JOIDES PLANNING COMMITTEE MEETING
19-22 April, 1988
College Station, Texas

AGENDA

ATTACHMENTS:

JOIDES MEETING SCHEDULE

Date	Place	Committee/Panel
4-5 April*	Houston	PPSP
11-13 April	Hannover, FRG	WPAC
19-22 April	College Station	PCOM
25-27 May	Washington, DC	EXCOM/ODP Council
9-10 June *	College Station	DMP
18-19 July*	Corvallis	CEPAC
23-25 August	Oxford, UK	PCOM
14-16 September	Edinburgh, UK	EXCOM
late September*	Swansea, UK	SSP
3-7 October*	Hannover, FRG	TECP
4-6 October*	Milan, Italy	SOHP
17-19 October*	Ann Arbor	CEPAC
28 Nov - 2 Dec	Miami	PCOM/Panel Chairmen (Annual Meeting)

* Tentative meeting (not yet formally requested/approved)

(rev. 3/28/88)

ITEM C: NSF REPORT

Bruce Malfait (NSF) will report. Information from NSF which recently reached the JOIDES Office includes:

Budget:

According to NSF, the FY89 budget figure will be $ 36.0 million or a $ 0.5 million increase (1.3 %) over the FY88 budget. Given a 3-4% inflation rate per year this amount doesn't provide a steady state program.

Preliminary target budget levels for "long-term" planning are as follows:

FY90:	$ 38.0	(5.55% increase)
FY91:	$ 39.0	(2.63% increase)
FY92:	$ 40.0	(2.56% increase)

Note that negotiations between NSF and ODP member countries to increase member contribution have to be completed in order to ensure such an increase.

Other matters:

There is a chance to get more background on the long-range planning document which NSF needs by early '89. This is of some importance for the long-range planning session which is scheduled for this PCOM meeting.

ITEM D: JOI INC REPORT

Tom Pyle's report will include status of the FY89 budget development. All details of this budget are not yet worked out, but good progress is being made.

The target figure for the base budget is $36 million, a meager $ 0.5 million (1.3%) increase over last year's budget. This increase doesn't match the inflation rate, therefore posing a problem, especially as some of the budget items are considered 'non-negotiable' (e.g. ships operation). At its March meeting BCOM developed guidelines which will help overcome this problem: For the FY89 budget a portion of the 4% special operation expenses (SOE) should be used to cover standard operation costs. A strategy for recovering the 4% SOE in future years was recommended.

ITEM E: SCIENCE OPERATOR REPORT

Engineering Test Leg:

At Sunriver, PCOM requested that the Science Operator provide an outline for a 30-day engineering leg, scheduled in the Western Pacific. Note that the Leg has now been labeled "Leg 124E" (it had previously been referred to as Leg 125E). It is still scheduled between regular Legs 124 (Banda, et al) and 125 (Bonins-Marianas).

An outline of engineering tests planned for this leg is attached on p.71; it contains:

- Deepwater test of entire drilling and coring equipment (WD ca. 26,000 feet) and of positioning system of ship
- Test of diamond coring system inside ODP drill string
- XCB/NCB testing, hopefully in interbedded formations
- Run/deploy TAMU rotatable drilling packer in coring BHA
- Drill string bending tests
- Evaluation of Kevlar sandline
- Evaluation of further hybrid core bits in hard rock formations
- 3-4 days of logging equipment test performed by L-DGO group

DMP recommends conducting the following tests, adding up to a total of ca. 7 days (see p.151):

- Wireline packer (2 days)
- Wireline heave compensator (1 day)
- Formation Microscanner (1 day)
- GST through-wiring (1 day)
  (necessary to reduce standard runs from 3 to 2)
- Geoprops probe (0.5 days, assuming test of Navidrill)
- ODP rotatable packer (1.5 days)
- Side entry sub

PCOM IS ASKED TO:

I. REVIEW AND DISCUSS THE ENGINEERING TEST LEG AS OUTLINED, INCLUDING DMP RECOMMENDATIONS

II. EVALUATE WHETHER ITS PRIORITIES RE ENGINEERING DEVELOPMENTS FOR UPCOMING LEGS ARE COVERED

ITEM G: COSOD II

The final COSOD II report was distributed in January/February 1988. Xavier LePichon, COSOD II Steering Committee Chairman, intends to attend this PCOM meeting and will be available for discussion of the report.

PCOM asked the Thematic Panels to comment on the COSOD II report and provide input on priorities, implementation of recommendations, etc. The following are notes extracted from panel minutes.

<u>SOHP</u>:

SOHP finds the COSOD II report to be excellent, particularly the chapter of WG I. However, there are several concerns (see p. 268):

- WG I report does not address any sedimentological problems;
- WG III did a good job re hydrogeology; some more guidance re orogenesis/metallogenesis/sea-floor mineralization as well as re sediment diagenesis and global ocean chemistry had been expected.
- WG V recommendations are viewed as unrealistic and unproductive. It is viewed that the necessary material for recommended WG V studies can be collected in the course of following WG I recommendations.

<u>TECP</u>:

COSOD II discussions not separated from long-term planning. A White Paper is currently in preparation (see p.282).

<u>LITHP</u>:

COSOD II discussion not separated from long-term planning (see p.240).

To prepare for this meeting, PCOM members have chosen watchdog responsibilities for chapters of the COSOD II Report. It was suggested that watchdogs prepare short summaries of their WG section and provide guidance during the PCOM 'plenary' discussion of their topics.

<u>COSOD II WORKING GROUP(s)</u>	<u>PCOM WATCHDOGS</u>
I. Global Environmental Changes, &	N.Pisias
V. Evolution and Extinction of Oceanic Biota	W.Coulbourn, S.Gartner
II. Mantle-Crust Interactions	Malpas (Canada), R.Larson
III. Fluid Circulation and Global Geochem.Budget	M.Kastner, A.Taira
IV. Stress and Deformation of the Lithosphere	O.Eldholm, M.Langseth

Watchdog summaries are attached (p.72 - 80):

Furthermore you will find several other summaries, which might help to keep the discussion focussed:

(a) A table to compare priorities of COSOD I and COSOD II (does COSOD II include the basic priorities of COSOD I?) - p.81.

(b) An evaluation of which ODP legs address COSOD I priorities. - p.82.

ITEM G: COSOD II, continued

(c) A summary of COSOD II recommendations and time estimates for achieving those priorities - p.85-91.

(d) COSOD II recommendations divided into two categories (which priorities can be achieved within present engineering/budget framework? which ones require increased funding ?) - p.93.

PCOM IS ASKED TO:

I. DISCUSS THE COSOD II REPORT AND QUESTIONS OF IMPLEMENTATION OF ITS RECOMMENDATIONS

II. **RECOGNIZING THE INPUT FROM THE THREE THEMATIC PANELS, COSOD-I and COSOD-II, AND DEFINE THE LONG-RANGE SCIENTIFIC OBJECTIVES OF ODP**

- WHAT ARE THE SCIENTIFIC PRIORITIES WHICH WILL CREATE EXCITEMENT ABOUT ODP IN THE NINETIES ?

