rock.

Drilling problems - igneous rocks:
Basalt flows; drilling problems when young (cracked, rubbly) or thin (contacts). Gabbro - periodite; drilling problems when altered (heterogeneous) or rubbly.

Some of these problems manifest themselves through void occurrence (e.g. near ridge crests) and in distinguishing flows and sills for which purpose the contact needs to be recovered.

Drilling problems - sedimentary rocks:
unconsolidated materials (e.g. sand, sand-silt sequences, heterogeneous materials), chert-chalk sequences, conglomerates, breccias.

Technical needs:
Ways of overcoming problems of generic rubble, soft/hard sequences, unconsolidated sands, and hole stability.

(iii) Sampling for Physical Properties (Paul F. Worthington, British Petroleum Company/Chairman JOIDES Downhole Measurements Panel)

Physical properties measurements on core material are made in support of well log data and to complement laboratory petrochemistry. If these measurements are to be representative of the in-situ formations it is imperative that the material be preserved to avoid dehydration. This is especially important in argillaceous sediments. Physical properties are measured on cylindrical plugs or offcuts according to the parameter sought and the technique used. A typical suite of parametric values might be: porosity, permeability, electrical resistivity, compressional and shear velocities, cation exchange capacity and density. In addition measurements made on "continuous" whole core can furnish natural radioactivity. The policy of core splitting currently in use in ODP precludes the acquisition of cylindrical plugs. This policy will have to be changed if good shipboard physical properties measurements are to be forthcoming. Plug material should be stored under brine to allow more detailed scientific studies at a later date.

(iv) Pore Fluid Sampling (Ross Barnes, Rosario Geoscience Associates)

Methods: Squeeze out or displace fluid from core.
Problems: (a) drilling fluid contamination
(b) temperature and pressure changes
(c) hole itself affects the hydrogeological regime

Alternative is to sample downhole but fluid contamination remains. Packers have led to advances in sampling capability. Another alternative is in-situ sampling (filtering fluid out of sample in-situ and encapsulating it) which is useful in unconsolidated sediments. In DSDP/ODP we have mainly used squeezing and filtration methods. The latter has strong advantages when gas is present. A key outstanding problem is how to sample pore water from consolidated sediments.

(v) Borehole Fluid and Gas Sampling (Lisa Shevenell, Los Alamos Natl. Lab)

Principal interest at LANL is in-situ sampling of geothermal wells. Geochemical sampling seeks major and trace elements, stable isotopes, gas, carbon 13 content of CO_2 in water, tritium.

Tools used by LANL

(a) Pre-evacuated type sampler - 1,2 and 4 litre capacity, 350°C
(b) Flow - through samplers - 1 litre capacity, 200-350°C
(c) Gas extraction system

(vi) Pressure Gas Sampling (Keith Thompson, Texas A&M University)

Aims are indicators of petroleum proximity, methane/ethane ratios, concentration gradients, compositional anomalies and diffusion envelopes; e.g. methane/ethane < 200 suggests hole is approaching mature source rock or reservoir. Need an extraction process for light hydrocarbons which will allow investigation of alternative reservoir proximity indicators, especially for ODP use.

Sources of contamination of organic geochemical samples are shipboard petroleum products, plasticisers in core liners, light hydrocarbons in chemistry laboratory itself, pyrolysis products in core barrel. Remedial actions for ODP would be to investigate a sidewall coring device for ODP and to enhance the routine shipboard organic analytical programme.

(vii) Drilling in Glaciers (W. Harrison, University of Alaska)

Two primary objectives are ice coring for palaeo-environment and location of base of glaciers. We currently have little knowledge of the morphology of glaciers, the motion of fluids, the water pressure at the base, and movement phenomena. There are great difficulties in sampling to resolve these issues.

(viii) Gas in Sediments (Jean Whelan, Woods Hole)

In ODP context key issues are ship safety, extent of gas hydrates, potential effects on atmospheric methane, definition of petroleum seeps, contribution of mantle gas, definition of Redox boundaries (past depositional processes), initial indication of high permeability horizons, and sediment stability at continental slopes and rises. We need a sampler which is easy to use and reliable so that many measurements can be made over a wide area.

(ix) Mining Sampling Technology (Scott Evans, Christensen Mining Products)

Major advances in 1980s have been in the area of wireline coring. Advantages include precise core orientation.

(x) Deep Sampling, Siljan, Sweden (J. Castano, GRI-Vattenfall)

Deep hole to test hypothesis of biogenous gas in the mantle. Continuous coring out of the question (Hole currently 6100 m deep). Integrated use of logs and core is therefore a priority. Core recovery generally poor. Gearhart sidewall coring tool has a very significant application : it has functioned well at 7 out of 8 drill levels in adverse conditions. Little gas encountered to date.