III. DETERMINE HOW TO FORWARD ITS RECOMMENDATIONS TO EXCOM

IV. CONSIDER TO PLACE ITS NEWLY DEFINED LONG-RANGE SCIENTIFIC PRIORITIES FOR ODP IN THE CONTEXT OF FISCAL REALITIES.

Some suggestions:

1. PCOM should recognize the need for a considerably increased level of funding necessary to approach many of the COSOD II objectives

2. PCOM should emphasize needs/advantages/trade-offs of the concept to charter a second vessel (a permanent support vessel? APC ship?) (e.g. Recognize the voluminous time needs - far more than 10 years - for implementing the high-priority objectives with the present ship)

3. PCOM should discuss whether it needs to prioritize the COSOD II recommendations in order to adapt them to the reality of ODP

A good approach to this problem is to develop options for implementing high-priority objectives assuming various levels of funding, such as:
- a. Slightly shrinking budget (increase does not match inflation)
- b. "Steady-state" budget
- c. Slightly increased budget (e.g. One additional member country)
- d. Increased budget (10-40% increase)
- e. Multiple platforms.

4. PCOM should find a way to address the need for increased funding for essential engineering developments within ODP budget realities.

ITEM H: PANEL STRUCTURE

At the last PCOM meeting, the subcommittee to evaluate the present panel structure met and prepared initial recommendations, which were briefly introduced to PCOM by T.Francis. With additional input the subcommittee has now presented its final report, attached on p.95.

The following is extracted from this report:

ROLES AND OPERATIONS OF THEMATIC PANELS

- Retain LITHP and TECP
- Split SOHP into two panels:
  Ocean Paleoenvironment and Biological Evolution (OPB)
  Diagenesis and Sediment Processes (DSP)

APPLICATION OF REGIONAL AND TECHNICAL EXPERTISE

- Concentrate scientific advisory responsibility in thematic panels
- Disband regional panels
- Create ad hoc Detailed Planning Groups (DPGs; with finite lifetime and formal member country representation) to:
  Provide thematic, regional and technical advice
  Plan optimal drilling schedules

FLOW OF SCIENCE PLANNING AND PROPOSALS

- COSOD(s) provide overall scientific guidance
- PCOM defines 10-year drilling plan and sets time allocations
- Thematic panels (and subgroups reporting to them) prioritize scientific problems and develop long-range prospectuses
- PCOM defines final drilling schedule

TECHNICAL PANELS

- Create a Shipboard Measurements Panel (SMP) to oversee geochemical, geotechnical and other shipboard analytical techniques
- Begin formal liaison between safety panel (PPSP) and site survey panel (SSP)

PCOM IS ASKED TO:

I. DISCUSS RECOMMENDATIONS FROM THE SUBCOMMITTEE ON PANEL STRUCTURE

II. FORWARD RECOMMENDATIONS TO THE EXECUTIVE COMMITTEE

ITEM I: SHORT-TERM PLANNING

Leg 121 (Broken Ridge/90ºE Ridge):
Co-chiefs: J.Peirce (C), J.Weissel
Sites: BR1-BR4, 90ER-2, 90ER-5 and a set of two northern sites (NNER-9, NNER-10)

PPSP:
Four optional locations on South 90ER and two on Central 90ER approved as proposed. Sites BR1-4 approved as proposed (see p.332).

DMP:
See recommendation p.149. Borehole televiewer (stress measurements) recommended at the following sites (in priority order). Recording should include some of the sediment section.

A. Site 90ER-2 (Central area)
B. Site 90ER-9
C. Site 90ER-10 (B. and C. at Northern area)

Leg 122 (Exmouth Plateau):
Co-chiefs: U.von Rad (FRG), B.Haq
Sites: EP-7, EP-10A, EP-12, EP-2A; [if EP-12 is not advisable the priority is: EP-7, EP-10A, EP2A, EP-6]

The proponents of EP-12 addressed the concerns of IOP (see letter p.327). Age combined with sedimentary facies will tell about the tectonic history of sites; an obvious difference can be expected between EP-12 and EP-7; site EP-2A is not suitable for this kind of interpretation.

PPSP:
Sites EP-6, EP-7F, EP-12 were rejected, while sites EP-2A and EP-11B were approved. Site EP-9F approved to 1300m; sites EP-9E and EP-10A approved with certain restrictions (see p.205). It was recommended to consider drilling 'twin holes' to dry industry holes after a careful evaluation of industry logs. A second review is tentatively scheduled for early April. Results will be available at the April PCOM meeting.

L.Mayer, SOHP Chairman, was consulted after the drop out of several Exmouth Plateau sites. He stated that from a SOHP perspective, drilling the approved sites is still a viable program. One option for Leg 122 is to drill all Exmouth Plateau sites including EP-9 (previously scheduled for Leg 123). Also the reentry cone for AAP-1B should be set during Leg 122. This means that leg 123 could be shortened without impact on site AAP-1B, which would satisfy co-chief expectations.

PCOM IS ASKED TO:

I. RECOGNIZE THE DEVASTATING IMPACT OF THE REJECTION OF 2-3 PRIME SITES FOR THIS PROGRAM WHICH WILL START IN JUNE 1988

II. DEVELOP A SOLUTION FOR THIS PROBLEM
Option: Rearrangement of sites and an overall shortening of the combined Leg 122-123 programs. An early start of the following Leg 124 (Banda, et al), would ensure that three sites could be accommodated within this leg, which is presently restricted to ca. 42 operational days (Christmas!).

ITEM I: SHORT-TERM PLANNING, continued

III. HELP PREVENT SIMILAR PROBLEMS IN FUTURE PLANNING - A LESSON TO BE LEARNED!

Suggestions:
1. The kind of information PPSP requires for a safety review must be more clearly defined; these updated guidelines have to be widely distributed.
2. Critical programs/legs must be flagged early (establish liaisons between SSP and PPSP, see panel structure recommendations, p.97).
3. Critical programs should undergo early safety review (e.g. Sulu Sea, Japan Sea, NEA margin, etc.).

Leg 123 (Argo Abyssal Plain):
Co-chiefs: F.Gradstein, J.Ludden (both Canada)
Sites: (EP-9E), AAP-1B

PPSP:
Site AAP-1B was approved (for EP-9 see above)

SSP:
Regarding AAP-2 (back-up site) there is a potentially serious discrepancy between plotted magnetic anomalies and their published interpretation (see p.292). Problem is pursues by SSP.

DMP:
Revised time estimates for site AAP-1B : 4.8 days for standard log., BHTV, mag./susc., VSP. DMP recommends including a specialist for packer/hydrofrac experiments in shipboard party (see p.149).

ITEM J: **WESTERN PACIFIC PLANNING**

Due to ongoing changes and conflicting information, DMP was not able to revise logging recommendations and time estimates at its last meeting. P.Worthington will meet with R.Jarrard and B.Taylor prior to the 11-13 April WPAC meeting to ensure incorporation of logging times. Updated logging times will be available at the April PCOM meeting.

Regarding downhole measurements in the WPAC programs you will find a very helpful, and greatly explanatory, document attached (p.155). It has been prepared by R.Jarrard, and will be used for the above mentioned meeting to clarify logging recommendations.