(xi) Fluid Sampling : State of the Art (Tom Torgerson, University of Connecticut)

Review of experience in DOSECC hole at Cajon Pass adjacent to San Andreas Fault. Primary purpose is to resolve the heat flow/stress paradox along the San Andreas. A major objective is to characterize the pore fluid chemistry with respect to major rock types, fracture-plane rock types and mixing (of water types/drilling fluids). Key factors are the dissolved gas and isotope contents.

Two samplers were used:

(a) Kuster subsurface sampler with pianowire line, evacuated, timer-controlled operation with opening/closing in response to differential pressure.

(b) LBL downhole fluid sampler with electrical wireline, lowered open and closed electrically.

Difficulties were overuse of samplers and high failure rate, because of inexperience of operators. Also with 250 ft of open hole, source of fluid was never clearly known.

(xii) Wireline Pump Tester (Bob Blake, Amoco)

This is an electrically powered fluid tester through which two gallons per minute can be pumped past eH and pH meters. When purging seems complete, R_w electrodes are switched in for additional confirmation. Tool can take four samples working from lowest position upwards. Additional applications are formation pressures, permeability measurement, formation temperatures.

Tool is far less expensive and better instrumented than DST and is vastly superior to RFT which does not provide good fluid samples.

(xiii) Pressurized Sampling (Kay Emeis/Dave Huey, ODP/TAMU)

Need to improve design to recognize minute changes in chemical composition for both safety (volume/volume ratio of sediment and hydrocarbon gases) and science (gas abundance and production in marine sediments, physical properties of marine sediments, recognition of ephemeral biogenic tracers and unstable components).

DSDP wireline core barrel has been withdrawn. APC and XCB have been developed subsequently. PCB must be developed to be compatible with these bottom hole assemblies. Project is at planning stage. Pressure core barrel could include transducers, conductivity probe, radiation sensors, etc. Current targets are variable (100 - 3000 cc) sample size, staged pressure capability (up to 13000 psi), and sample access in stages for (a) gas only, (b) core measurements (c) subsampling under pressure.

3. WORKING GROUP REPORTS

Working groups were briefed to report on major scientific needs in sampling, the technology required to meet these needs, and identification of priorities.

(i) Sample Handling and Preservation

Scientific needs are:

(a) better recovery of unconsolidated sediments;
(b) to identify where all core in barrel originated;
(c) an agreed protocol for core preparation, handling, measurement;
(d) an archiving/storage system to keep core preserved at least for several years.

Technology required is:

(a) Design of core barrel to optimize collection of unconsolidated rock, perhaps with valve system for drawing off gases;

(b) development of core barrel of low atomic No. (for X-radiography), e.g. PVC;

(c) transponder within core barrel to monitor rate of advancement of core within barrel;

(d) Gamma ray monitors at entry to core barrel, one looking in, the other looking out, mutually shielded, i.e. MEASUREMENT - WHILE - CORING;

(e) A mobile plugging unit for cylindrical core plugs;

(f) archiving facility for core and plugs, e.g. impermeable wrapping materials for former, anaerobic-jar storage for latter;

(g) Protocol to include:
assignment of dedicated staff
instant response to recovered core barrel
definite procedural practice
strain relaxation
core orientation
X-radiography of core whilst in liner
relinquishment of whole core where appropriate
plugging at regular intervals, vertically and horizontally
splitting with instant preservation
systematic archiving

Priorities (in order) are:

(1) Low atomic No. core barrel liner assembly
(2) Measurement while coring
(3) Repository for preserved material
(4) Mobile plugging unit

(ii) Pressure Coring

Technological steps are:

(a) Cartridge system with following characteristics:
- return material under pressure;
- of manageable size and weight;
- maintain system at nominal pressure which might not be in-situ pressure.

(b) Return material under in-situ pressure.

In itself item (a) would be a significant step forward, especially as regards safety. For example, we need to recognize when hydrates have been recovered, to avert potentially dangerous situations.

Pressure coring is not going to be used for hard rock: it is needed for improving the integrity of subsequent physical properties and geotechnical measurements in sediments.

(iii) Contamination/Decontamination

General -

(i) keep good records during sampling;
(ii) make good analyses before additives added;
(iii) redundant sampling advantageous;
(iv) if contaminants have to be tolerated, they should be well defined and traceable;
(v) define what is tolerable.

Problems of Sampling Rocks -

(a) Drilling Additives

(i) barite/bentonite - trace and major element chemistry
(ii) pipedope - organics

(b) Storage problems

Problems of Sampling for Micro-organisms:

(a) Drilling fluid
(b) Contamination interval
(c) Surfactants

Potential solutions

(i) Pressure coring and retrieval
(ii) Investigate environment prior to sampling for characterization.

Problems of Sampling for fluids (water and gases)

(a) Most problems solved by in-situ measurements preferably made continuously so that one can:

(1) Separate solids/fluids
(2) Monitor fluid changes

(b) Remaining problems are associated with:

(1) Consolidated and unconsolidated sediments;
(2) Contamination from sampler.