ITEM J: WESTERN PACIFIC PLANNING, continued

Leg 124 (Banda-Sulu-Celebes-S.China Seas):
Co-chiefs: E.Silver, K.Hinz (FRG)

Status: There is a limited time-window allowing only a short leg of approx. 41 days operational time. Not all six sites can be addressed in a first leg. PCOM therefore developed the following two options depending basically on availability of clearance:
- Option 1: Sites BNDA-1, BNDA-2, SCS-5;
- Option 2: Sites CS-1, SUL-5, SCS-5;

SSP:
The following concerns were expressed:

- Banda Sea: BNDA-1 is not currently drillable from a SSP perspective ('adequate' data are available for BNDA-2). Data from a recent DARWIN cruise were not yet available (short SCS lines over BNDA-1 and BNDA-2, see p.293).
- Sulu Sea: Site 5A (=SS1), as well as alternate site SS2, seem undrillable due to indications of migrating gas. Alternate site SS3 might be better but acquisition of some additional short seismic lines is recommended during an upcoming MOANA WAVE cruise (see p.293).

Early safety review is recommended (June 88 ?)

WPAC:
A new location of site SCS-5 (=SCS-5B) was recently chosen in cooperation with B.Taylor, in order to avoid problems in disputed waters (see p.207). Note: the new site has an expanded sediment section of 750 m (before: 200m). It is likely that WPAC will 'confirm' this selection at its April meeting.

TECP:
The TECP favored Sulu Sea site remains Site 5A (unchanged). The panel is not satisfied with the data presented so far in support of South China Sea site SCS-5 (see p.276).

Due to unexpected safety problems with some of the Exmouth Plateau sites, there is an option to start Leg 124 early and expand the length of the leg. This would help to ensure achievement of basement objectives and possibly allows accommodation of three sites (instead of two).

PCOM IS ASKED TO:

I RECOGNIZE SITE SURVEY PROBLEMS WITH SITE BNDA-1 AND POSSIBLE SAFETY CONCERNS OF SULU SEA SITES

II ENCOURAGE AN 'EARLY' SAFETY REVIEW OF SULU-5

III RECOGNIZE ONGOING EFFORTS FOR OPTIMIZING SITE SELECTION (WHICH MIGHT COMPLICATE CLEARANCE REQUESTS)

IV REVIEW THE CLEARANCE SITUATION OF ALL LEG 124 SITES

V CONSIDER TO EXPAND THIS LEG AND START IT EARLY (SHORTENED EXMOUTH PROGRAM!) WHICH WOULD ENSURE THE ACCOMMODATION OF 3 SITES

ITEM J: WESTERN PACIFIC PLANNING, continued

Leg 124E (Engineering Test Leg):

This topic is basically covered under ITEM E (p.4); please see an outline of planned engineering tests on p.71.

Leg 125 (Bonins & Mariana Diapirs):
Co-chiefs: P.Fryer, J.Pearce (UK)

Status: Two sites are planned on Conical Seamount (MAR-3, MAR-3A); furthermore two sites of the Bonin transect will be drilled (BON-6, BON-7). BON-7 is lowest in priority.

DMP:
An updated DMP recommendation will be available at the PCOM meeting.

SSP:
All sites okay; site MAR-3 on diapir needs core which will be taken during a SONNE cruise this summer.

Leg 126 (Bonin Transect):
Co-chiefs: B.Taylor, T.Ui (J)

Status: Four sites are planned (BON-1, BON-2, BON-5, BON-5A), completing the Bonin arc transect, which will be started during leg 125.

DMP:
Updated DMP recommendations will be available at the PCOM meeting.

SSP:
Sites okay; there are concerns that high-temperatures may be encountered at BON-1; a review of heat-flow data might be available at this meeting (see p.297)

Leg 127 (Nankai):
Co-chiefs: A.Taira (J), I.Hill (UK)

Status: Two sites are planned (NKT-1 and NKT-2) for a total estimated time of 57 days. An extensive geotechnical program at Nankai has been separated from this leg to be done at a later time if essential tools will be ready (Nankai Geotechnical leg). A request was turned down as to whether drilling at Nankai should include additional sites to address questions of geohydrology. For more details see Nankai Geotechnical program.

ITEM J: WESTERN PACIFIC PLANNING, continued

DMP:
If feasibility study is completed in time and funding ($ 150 K) for building the Geoprops probe proceed, there is a chance that the tool might be available for Leg 127 (see p.150). Specifications for a Geoprops probe test hole are: (a) it must be a Navidrill hole and; (b) there must be consolidated sediments.
[Note: DMP does not favor separating Geoprops deployment from the planned Nankai Trough drilling.]

PCOM IS ASKED TO:

I. RECOGNIZE DMP'S ADVISE REGARDING NANKAI GEOTECHNICAL PROGRAM

II. RECOGNIZE THE CURRENT STATUS OF THE GEOPROPS PROBE

Leg 128 (Japan Sea I):
Co-chiefs: K.Tamaki (J), tba.

Status: Sites J1B, J1D, J1E and J3A are scheduled for ca. 54 operational days.

SSP:

Crossing lines should be acquired during an upcoming cruise for sites J1D and J3A. Several sites have a potential safety problem (gas producing diatomaceous sequence), therefore an **early safety review** is strongly recommended.

SOHP:
Co-chief recommendations: Jim Ingle, Carolyn Isaacks, Hugh Jenkyns, Joe Morley

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Leg 129 (Japan Sea II):
Co-chiefs: K.Suyehiro (J), tba.

Status: 30 days of drilling for sites J2A and JS2 are scheduled. Approximately 11 days should be added for logging and downhole experiments.

DMP:
Recommendations plus time estimates will be available at the meeting.

SSP:
Site J2A okay, high-resolution seismics recommended for Site JS2. **Early safety review** recommended.

SOHP:
Co-chief recommendations: Jim Ingle, Carolyn Isaacks, Hugh Jenkyns, Joe Morley

ITEM J: WESTERN PACIFIC PLANNING, continued

PCOM IS ASKED TO:

I. ENCOURAGE AN EARLY SAFETY REVIEW FOR THE JAPAN SEA PROGRAM

II. RECOMMEND CO-CHIEFS FOR BOTH JAPAN SEA LEGS

FY90 PROGRAMS

Note that the final decisions for scheduling of FY90 programs must be made at the PCOM annual meeting in November/December 1988.

Nankai Geotechnical:

This leg depends on the availability of the Geoprops probe. If the feasibility study is completed in time and funding ($ 150 K) will proceeds quickly, there is a chance that the tool might be available. Note however, that DMP recommends deploying the tool not separately but in connection with drilling the planned Nankai Trough objectives.

SOHP:
A new proposal has been reviewed which addresses geohydrological problems at Nankai (see p.259). This proposal has serious deficiencies and therefore SOHP doesn't support the idea of devoting extra drilling time to this program. SOHP questions whether Nankai is more suitable than the Oregon accretionary prism. The panel recommends adding/incorporating a hydrogeology program to the existing leg 127 outline.

TECP:
New and revised proposals have been reviewed from this area (see p.277). Though there are important thematic objectives addressed, which could be done in a second Nankai leg, the proposals have obvious deficiencies. Questions arise about the significance of proposed sites. The proposals have to be revised and the need for a later review by Thematic Panels is emphasized.

It seems, that the program of this leg remains very vague, not very helpful for a (tentatively) scheduled program.

PCOM IS ASKED TO:

I. EVALUATE THE PRESENT STATUS OF THIS PROGRAM

ITEM J: WESTERN PACIFIC PLANNING, continued

Geochemical Reference Sites:

Status: LITHP previously recommended a four site program including one 'deep' basement site (BON-8) and three shallower sites near the Marianas transect of DSDP Legs 59 and 60, requiring ca. 1.5 legs. A less desirable one-leg option would contain one deep site (BON-8) and one shallow Mariana site. PCOM then charged LITHP with providing advice on a one-leg program including BON-8.

LITHP:
Recommends a two step approach (p.234):
- One leg during WPAC drilling (FY90) with shallow sites MAR-4, 5 and 6.
- One-half leg during CEPAC drilling be devoted to drill site A2-2 (replacing BON-8) on anomaly M-18 to at least 200m into basement (LITHP doesn't support to drill two M-18 sites); the second half should be used either to deepen the site or to drill site JJ-5 in the Jurassic quiet zone.

SOHP:
Supports the concept of geochemical reference sites, but thinks there are a number of problems associated with this hypothesis (see p.257). Therefore, SOHP recommends optimizing site selection for other objectives, that a strictly geochemical reference site not be drilled in WPAC and that for CEPAC an 'old crust' site would be most useful for this study.

TECP:
Drilling 'geochemical reference sites' can be combined with M-series dating and 'Jurassic quiet zone' objectives. A minimum of 4 sites is recommended: Sites A2-1 and A2-3 (both on anomaly M-18) will address M-series dating, sites JJ-5 and JJ-3 will address the oldest Pacific crust and oldest recogn. magnetic lineation respectively (see 4-page summary by proponent, p.283).

PCOM IS ASKED TO:

I. DECIDE ON THE SHAPE OF THIS PROGRAM CONSIDERING THE THEMATIC PANELS INPUT - DEFINE THE APPROPRIATE 'MINIMUM APPROACH'

South China Sea Margin:

Status: This one-leg program was tentatively scheduled pending a positive review by TECP.

TECP:
This program got a lukewarm endorsement. There is also virtually unanimous disquiet about accepting the revised proposal (46D) as it stands (see p.271 and 278).

ITEM J: WESTERN PACIFIC PLANNING, continued

SOHP:
SOHP reviewed this program, especially its suitability to address sea level history (see p. 257), a high-priority SOHP objective. In summary the panel doesn't favor the present proposal. Also, the recommended sites by far exceed the timeframe of one leg. Until considerably changed and improved it should not be included in the schedule as the time might better be used in addressing high-priority objectives in the CEPAC area.

SSP:
Available data are excellent. The panel indicated the need for further preparation of data (migration of profiles, structural maps, isopach maps, careful velocity scans and depth estimates); the proposal seems to be overly optimistic as to how much can be accomplished in one leg (see p.298).

PCOM IS ASKED TO:

I. REEVALUATE ITS (TENTATIVE) DECISION TO SCHEDULE THIS PROGRAM IN THE LIGHT OF THE NEW INPUT FROM THE THEMATIC PANELS

Northeast Australian Margin (NEA):

Status: PCOM agreed on a one leg program. The emphasis should be laid on an E-W transect of sites, covering the Australian margin and the Queensland Plateau. SOHP was asked to take care of an appropriate selection of sites.

SOHP:
The panel recommends sites as described in the new NEA prospectus, which was presented to PCOM (12 sites: NEA 1, 2, 3, 4, 5, 6, 8, 9A, 10A, 11, 13, 14; see site summary from prospectus, p.209). [Note: Slightly different recommendation than last one] If this program exceeds the one-leg timeframe, SOHP recommends dropping sites NEA-9A or NEA-10, and NEA-13. SOHP is in contact with MVT proponents to get accurate time estimates for possible 'MVT experiments' to be conducted at some of the proposed NEA sites.

SSP:
Recent survey has excellent grid over all the proposed sites. Good distribution of cores to resolve spudding in questions. Still needed is completion of processing, submission of cruise report and core description to site survey data bank, and structure and isopach maps. It is strongly recommended that a preliminary safety review be done with the site proponents (see p.298).

ITEM J: WESTERN PACIFIC PLANNING, continued

Vanuatu:

Status: PCOM agreed on a one leg program, consisting of sites DEZ 1, 2, 3, 4, 5, and sites IAB -1A, -2A.

SSP:
French seismic data is still being processed. At site DEZ-2 the existence of soft sediment for spudding in must still be demonstrated. Further velocity analysis and look at 3.5 kHz requested for this site (see p.299).

Lau Basin:

Status: A one-leg program without need of guidebase is presently favored. The following sites are tentatively being considered: LG-2, LG-1 or LG-7, LG-3 and LG-6. Final selection of sites and details of the program will be defined after additional site survey data have been acquired in 1988.

TECP:
Unchanged position: Still interested in the Lau Basin program, but one possible site in the forearc in a program designed to mainly address the volcanic history is not going to prove outstanding tectonic interest (see p.272 and 278).

SSP:
SCS line for transect at 18^{o}40'S still needed. There is a chance to get this done with the DARWIN in June 88 (L.Parson). Also a cruise with the WASHINGTON in January 89 (Hawkins) is going to this area.

A GENERAL REMARK TO THE WPAC DRILLING PROGRAM:

IT IS OBVIOUS THAT THE TENTATIVE LENGTH OF THE WPAC PROGRAM, ESPECIALLY THE LENGTH OF THE '2ND YEAR' (...) IN PART RESULTED IN A RIGOROUS LENGTH, PCOM APPLIED TO CEPAC DRILLING. PCOM IS ASKED TO RECOGNIZE THE NEW INPUT OF THE THEMATIC PANELS REGARDING WPAC PROGRAMS (see also CEPAC section).

ITEM K: CENTRAL AND EASTERN PACIFIC PLANNING

At the Sunriver meeting PCOM defined a tentative CEPAC program composed of three LITHP themes, three SOHP themes and two TECP themes (see p.60-61, PCOM minutes); one additional theme involving all thematic panels was added for possible incorporation into the Geochemical Reference Sites program, tentatively scheduled in the WPAC (see p.61). The timeframe for the CEPAC program still is considered to be 18 months. The thematic panels were asked for constructive comments.

PCOM named watchdogs for each of the CEPAC themes, much in the same manner as was done for reviewing the WPAC prospectus at Nikko. The watchdogs were asked to provide a short evaluation and should help leading a discussion on 'their' theme during the PCOM meeting. You will find watchdog reports on p.211 ff.

<u>LITHP</u>:
In response to PCOM's instructions the panel reviewed its highest-priorities for CEPAC drilling and came up with the following core program, which takes ca. 6.5 legs (details see p.240):

1.5	legs	Deepening 504B
2	legs	EPR
2	legs	Juan de Fuca/Escanaba
1	leg	Young hot spot volcanism (Loihi, Marquesas etc.)

Detailed recommendations regarding EPR drilling are given (p.236 and p.333 ff), including: A spacing of 9-12 months between two EPR legs is needed; two additional engineering half-legs are needed for essential testing and development of drilling techniques before EPR drilling can be started; if a minimum penetration of 100-200m is not achievable, then the proposed EPR drilling should **not** go forward. (Question: Is this also true for Loihi?)

4 hard-rock guidebases will be required for CEPAC drilling (incl. engineering legs).