Water : investigation of rock fluid interactions

Problems are (1) drilling fluids
(2) Core disturbance
(3) Influence of container
(4) Tracer metal contamination
(5) Contamination between zones
(6) Drillstring contamination
(7) Surfactants

Gases

(1) Often a good gas sample is associated with a good water sample.

(2) Problems are

- reactive gases (e.g. H_2, sulphur gases)
- drilling fluid entrained gases
- hydrocarbon gases (fuels, pumps, etc.)

(3) Gas contaminants should be purged.

(iv) Fluid Sampling/In-situ Chemical Analysis

(a) Scientific needs:

Representative samples needed for thermo-modelling and water sampling.

Artefacts/problems:

- Contamination - materials
  - drilling fluid

- Volume contraction/flashing
- Precipitation/gas loss
- Location/source of fluid

For in-situ analyses:

(1) Most important parameters are:

(i) T, Pressure, Conductivity, Turbidity
(ii) pH, eH

(2) Other specific techniques needed, e.g. a particular elemental concentration.

(3) Drilling fluid tracer required (for assessing drilling fluid contamination).

(b) Technological Requirements

(1) Fluid samplers - material specifications required:

(i) 400°C (450°C)
(ii) high salinity
(iii) ph 1 -12
(iv) depths 6 - 15 km
(v) 1 - 2 litres
(vi) 1" - 2" diameter
(vii) non contaminating material, e.g. titanium, special alloys

(2) Design

(i) flow-through or syringe
(ii) stackable with in-situ instrument or combination with in-situ probe
(iii) Dewar electronics

(c) Priorities

(1) Sampler with minimum no. of artefacts

(i) for high T geothermal systems
(ii) for lower temperature formation waters

(2) In-situ probes

(i) pH is the master variable
(ii) T, pressure, conductivity (off shelf)
(iii) contamination probe/tracer
(iv) Future - individual probes for particular chemicals

(d) Dream Lists

(1) High temp cables
(2) Downhole - gas chromatography
- mass spectrometers
(3) Large sampling volume (20 litres) for radioisotopes
(4) Pumping systems for low permeability zones

(vi) Unconsolidated Rocks

(a) Scientific Issues

Unconsolidated materials are clays, sands, silts

(1) Max sample recovery with little or no deformation. Maintain the in-situ state.

Solutions: pressure core;
solidify ahead of bit then core "solid" so formed.

(2) Handling and preservation to maintain core integrity, e.g. cementing, freezing, pressurized.

(3) Quality control techniques to quantify degree of disturbance.

(4) Core orientation - difficult to scribe unconsolidated material.

(5) Limit any contamination.

(b) Technology Required

(1) Unconsolidated material - always use a heave-compensated drill string.

(2) Core orientation.

(3) Avoid boundary distortion.

(4) Very high drilling speeds (as in mining).

(5) Acoustic sensor to monitor material as it enters core barrel, rotation speed, etc.

4. REPORTING

A report is being prepared by co-convenors R.K. Traeger and B. Harding for general circulation.

Paul F. Worthington

Paul F. Worthington

5th June, 1987

LIST OF PROPOSALS RECEIVED BY THE JOIDES OFFICE (as of October 1987):