<u>SOHP</u>:
Though the panel strongly opposes PCOM's approach to CEPAC drilling, it reviewed its priorities and came up with the following minimum program for CEPAC drilling:

Neogene paleoceanography: needs <u>at least</u> three transects:
- a. W-Equatorial transect: proposal 142/E
- b. E-Equatorial transect: proposal 221/E
- c. N-Pacific transect: Sites Meiji 1 and 2 (259/E); NW-1, 3 and 4 (199/E); PM-1A (247/E).

Mesozoic-Paleogene paleoceanography & Sealevel - atolls and guyots:
Sites OS-3 (260/D); Allison, Menard and Wilde Guyots (203/E); Sylvania and Harrie Guyots (202/E); Enewetak (202/E).(also SHAT-1 and SHAT-3, see below).

Anoxic events:
Sites SHAT-1 and SHAT-3 (253/E)

ITEM K: CENTRAL AND EASTERN PACIFIC PLANNING, continued

TECP:
The panel strongly urges that PCOM plan a drilling program that addresses its top-ranking five themes; three are of broad interest and should be planned in the context of multipurpose legs (theme 1 and 4 can be addressed in connection with geochemical reference drilling (see p.272 and 279), theme 2 also is a priority of LITHP)(see LITHP White Paper, February JOIDES Journal, p.35):

1. M-Series dating (see chapter Geochem.Ref.Sites)
2. Lithosphere flexure (Hawaiian moat preferred; also LITHP topic)
3. Ridge-trench interaction (Chile T junction)
4. Pre-70 MA plate motions (see chapter Geochem.Ref.Sites)
5. Deformation in accretionary prisms (Oregon margin of highest immediate interest)

EPR-WG:
LITHP considers the job done by EPR-WG as extremely satisfactory (see p.238). LITHP therefore recommends extending the mandate of this WG to complete a similar job with the 'Sedimented ridge drilling'. Slight changes of membership and chairmanship are necessary. See draft EPR-WG Report, p.333.

CEPAC:
The panel received input from the Thematic Panels and began to writing an updated CEPAC prospectus (see minutes, p.313). A first draft will (hopefully) be available at the PCOM meeting.

PCOM IS ASKED TO:

I. RECOGNIZE THE DISSATISFACTION OF THE THEMATIC PANELS REGARDING THE TIGHT 18 MONTHS TIME FRAME FOR CEPAC DRILLING

II. RECOGNIZE THAT THE COMBINED 'CORE PROGRAM' OF THE THREE THEMATIC PANELS IS BY FAR EXCEEDING THE 18 MONTHS TIME FRAME

III. RECOGNIZE THAT THE RIGID HANDLING OF THE 18 MONTHS TIME FRAME FOR CEPAC DRILLING REFLECTS THE LENGTH (EXPANSION) OF WPAC DRILLING - A SITUATION, WHICH MIGHT CHANGE IN VIEW OF RECENT THEMATIC INPUT (see WPAC section)

IV. DISCUSS WHETHER IT WANTS TO RECONSIDER ITS PRELIMINARY OUTLINE FOR CEPAC DRILLING, OR WHETHER THERE IS ANOTHER POSSIBLE APPROACH TO SOLVE THIS PROBLEM ('PANAMA CANAL SHUTTLE')

V. DECIDE ON LITHP'S RECOMMENDATION TO EXTEND THE MANDATE OF THE 'EPR-WG'

VI. RECOGNIZE THE NEED TO HAVE A 9-12 MONTH SPACING BETWEEN TWO EPR LEGS

VII. ENSURE THAT APPROPRIATE RESOURCES ARE DEVOTED TO ESSENTIAL ENGINEERING DEVELOPMENTS AND SPECIAL HARDWARE NEEDS
(recognize LITHP's statement that (a) 4 guidebases are required, (b) 2 additional engineering half-legs are required before the start of EPR drilling, (c) the ability for a minimum penetration of 100-200m is required for EPR; there are other requirements more)

ITEM K: CENTRAL AND EASTERN PACIFIC PLANNING, continued

VIII. FORMULATE INSTRUCTIONS TO THE THEMATIC PANEL RE THE PLANNING OF CEPAC DRILLING

IX. REVIEW THE CEPAC PROSPECTUS (IN CASE IT'S AVAILABLE AT THE MEETING) AND PROVIDE FURTHER INSTRUCTIONS TO CEPAC

ITEM L: LONG-RANGE PLANNING

1. Long-Range Planning: Pacific-Atlantic

The following aspects of this matter must be merged in order to proceed with an idea on how to tackle this issue:

1. During the annual meeting in December 88, PCOM will be asked to provide a science plan for the upcoming four years (FY90-FY93). Given the 18 month time frame for CEPAC, this plan will clearly go beyond CEPAC drilling:

   To prepare for this decision the Thematic Panels have been asked for input. They will write white papers on global thematic priorities which are projected to be available by September 88. They will (a) provide input to PCOM, (b) help inform the scientific community (by being published in the JOIDES Journal). LITHP's White Paper has already been published in the Feb.88 issue of the JOIDES Journal. You will find first outlines of SOHP and TECP white papers on p.269 and p.282.

2. For the purpose of starting negotiations with ODP member countries for the period beyond 92, NSF requested a long-range planning document from JOIDES. This document should be available in early 89.

3. The advisory structure of the program is currently under review. Changes to promote a more thematically driven program are recommended.

4. Earlier in this meeting PCOM will discuss ways of implementing highly rated scientific objectives as defined in the COSOD II report.

PCOM IS ASKED TO:

I. RECOGNIZE (SOME) INPUT FROM THEMATIC PANELS ON 'LONG-RANGE PLANNING' (See p.240 (LITHP), p.269 (SOHP), p.282 (TECP))

II. DISCUSS AND IF APPROPRIATE DEFINE TENTATIVELY INPUT FOR/ OR AN OUTLINE OF A LONG-RANGE PLANNING DOCUMENT, TO BE COMPLETED BY THE END OF THIS YEAR

or at least
PROVIDE SOME GUIDANCE ON HOW TO FURTHER PROCEED WITH THIS ITEM
DEVELOP A TIMETABLE OF STEPS FOR DEVELOPING A LONG-RANGE PLANNING DOCUMENT

ITEM L: LONG-RANGE PLANNING, continued

2. Long-Range Planning: Arctic Drilling

T.Pyle has been invited to participate in an upcoming Arctic drilling workshop in Canada. He has been asked to speak about ODP's perspective in Arctic drilling (see letter, p.307). He would therefore like some advice from PCOM with respect to this matter.

PCOM IS ASKED TO:

I. COMMENT ON ODP'S INTEREST IN ARCTIC DRILLING

II. DISCUSS/INDICATE ASPECT WHICH POSSIBLY LIMIT ITS INTEREST (such as: accessability for drillship JOIDES RESOLUTION, budget impact etc.)

ITEM M: THIRD-PARTY TOOL DEVELOPMENTS

PCOM has requested that DMP monitor the development of third-party tools, which are of interest to ODP or are planned to be deployed in ODP.

DMP recognized two types of tools (see p.142):
(a) instruments under development
(b) mature established tools

DMP came up with a detailed plan on how ODP should approach the question of third-party tools in ODP (p.142-143); this plan is up for PCOM's review.

As an immediate step each DMP member agreed to collate a list of known third-party tool developments in his country. Science operator and logging contractor also will prepare a list of planned or proposed deployment of third-party tools in future legs. There is a chance that this list will be available at the PCOM meeting.

PCOM IS ASKED TO:

I. REVIEW THE PROCEDURE SUGGESTED BY DMP RE HOW ODP SHOULD DEAL WITH THIRD-PARTY TOOL (DEVELOPMENTS)

ITEM N: PANEL MEMBERSHIP

	Rotating off:	Suggested Replacements:	
SOHP:	R.Embley	Roger Flood (LDGO) Bob Halley (USGS) P.Scholle (SMU)	
	R.Sarg	Tom Loutit (EPR)	
	P.Meyers	Eric Barron (Princeton) Judy Parrish (U.Arizona)	Paleoclimate modeler
LITHP:	J.Malpas (C) N.Peterson (FRG)	J.Franklin (C) J.Erzinger (FRG)	
TEDCOM:	J.Jarry (F) J.Kasahara (J)	J.Bonasse-Gahot (F) H.Fujimoto (J)	

[J.Lowe will be replaced by W.Cotten]

Ch.Sparks (F) recommended as new TEDCOM chairman

CEPAC:	U.von Stackelberg (FRG) H.Jenkyns (UK)	H.Beiersdorf (FRG) P.Floyd (UK)

ITEM O: MISCELLANEOUS

Co-chief selection:
At the last PCOM meeting co-chiefs for WPAC legs have been discussed. PCOM recommended names for the first two WPAC legs/programs (Banda..., Bonins). However, the Science Operator has selected co-chiefs through the Japan Sea legs (except sedimentologists for leg 129, 130). After having talked with the Science Operator it became clear that a misunderstanding took place. The Science Operator was of the opinion that the names for all the legs on the transparency were forwarded for co-chief selection.

Left-overs:
Please check the following pages for additional recommendations which tend to fall through the cracks! PCOM liaisons to the panels should take particular care that this does not happen!

DMP	see p. 139, 144, 146
TEDCOM	p. 198, 201
PPSP	p. 205
SOHP	p. 253 ff

TGIF, mw

no page no 23/24

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

DRAFT MINUTES

Members:

N.Pisias (Chairman) - Oregon State University
J.Austin - University of Texas (for T.Shipley)
G.Brass - University of Miami
W.Coulbourn - University of Hawaii
O.Eldholm - ESF Consortium
T.Francis - United Kingdom
S.Gartner - Texas A&M University
M.Kastner - Scripps Institution of Oceanography
M.Langseth - Lamont-Doherty Geological Observatory
R.McDuff - University of Washington
J.Malpas - Canada (for P.Robinson)
J.C.Sibuet - France (for J.P.Cadet)
A.Taira - Japan
B.Tucholke - Woods Hole Oceanographic Institution
U.von Rad - Federal Republic of Germany

Absent:
M.Leinen - University of Rhode Island (for R.Larson)

Liaisons:

B.Malfait - National Science Foundation
T.Pyle - Joint Oceanographic Institutions, Inc.
L.Garrison - Science Operator (ODP/TAMU)
R.Jarrard - Wireline Logging Services (Borehole Research/LDGO)

Panel/Committee Chairmen:

S.Schlanger - Central & Eastern Pacific Regional Panel
P.Worthington - Downhole Measurements Panel
R.Schlich - Indian Ocean Regional Panel
T.Moore - Information Handling Panel
C.Langmuir - Lithosphere Panel (for R.Detrick)
M.Ball - Pollution Prevention & Safety Panel
L.Mayer - Sediments & Ocean History Panel
J.Peirce - Site Survey Panel
P.Barker - Southern Oceans Regional Panel
J.Jarry - Technology & Engineering Development Committee
D.Cowan - Tectonics Panel
B.Taylor - Western Pacific Regional Panel

Guests / Observers:

P.Ciesielski - Leg 114 Co-chief Scientist
B.Duncan - Leg 115 Co-chief Scientist
M.Storms - Science Operator (ODP/TAMU)
R.Heath - University of Washington
E.Kappel - JOI, Inc.

JOIDES Office:

M.Wiedicke - Non-U.S. Liaison/Executive Assistant
S.Stambaugh - Science Coordinator
C.Moss - Office Coordinator

30 November 1987

684 WELCOME ADDRESS AND INTRODUCTIONS

N.Pisias opened the meeting and welcomed all to Oregon. After explaining meeting logistics, he introduced new and alternate PCOM members: B.Tucholke, new WHOI representative, J.Austin for T.Shipley, U.Texas, J.Malpas for Canadian representative P.Robinson (at sea with Leg 118), and J.C.Sibuet for J.P.Cadet of France. Pisias said that M.Leinen, scheduled to attend for R.Larson and URI, had sent word that she would not attend due to illness of a family member.

The Chairman then introduced new panel chairmen, T.Moore (IHP) and M.Ball (PPSP). He welcomed Charles Langmuir as alternate for R.Detrick (LITHP). B. Malfait, new NSF liaison replacing R.Buffler, was introduced. Finally, Pisias welcomed Leg 114 Co-Chief, Paul Ciesielski and Leg 115 Co-Chief, Robert Duncan.

Additional meeting papers were distributed and a list of them reviewed (Appendix A).

685 ADOPTION OF THE AGENDA

The report from the Panel Chairmen's meeting was rescheduled to precede the Annual Reports of the Chairmen. Items on ODP editorial board and role of co-chiefs were added. An item on PCOM recommendations for the 4% set aside in the FY89 budget was added.

PCOM Motion:

PCOM adopts the agenda for the 30 November - 4 December, 1987 Annual Meeting of the Planning Committee. (Motion, Francis, second Kastner)

Vote: for, 15; against, 0; abstain 0

686 APPROVAL OF PREVIOUS MINUTES

The following changes were recorded to the minutes: p.33, third line: deletion of "by NSF"; p.17, line 33: "EP9B" should read "EP9E"; p.25, third line from bottom: "MCS" should read "SCS."

PCOM Motion:

PCOM approves the minutes of the 26-28 August Planning Committee meeting, with amendments. (Motion Brass, second Langseth)

Vote: for 15; against, 0; abstain, 0

687 EXECUTIVE COMMITTEE REPORT

N.Pisias, PCOM liaison at the 5-7 October 1987 meeting of EXCOM, reported. He referred PCOM to the summary of the meeting prepared for the agenda book (Appendix B).

Pisias reported that EXCOM was supportive of the proposal review process approved by PCOM; EXCOM will review the initial report of the Panel Structure Subcommittee at its next meeting.

Pisias reviewed specific tasks before PCOM as a result of requests presented at the last EXCOM meeting for ODP planning:

1) To finalize the FY89 Science Plan for the FY89 Program plan due at JOI, Inc by the end of December, 1987;
2) To provide input to a four-year planning document required by the U.S. Science Board for continued program support; and
3) To provide specific panel structure recommendations.

Because the COSOD II draft arrived too late for PCOM review, a lengthy discussion of COSOD II was postponed until the April, 1988 PCOM meeting (See COSOD section below). EXCOM has developed a strawman schedule for incorporating COSOD II recommendations into the program (Appendix C) and suggested that the timetable be compressed if possible.

Discussion:

G.Brass requested information on the new Agenda Subcommittee designated by EXCOM. Pisias said that some members of EXCOM thought the agenda outline now in use could be more informative. They want to focus on how planning is being implemented and intend for EXCOM to focus on policy issues.