#	THEME/AREA	AUTHOR(S)	RECEIVED (**bold=last version**)
1/A*	Pre-m. Cretac. history of SE Gulf of Mexico	(Phair & Buffler)	12/82
2/E	Middle America trench and Costa Rica margin	(Crowe & Buffler)	12/82
3/E	Flexural moats, Hawaiian Islands	(Watts et al.)	**11/85**
4/E	Tuamoto Archipelago (French Polynesia)	(Okal et al.)	6/83
5/A	Struc.& sedim. carbonate platforms	(Mullins et al.)	7/83
6/A	Labrador Sea, ocean crust & paleoceanogr.	(Gradstein et al.)	**5/84**
7/A	Gulf of Mexico & Yucatan	(Buffler et al.)	8/83
8/E	Southern Chile trench	(Cande)	9/83
9/A	Pre-Messinian hist. of the Mediterranean	(Hsu et al.)	1/84
10/A	Cenozoic circulation off NW Africa	(Sarnthein et al.)	**4/85**
[11/A	Porto & Virgo seamounts, Iberian margin	(Kidd et al.)	1/84]
12/A	Tyrrhenian back-arc basin transect	(Cita & Malinverno)	1/84
13/F	Water column research lab	(Wiebe)	1/84
14/E	Zero age drilling: EPR 13°N	(Bougault)	1/84
15/A	Formation of the Atlantic Ocean	(Herbin)	1/84
16/A	Atlantic-Mediterranean relationship	(Faugeres)	1/84
17/A	Gorringe Bank, deep crust & mantle	(Mevel)	1/84
18/A	Off Galicia Bank	(Mauffret et al.)	**6/84**
19/A	Eleuthera fan, Bahamas	(Ravenne & Le Quellec)	1/84
20/A	Subduction collision: Outher Hellenic Arc	(J.Mascle)	1/84
21/A	Thyrrenian Basin: Rifting, stretching,accr.	(Rehault & Fabbri)	**7/85**
22/A	Rhone deep sea fan	(Bellaiche et al.)	1/84
23/A	Carribean basins	(A.Mascle & Biju-Duval)	1/84
24/A	Barbados transects	(A.Mascle & Biju-Duval)	1/84
25/D	New Hebrides arc	(ORSTOM team)	1/84
26/D	Tonga-Kermadec arc	(Pelletier & Dupont)	**6/86**
27/D	Sulu Sea marginal basin	(Rangin)	**7/85**
28/D	South China Sea	(Letouzey et al.)	1/84
29/D	Ryukyu Island & Okinawa backarc basin	(Letouzey)	1/84
30/B	Davie Ridge & Malagasy margin, Indian Ocean	(Clocchiatti et al.)	**8/85**
31/B	Red Sea, paleoenvironmental history	(Guennoc)	1/84
32/A	Yucatan basin	(Rosencrantz & Bowland)	1/84
33/A	Mediterranean drilling	(Hsu) [same as 9/A]	
34/E	Pacific-Aleutian-Bering Sea (Pac-a-bers)	(Scholl & Vallier)	2/84
35/A	Barbados ridge accretionary complex	(Westbrook)	2/84
36/A	Norwegian Sea	(Hinz & Norw.WG)	**5/84**
37/E	Costa Rica, test of duplex model	(Shipley et al.)	**8/84**
38/A	Gulf of Mexico (DeSoto Canyon)	(Kennett & Moore)	2/84
39/A	Cape Verde drilling	(Hill)	2/84
40/A	Logging of site 534 (Blake-Bahamas basins)	(Sheridan et al.)	2/84

* A = Atlantic, B = Indian O., C = Southern Oceans,
D = W-Pacific, E = Cepac

41/A	N Barbados forearc: Struc. & hydrology	(C.Moore)	3/84
42/D	Sunda Straits area	(Huchon)	3/84
43/D	SW Pacific drilling outline	(Falvey)	3/84
44/B	Andaman Sea: Tectonic evolution	(Peltzer et al.)	3/84
45/A	Equatorian Atlantic: Paleoenvironment	(Ruddiman)	3/84
46/D	South China Sea margin history	(D.Hayes et al.)	2/86
47/D	Manila trench, S.China Sea	(Lewis & Hayes)	3/84
48/D	Sulu Sea & South China Sea	(Hinz & Schlueter)	12/85
49/D	Eastern Banda arc/Arafura Sea	(Schlueter & Fritsch)	3/84
50/D	Nankai trough & Shikoku forearc	(Kagami et al.)	8/85
51/D	Sea of Japan	(Tamaki et al.)	7/85
52/D	Solomon Sea	(Milsom)	3/84
53/F	Vertical Seismic Profiling	(Phillips & Stoffa)	3/84
54/C	Sub-Antarctic & Weddell Sea sites	(Kennett)	3/84
55/B	Makran forearc, Pakistan	(Leggett)	3/84
56/B	Intraplate deformation	(Weissel et al.)	10/84
57/B	Deformation of African-Arabian margin	(Stein)	10/84
58/A	West Baffin Bay	(Grant & Jansen)	3/84
59/A	Continental margin instability testing	(Weaver & Kidd)	8/84
60/A	Newfoundland basin: E Canadian margin	(Masson)	4/84
61/B	Madagscar & E Africa conjugate margins	(Coffin & Matthias)	10/84
62/B	Davie fracture zone	(Coffin et al.)	12/84
63/A	[idea proposal]		
64/A	Site NJ-6	(Poag)	6/84
65/B	S.Australian margin: Magnetic quiet zone	(Mutter & Cande)	10/84
66/F	Laboratory rock studies to reveal stress	(Whitmarsh)	9/87
67/D	Tonga-Lord Howe Rise transect	(Falvey et al.)	7/84
68/A	Deep basins of the Mediterranean	(Montadert)	7/84
69/F	Rock stress meas. in part of Norwegian Sea	(Stephansson)	7/84
70/F	Borehole seismic experim. at 417 & 603	(Stephen et al.)	7/84
71/C	[idea proposal]		
72/A	Two-leg transect on Lesser Antilles forearc	(Speed et al.)	7/84
73/C	Antarctic margin off Adelie coast	(Wannesson et al.)	8/85
74/A	Continental margin of Morocco, NW Africa	(Winterer & Hinz)	8/84
75/E	Gulf of California	(K.Becker et al.)	8/84
76/E	EPR: oceanic crust at the axis	(Francheteau & Hekinian)	9/87
77/B	Seychelles bank & Amirante trough	(Mart)	8/84
78/B	Indus fan	(Kolla)	8/84
79/B	Tethyan stratigraphy & oceanic crust	(Coffin & Chanell)	8/84
80/D	Sunda & Banda arc	(Karig & G.Moore)	10/84
81/A	Ionian Sea transect, Mediterranean	(Hieke & Makris)	9/84
82/D	Sulu Sea	(Thunell)	9/84
83/D	Izu-Ogasawara (Bonin) arc transect	(Okada & Takayanagi)	4/86
84/E	Peru margin	(Kulm & Hussong)	9/84
85/A	Margin of Morocco, NW Africa	(D.Hayes et al.)	9/84
86/B	Red Sea	(Bonatti)	9/85
87/B	Carlsberg Ridge, Arabian Sea: Basalt obj.	(Natland)	10/84
88/B	Chagos-Laccadive-Mascarene volc. lineament	(Duncan et al.)	5/85
89/B	SWIR, mantle heterogeneity	(Dick & Natland)	5/86
90/B	SE Indian Ocean Ridge transect	(Duncan)	10/84