688 NSF REPORT

FY 88 Budget Developments:

B.Malfait reported for NSF. He reviewed the possible effects of the Gramm-Rudman budget reductions on NSF appropriations (up to 25% if implemented). News from Congress on the budget is expected by mid-December.

Malfait reviewed the status of the FY88 NSF/ODP budget:

FY 88 budget request	=	$31.3 M
(ODP	=	20.5 M)
(US Science	=	10.8 M)
ODP Program Plan	=	$35.5 M
(NSF-ODP	=	20.5 M)
(International	=	15.0 M)
U.S.Science	=	$10.8 M
(JOI/USSAC	=	3.9 M)
(NSF Grants	=	6.9 M)

Future budgets:

Malfait discussed the U.S.Science Support Program and budget. New activities planned to begin in FY88 are: support for acquisition of data from "ships of opportunity"; support for U.S. participation in non-U.S. site surveys; development of wireline re-entry capability; support of VSP experiments; and support for U.S. logging workshops.

Malfait presented a list of NSF funded ODP grants (Appendix D) for 1987 through early FY89. He noted that the Bonin and Nankai regional field programs for 1987 had been completed. He reported that the Old Pacific survey (Shipley and Larson) is currently at sea and reports promising data. Clearance was denied for E.Silver's cruise to Sunda/Banda and NSF has no plans to reschedule it. For 1988, funding will determine how many regional field programs are scheduled. Malfait closed with a description of and timetables for the ODP long-range planning documents needed by NSF and National Science Board review (Appendix E).

689 JOI, INC REPORT

T.Pyle reported for JOI, Inc.and distributed copies of his handouts used during his presentation. He reviewed key 1987 events, with emphasis on the final development of the FY88 Program Plan.

Review of FY88 Program Plan:

JOI accepted the IHP recommendations on the publications budget and through reprogramming of funds ($126K), typesetting of Part B and editorial staff (two editors) were added back. PCOM's concern on elimination of onboard XRF/XRD capability was addressed by reprogramming funds ($26K) to maintain XRF/XRD on priority legs. IHP had recommended data base enhancements and $26K was reprogrammed for this task.

[Note: In discussions on ODP Publications, concerns on the elimination of reprints to Part B authors arose. Although Pyle did not specify how the budget could accommodate reprogramming for this item, the following motion was forwarded and passed by PCOM.

PCOM Motion:

Fifty reprints per manuscript in the ODP Proceedings Part B should be available to authors, to be funded through a reprogramming of the remaining publication budget for FY88. (Motion von Rad, second Kastner)

Vote: for, 12; against, 2: abstain, 1

This modification to the publications budget was estimated at $9K for FY88.]

Pyle reported that the first Fellow chosen through the "Lesser Developed Countries Initiative" participated on Leg 116, and predicted that EXCOM will revive a "Third World/LDC" program in the FY89 Program Plan.

JOI and TAMU are interviewing candidates for a clearance specialist position in order to address the problem of late drilling clearances.

Status of other JOI,Inc./ US Science Support Program projects:

Pyle reviewed the status of USSAC workshop reports and presented the amended USSAC budget for FY87-90. The FY 88 funds allocated for data storage are for storing all available DSDP digital data on one CD ROM disk. Pyle said that funds for large data synthesis had been cancelled until strong support, as seen for workshops, is shown.

ODP Renewal/ FY 89 budget:

Pyle discussed the program review process, which will probably be a four-year review. Pyle reported that a review of ODP administrative costs is being conducted by outside management consultants in order to identify reasonable costs for the program. An ad hoc committee nominated by the JOI BOG will review their report.

Pyle presented a schedule for through FY88 which outlines steps in the review process including evaluation by the U.S. National Science Board. Areas of concern identified by Pyle for developing the FY89 budget include:

- stability of publication decisions
- engineering development costs
- "special operating expenses" (4%)
- international participation and clearance problems
- transfer of JOIDES Office
- panel chairmen's expenses

Discussion:

Pyle answered questions about the Lesser Developed Country Fellow program. Pyle also explained that the new USSAC program for site survey augmentation was of a size that U.S participation in non-U.S. survey cruises would most likely cover scientists' salaries, rather than significant shiptime.

690 SCIENCE OPERATOR REPORT

Leg 118 Status Report:

L.Garrison, TAMU liaison, reported on science operations, beginning with an update from Leg 118. After several attempts to spud-in at proposed SWIR sites, hardrock guidebase deployment and successful coring was achieved at Site 735B. Recovery at the site has been excellent, averaging 87%, and tests of various drill bits have proceeded. Bit life has averaged around 30 hours. A telex from the Co-chiefs indicated that Navidrill testing would follow RCB drilling.

PCOM briefly discussed Leg 118. von Rad said that this leg should serve as a lesson for the necessity of comprehensive site surveys. J.Peirce added that SSP did have reservations about the leg, which were expressed to PCOM. Brass reminded PCOM that Leg 118 was scheduled as a high-risk venture. Sibuet and Schlich asked that Leg 118 co-chiefs report to PCOM on how the scientific objectives of the leg were achieved, not the engineering successes.

Future leg scheduling:

Garrison described several changes in the operations schedule (Appendix G). The Leg 120 port was changed to Fremantle for shorter transit. TAMU has studied options for the port call based on costs, Australian requirements for union crews, and savings in transit time. Garrison said the decision to use Singapore was made on a logistics, not political basis. Leg 124 was shortened in order to avoid getting into port during the Christmas holidays, which has created logistical problems in the past.

Engineering test leg:

Garrison described upcoming technology requirements (hard rock drilling, alternating lithologies, e.g.) which will require dedicated testing. TAMU is proposing a systematic development of engineering tools and recommends consistent funding for engineering.

Garrison said that TAMU would like to link engineering and science planning by way of engineering test legs, the first of which is proposed to follow Leg 124

(See Appendix H). The 30-day leg would be combined with a long transit from Manila to Guam, thus improving logistics for the Leg 126 port. As recovery of core is expected, an abbreviated scientific party would be required. Other test legs are proposed to follow Leg 130, and tentatively scheduled before Lau Basin drilling.

Discussion:

Pisias said that LITHP had proposed the idea of engineering test legs and the scheduling of one after Leg 124 was approved by WPAC for logistics reasons. The leg would also improve the engineering planning for East Pacific Rise drilling. (See further discussion of the engineering test leg below.)

ODP Clearances:

Garrison reviewed upcoming clearances. Verbal request from the French has been obtained for Leg 119. Final Australian approval is pending for SKP sites on Leg 120. Clearances from Australia are required for Leg 122 and 123; request procedure will begin in early 1988. [The clearance situation for Leg 124 was discussed during WPAC planning.]

Garrison said that the hiring of a clearance specialist, 50% of whose time will be spent on TAMU clearance advance work, should enable TAMU to get necessary background for clearances for the Pacific.

Cruise staffing:

Garrison reviewed staffing for upcoming legs and ice boat logistics for Leg 119. Ice support for the leg is estimated at $865K; the MAERSK MASTER will be released as soon as possible if no ice problems exist or if SKP-6B is drilled instead of Prydz Bay.

Garrison concluded his presentation with a statistics on shipboard participation by member country (Appendix I).

Leg 115 Report:

R.Duncan, co-chief with J.Backman on Leg 115, reported on operations and preliminary results from drilling on the Mascarene Plateau, Maddingly Rise, and Chagos Bank. Major objectives of the leg were to determine the geochemistry and ages of hot spot volcanics and relate them to plate motion, and to achieve a Neogene carbonate depth transect.