91/B	SE Indian Ocean oceanic crust	(Langmuir)	10/84
92/B	Crozet Basin, seismic observatory	(Butler & Brocher)	**8/85**
93/B	W Arabian Sea: upwelling, salinity etc.	(Prell)	10/84
94/B	Owen Ridge: History of upwelling	(Prell)	10/84
95/B	Asian monsoon, Bay of Bengal	(Cullen & Prell)	10/84
96/B	Bengal Fan (Indus & Ganges Fans)	(Klein)	10/84
97/B	Equatorial Indian Ocean:Fertil.& carb.comp.	(Peterson)	**7/85**
98/B	History of atmosph. circ. (Austral. desert)	(Rea)	10/84
99/B	Agulhas Basin paleoceanogr. clim. dynamics	(Coulbourn)	10/84
100/B	SE Indian Ridge transect: Stratigr. section	(J.Hays & Lazarus)	10/84
101/B	Ridge crest hydrothermal activity	(Owen & Rea)	10/84
102/B	Somali Basin	(Matthias)	10/84
103/B	Laxmi Ridge, NW Indian Ocean	(Heirtzler)	10/84
104/B	90°E Ridge transect	(Curray & Duncan)	10/84
105/B	Timor, arc-continent collision	(Karig)	10/84
106/B	Broken Ridge, Indian Ocean	(Curray et al.)	10/84
107/B	SE Indian Ridge: Stress in ocean lithosph.	(Forsyth)	10/84
108/C	E Antarctic continental margin (Prydz Bay)	(SOP)	**5/87**
109/C	Kerguelen - Heard Plateau	(SOP -Kennett)	10/84
110/C	Wilkesland - Adelie continental margin	(SOP -Kennett)	10/84
111/C	SE Indian Ocean Ridge transect (subantarc.)	(SOP -Kennett)	10/84
112/B	Lithosphere targets	(SOP -Kennett)	10/84
113/B	Agulhas Plateau	(SOP -Kennett)	10/84
114/C	Crozet Plateau	(SOP -Kennett)	10/84
115/B	Agulhas Plateau and adj. basins	(Herb & Oberhansli)	**4/85**
116/B	90°E & Chagos-Laccadive Ridge drilling	(Oberhansli & Herb)	**4/85**
117/B	Northern Red Sea	(Cochran)	10/84
118/B	Cenozoic history of E Africa	(Kennett et al.)	11/84
119/B	Early opening of Gulf of Aden	(Stein)	12/84
120/B	Red Sea, Atlantis II deep	(Zierenberg et al.)	12/84
121/B	Exmouth & Wallaby Pl. & Argo Abys. Plain	(Von Rad et al.)	**5/86**
122/A	Kane fracture zone	(Karson)	12/84
123/E	Studies at site 501/504	(Mottl)	12/84
124/E	To deepen Hole 504B	(LITHP -K.Becker)	1/85
125/A	Bare-rock drilling at the Mid-Atl. Ridge	(Bryan et al.)	1/85
126/D	Drilling in the Australasian region	(Crook, Falvey,Packham)	1/85
127/D	E Sunda arc & NW Austral. collision	(Reed et al.)	1/85
128/F	Phys.props. in accretionary prisms	(Karig)	1/85
129/C	Bounty trough	(Davy)	**5/86**
130/D	Evolution of the SW Pacific (N of New Zeal.)	(Eade)	1/85
131/D	Banda Sea basin: Trapped ocean crust etc.	(Silver)	3/85
132/D	TTT-type triple junction off Boso, Japan	(Ogawa & Fujioka)	**6/85**
133/F	In-situ sampling of pore fluids	(McDuff & Barnes)	3/85
134/B	Gulf of Aden	(Girdler)	**4/86**
135/B	Broken Ridge: Thermo-mechanical models	(Weissel & Karner)	3/85
136/C	Kerguelen - Heard Plateau	(Schlich et al.)	**7/85**
137/B	Fossil ridges in the Indian Ocean	(Schlich et al.)	**8/85**
138/B	Rodrigues triple junction, Indian Ocean	(Schlich et al.)	**8/85**
139/B	Agulhas Plateau, SW Indian Ocean	(Jacquart & Vincent)	**8/85**
140/B	Central & N. Red Sea axial areas	(Pautot & Guennoc)	**8/85**

141/B	Indus Fan	(Jacquart et al.)	**8/85**
142/E	Ontong-Java Pl.:Equat. Pacific depth trans.	(L.Mayer & Berger)	4/85
143/F	In-situ magnet. susc. measurements	(Krammer & Pohl)	**12/85**
144/D	Kuril forearc off Hokkaido: Arc-arc collis.	(Seno et al.)	**6/86**
145/D	Ryukyu arc: Left-lateral dislocation	(Ujiie)	**6/86**
146/D	Toyamu fan, E Japan Sea	(Klein)	**7/85**
147/D	South China Sea	(Wang et al.)	6/85
148/D	Near TTT-type triple junction off Japan	(Ogawa et al.)	6/85
149/D	Yamoto Basin, Sea of Japan: Active spread.	(Kimura et al.)	**6/86**
150/B	90°E Ridge & Kerg.-Gaussb.Ridge: Hard rock	(Frey & Sclater)	7/85
151/D	Japan Sea: Mantle plume origin	(Wakita)	7/85
152/F	Borehole seismic experim., Tyrrhenian Sea	(Avendik & Dietrich)	7/85
153/E	Three sites in the SE Pacific	(J.Hays)	7/85
154/D	Banda-Celebes-Sulu basin entrapment	(Hilde)	7/85
155/F	Downhole measurem. in the Japan Sea	(Suyehiro et al.)	7/85
156/D	Kita-Yamam. trough, Japan Sea: Massive sulf.	(Urabe)	7/85
157/D	Japan Sea paleoceanography	(Koizumi & Oba)	7/85
158/D	Japan Sea & trench: Geochem & sedimentol.	(Matsumoto & Minai)	7/85
159/F	Phys.cond. across trench: Izu-Mariana-...	(Kinoshita et al.)	7/85
160/F	Geophys.cond. of lithosp.plate, Weddell Sea	(Kinoshita et al.)	7/85
161/F	Magn.field & water flow measurem.	(Kinoshita et al.)	7/85
162/F	Offset VSP on the SW IO Ridge fract.zones	(Stephen)	7/85
163/D	Zenisu Ridge: Intraplate deformation	(Rangin et al.)	7/85
164/D	Japan trench & Japan-Kuril trenches juntion	(Jolivet et al.)	7/85
165/D	Shikoku basin ocean crust	(Chamot-Rooke & LePichon)	7/85
166/D	Japan Sea: Evolution of the mantle wedge	(Tatsumi et al.)	7/85
167/D	Okinawa trough & Ryukyu trench	(Uyeda et al.)	**6/86**
168/D	Japan Sea: Sedim. of siliceous sediments	(Iijima et al.)	7/85
169/C	South Tasman Rise	(Hinz & Dostmann)	7/85
170/D	Valu Fa Ridge, Lau Basin: Back-arc spread.	(Morton et al.)	7/85
171/D	Bonin region: Intra-oceanic arc-trench dev.	(B.Taylor)	**4/86**
172/D	Mariana forearc, arc & back-arc basin	(Fryer)	8/85
173/B	Seychelles, Mascarene Pl., NW Indian Ocean	(Patriat et al.)	8/85
174/D	Japan Sea: Forearc tectonics	(Otsuki)	8/85
175/D	Japan trench: Origin of inner wall	(Niitsuma & Saito)	8/85
176/D	S.Japan Trench: Migration of triple junct.	(Niitsuma)	8/85
177/D	Zenisu Ridge: Intra-ocean. plate shortening	(Taira et al.)	**9/87**
178/D	Nankai trough forearc	(Shiki & Miyake)	8/85
179/D	Daito ridges region: NW Philippines Sea	(Tokuyama et al.)	**6/86**
180/D	N.Philippines Sea: Kita-Amami basin & plat.	(Shiki)	8/85
181/D	Izu-Ogasaw.-Mariana forearc:Crust & mantle	(Ishii)	8/85
182/E	Sounder Ridge, Bering Sea: Stratigraphy	(Taira)	8/85
183/B	Periplatform ooze, Maldives, Indian Ocean	(Droxler et al.)	**3/87**
184/D	Papua New Guinea/Bismark Sea region	(Exon et al.)	8/85
185/C	Kerguelen Plateau: Origin, evol. & paleo.	(Coffin et al.)	8/85
186/F	SW Ind.Ocean fracture zones hydrology etc.	(von Herzen)	8/85
187/D	New Hebrides arc region, SW Pacific	(F.Taylor & Lawver)	9/85
188/F	395A boreh.geophys. & 418A drill.& geophys.	(DMP -Salisbury)	9/85
189/D	Tonga Ridge - Lau Ridge region	(Stevenson et al.)	10/85
190/D	New Hebrides (Vanuatu) arc-ridge collision	(Fisher et al.)	10/85

191/D	Solomon Isl.: Arc-plateau coll. & intra arc	(Vedder & Bruns)	10/85
192/E	Baranoff fan, SE Gulf of Alaska	(Stevenson & Scholl)	10/85
193/F	Upper ocean partic.fluxes in Weddell Sea	(Biggs)	11/85
194/D	South China Sea	(Liu et al.)	**4/87**
195/E	Bering Sea paleo-environment & -climate	(Sancetta)	12/85
196/B	90°E Ridge: Impact of India on Asia	(Peirce)	12/85
197/B	Otway Basin/W.Tasman region	(Wilcox et al.)	12/85
198/D	Ulleung Basin: Neogene tectonics & sedim.	(Chough et al.)	12/85
199/E	N.Pacific: Pelagic sedim in subarctic gyre	(Janecek et al.)	12/85
200/F	Borehole magnet. logging on leg 109 (MARK)	(Bosum)	12/85
201/F	High-precision borehole temp. measurements	(Kopietz)	12/85
202/E	N.Marshall Isl. carbonate banks	(Schlanger)	12/85
203/E	Guyots in the central Pacific	(Winterer et al.)	12/85
204/A	Florida escarpment transect	(Paull et al.)	**10/86**
205/A	Bahamas: Carb.fans, escarpm.erosion & roots	(Schlager et al.)	12/85
206/D	Great Barrier R.: Mixed carb/epiclast.shelf	(Davies et al.)	12/85
207/E	Bering Sea basin & Aleutian ridge tectonics	(Rubenstone)	1/86
208/B	Ancestral triple junction, Indian Ocean	(Natland et al.)	1/86
209/C	Eltanin fracture zone	(Dunn)	1/86
210/E	NE Gulf of Alaska: Yakutat cont. margin	(Lagoe & Armentrout)	1/86
211/B	Deep stratigraphic tests	(SOHP -Arthur)	1/86
212/E	Off northern & central California	(Greene)	1/86
213/E	Aleutian subduction: accret. controlling p.	(McCarthy & Scholl)	1/86
214/E	Central Aleutian forearc:Trench-slope break	(Ryan & Scholl)	1/86
215/B	Red Sea: Sedim. & paleoceanogr. history	(Richardson & Arthur)	2/86
216/D	South China Sea	(Rangin et al.)	2/86
217/D	Lord Howe Rise	(Mauffret & Mignot)	2/86
218/D	Manila trench & Taiwan collis.zone, SCS	(Lewis et al.)	2/86
219/B	Gulf of Aden evolution	(Simpson)	3/86
220/D	Three sites in the Lau Basin	(Hawkins)	3/86
221/E	Equatorial Pacific: L.Cenozoic paleoenviron	(Pisias et al.)	3/86
222/E	Ontong-Java Pl.: Origin, sedim. & tectonics	(Kroenke et al.)	**7/87**
223/B	Central Indian Ocean fracture zone	(Natland & Fisher)	4/86
224/E	Escanaba trough (Gorda Ridge), NE Pacific	(Fisk et al.)	**9/87**
225/E	Aleutian Basin, Bering Sea	(Cooper & Marlow)	4/86
226/B	Equat.Indian Ocean: carb. system & circul.	(Prell & Peterson)	**8/86**
227/E	Aleutian Ridge, subsidence and fragment.	(Vallier & Geist)	5/86
228/C	Weddell Sea (E Antarctic contin. margin)	(Hinz et al.)	5/86
229/E	Bering Sea, Beringian cont. slope & rise	(Cooper et al.)	5/86
230/C	Wilkes Land margin, E Antarctica	(Eittreim et al.)	5/86
231/E	North Pacific magnetic quiet zone	(Mammerickx et al.)	5/86
232/E	N.Juan de Fuca R.: High temp.zero age crust	(E.Davis et al.)	5/86
233/E	Oregon accr. complex: Fluid proc. & struct.	(Kulm et al.)	5/86
234/E	Aleutian trench: Kinematics of plate cover.	(von Huene et al.)	6/86
235/D	Solomon Sea: Arc-trench dev., back-arc ...	(Honza et al.)	6/86
236/E	N.Gulf of Alaska	(Bruns et al.)	6/86
237/E	Active margin off Vancouver Isl., NE Pac.	(Brandon & Yorath)	6/86
238/F	Pore pressure in the Makran subduction z.	(Wang & von Huene)	6/86
239/D	Two sites in the Lau Basin	(Cronan)	6/86
240/B	Argo Abyssal Plain	(Gradstein)	**7/86**

241/E	Gulf of Alaska (Yakutat block) & Zodiak fan	(Heller)	6/86
242/D	Backthrusting & back arc thrust., Sunda arc	(Silver & Reed)	**9/87**
243/D	Outer Tonga trench	(Bloomer & Fisher)	6/86
244/C	Western Ross Sea	(Cooper et al.)	**8/86**
245/E	Transform margin of California	(Howell et al.)	7/86
246/E	Mesozoic upwelling off the S.Arabian margin	(Jansa)	7/86
247/E	NE Pacific: Oceanogr.,climatic & volc.evol.	(Pisias et al.)	7/86
248/E	Ontong-Java Plateau	(Ben-Avraham & Nur)	8/86
249/E	Sedimentation in the Aleutian trench	(Underwood)	8/86
250/E	Navy fan, California borderland	(Underwood)	8/86
251/B	Seychelles-Mascarene-Saya de Mayha region	(Khanna)	8/86
252/E	Loihi Seamount, Hawaii	(Staudigel et al.)	**10/86**
253/E	Shatsky Rise:Black shales in ancestr. Pac.	(Schlanger & Sliter)	8/86
254/A	NW Africa: Black shales in pelagic realm	(Parrish & Tucholke)	8/86
255/A	Black shales in the Gulf of Guinea	(Herbin & Zimmerman)	8/86
256/E	Queen Charlotte Transform fault	(Hyndman et al.)	9/86
257/E	Farallon Basin, Gulf of California	(Lawver et al.)	9/86
258/E	Stockwork zone on Galapagos Ridge	(Embley et al.)	10/86
259/E	Meiji sediment drift, NE Pacific	(Keigwin)	10/86
260/D	Ogasawara Pl., near Bonin arc	(Saito et al.)	10/86
261/E	History of the Mesozoic Pacific Ocean	(Larson & Lancelot)	10/86
263/E	S.Explorer Ridge, NE Pacific	(Chase et al.)	11/86
264/A	Montagnais impact struct.,Scotia Sh.	(Grieve et al/Jansa & Pe-Piper)	12/86
265/D	Western Woodlark Basin	(Scott et al.)	12/86
266/D	Lau Basin	(Lau-Consortium)	12/86
267/F	Old crust at converg. margins: Argo & W.Pac	(Langmuir & Natland)	12/86
268/D	Hydrothermal ore deposition, Queensland Pl..	(Jansa et al.)	12/86
269/E	Aleutian pyroclastic flows in marine envir.	(Stix)	12/86
270/F	Tomographic imaging of hydrotherm. circul.	(Nobes)	1/87
271/E	Paleoceanogr. trans. of California current	(Barron et al.)	2/87
272/F	Long-term downh. measurem.in seas a. Japan	(Kinoshita)	2/87
273/C	Southern Kerguelen Plateau	(Schlich et al.)	3/87
274/D	South China Sea	(Zaoshu & Yan)	3/87
275/E	Gulf of California (composite proposal)	(Simoneit & Dauphin,eds)	3/87
276/A	Equat. Atlantic transform margins	(J.Mascle)	4/87
277/E	Aseismic slip in the Cascadia margin	(Brandon)	4/87
278/E	Blanco transf. fault: Alter., layer three..	(Hart et al.)	5/87
279/E	Anatomy of a seamount:Seamount 6 near EPR	(Batiza)	5/87
280/E	Cretac.Geisha Seamounts & guyots, W-Pac	(Vogt et al.)	6/87
281/D	Accr.prisms at Kuril/Japan trench & Nankai	(Okamura & Yamazaki)	6/87
282/E	Tracing the Hawaiian hotspot	(Niitsuma & Okada)	6/87
283/E	Kuroshio current and plate motion history	(Jacobi et al.)	6/87
284/E	Escanaba Trough, S-Gorda Ridge hydrotherm.	(Zierenberg et al.)	7/87
285/E	Jurassic quiet zone, W-Pacific	(Handschumacher et al.)	7/87
286/E	Return to 504B, core & log layer 2/3 trans.	(K.Becker)	7/87
287/E	Drilling in the M-Series, W-Pacific	(Handschumacher & Vogt)	8/87
288/B	Repositioning EP2 to EP12, Exmouth Plateau	(Mutter & Larson)	8/87
289/E	Mass budget in Japan arc, ^{10}Be geochem.ref.	(Sacks,Suyehiro,Imamura)	9/87
290/E	Axial Seamount, Juan de Fuca Ridge	(P.Johnson et al.)	9/87
291/E	Volcanic moat,apron in Marquesas Isl. chain	(Natland & McNutt)	9/87
292/D	Drilling in the SE Sulu Sea	(Hinz et al.)	9/87
293/D	Drilling in the Celebes Sea	(Hinz et al.)	9/87
294/D	Ophiolites in Aoba Basin, Vanuatu	(J.W.Shervais)	10/87