Duncan reviewed clearance problems at the legs outset, when primary basement sites, MP1 and MP2, were denied clearance by the Mauritius government. Alternative basement sites on the Chagos Plateau were cleared through the Maldivian government. The loss of MP1, however, will leave an age gap for correlation with the Reunion volcanics. Duncan did a site-by-site review, noting hole stability problems at Site 712 and poor recovery in Eocene carbonates at Site 715.

Preliminary results from the ages and compositions of the volcanics are consistent with a model for northward motion of the Indian plate and a fixed hotspot. Although no radiometric dates are yet available, the preliminary ages agree extremely well with a model based on a fixed Atlantic hot spot. Duncan reported on geochemistry and possible source regions for the volcanics. He said that the onboard XRF performed well during the cruise.

In conclusion, Duncan noted the tremendous cooperation the operations staff had with the shipboard scientists, and he acknowledged the excellent scientific staff as well.

Discussion:

PCOM discussed reports of magnetized core barrels causing bad paleomagnetic measurements on Leg 115, 116 and 117. Duncan reported that the problem was discovered halfway through the Neogene program and was thought to have resulted from magnetization during drillpipe inspection. L.Mayer asked if non-magnetic pipe could be used in the future.

M.Storms, TAMU engineering, responded that cost for non-magnetized core barrel collars would be four times greater than standard ones as they would have to be custom made. TAMU, after limited testing, has determined that sheared set screws could be causing non-oriented core. Rig crews are being asked to check the set screws and TAMU is outlining tests and calibrations for future legs. R.Jarrard presented results from repeat passes of the Schlumberger magnetometer during Leg 117 which confirmed effects of adjacent pipe magnetization even with non-magnetized collars.

Leg 114 Report:

Paul Ciesielski, co-chief with Y.Kristoffersen, reported on results and the extreme operating conditions on Leg 114. Although the MAERSK MASTER was effectively used as an emergency fuel barge at the outset of Leg 114, Ciesielski said such operations should be avoided if possible in the future. He also reported that an operations change of chasing the core barrel with sinker bars resulted in four to five extra drilling days for the leg.

Ciesielski reviewed the paleoceanographic and stratigraphic objectives of the leg, which were to study the initiation of a deep connection between the South Atlantic and Antarctic Basins and to determine its paleoceanographic and paleoclimatic evolution of the sub-Antarctic South Atlantic. He said that they were able to obtain a valuable record of Neogene high latitude sediments, in addition to the primary Paleocene objectives.

Sites 699 and 700 drilled late Paleocene to Cretaceous sections that showed paleocirculation changes. The biggest change in surface water temperature occurred in the mid-Eocene, with cooler foram assemblages indicated by the late Eocene. Carbonate analyses from the Neogene show a major change in the late Miocene, with an influx of silicic sediments beginning about 9 Ma. Interglacials are indicated in Messinian age sediments, and the geochemical logs from the section will be used to analyze for climatic signals.

Ciesielski concluded by thanking PCOM for its support of the leg. He noted the contributions of logging for future high-latitude work, but said the wireline heave compensator should be improved for work in rough seas.

691 TAMU ENGINEERING REPORT

M.Storms gave a special report on TAMU engineering which included an overview of current major projects and future requirements for the program. Requirements for future technology development include: advanced science operations data; commitment to shipboard engineering testing; and adequate staffing/funding levels commensurate with level of technical difficulty ahead.

Storms stressed the need for advanced science operations data to better forecast budgets and manpower. TAMU would like to conduct more land tests instead of testing instruments on legs where they are needed for the science objectives. He presented a list of the types of data required:

* tentative leg numbers
* tentative dates of operation
* operating area
* anticipated weather/sea conditions
* major/minor science objectives
* anticipated number of sites/holes
* tentative site detail (water depth, sedimentary penetration depth, basement penetration, anticipated lithologies, anticipated special tool requirements and anticipated technology needs/priorities

Storms reviewed benefits of committed sea trials. He said that valuable engineering development time is lost when an engineer is on a two month cruise for a limited amount of equipment tests. He compared the benefits of land and sea trials, noting the difference between controlled testing versus operating conditions testing on each. Engineering test legs would avoid the problem of "selling" engineering testing to scientific leg co-chiefs.

Storms emphasized that increased engineering budgets are not as important as consistent funding for key projects. He said that consistent liaison with key JOIDES panels (LITH, SOHP, e.g) is a necessity as well as exchange with industry should continue. The five TAMU engineers are over-committed now, and in order to prepare for future developments, staffing must be kept at appropriate levels.

Storms presented TAMU's proposed long-term development engineering schedule (Appendix H). Although some of the legs listed are not finalized, Storms noted that TAMU would like to project staffing and funds for engineering tests. He said the length of the legs and time between them would hopefully dovetail with the science program.

Priority crustal coring tasks (Appendix J) and the status of crustal coring projects (Appendix K) were presented. Storms noted that the positive displacement coring motors were performing well on Leg 118 tests. TAMU is looking at the diamond coring high speed system as a key system for deep basement penetration and recovery in fractured rock. In reference to modifications to the hardrock orientation systems, Storms noted that they would be needed for Leg 123. TAMU hopes to test existing systems with the mining coring system, but no TAMU engineer is available for the project. Storms said that TAMU engineer Steve Howard will be assigned as permanent liaison to LITHP.

Storms next covered priority sediment coring tasks (Appendix L) and status of sediment coring projects (Appendix M). Continued development of the XCB coring system is a priority as ODP is running the tool deeper, into harder rock than the original design was intended. In discussion of the Navidrill, Storms noted that no engineer would be available for Leg 120, a critical leg for Navidrill use. He said that the disappointing tests on Leg 114 set the program back and that feedback on the performance of the redesigned tool on Leg 118 would be very important. TAMU is interested in a hydropercussive tool as a potential solution to interbedded and unconsolidated formations, but no engineer is assigned to follow its development.

Storms finished his presentation with discussion of downhole tools and liaison with outside tool developers (Appendix N).

Discussion:

Storms presented statistics on recovery of XCB cores during DSDP compared with ODP statistics; he said the performance on Leg 117 (68.0%) was not much improved over DSDP recovery, and said more comparison testing (double holes with the same rig crew on each test) would be needed. He said that the final XCB tool would probably not solve the alternating hard/soft lithologies problem such as chert/chalk.

N.Pisias said that PCOM will look at the TAMU development schedule and respond with PCOM priorities for upcoming legs. Storm acknowledged that the Navidrill was a known PCOM priority from last year's program plan, but the Navidrill addressed a complex problem. Langmuir suggested that certain CEPAC programs be postponed if the appropriate tools are not ready in time.

Francis asked why the Navidrill had been downplayed in the COSOD II document. Storms said that the COSOD draft dealt mainly with major new systems. Since industry does not use the Navidrill concept, TAMU has had to do all design, testing and modification work, with some assistance from Eastman Christensen. Storms said that incorporating measurement while drilling techniques and conducting land tests would have been optimal for the tool, but that engineers worked hard to ready the present Navidrill for Leg 118. Schlich added that Leg 119 would have been a better test leg, and the IOP had assumed that the tool would be ready for Leg 120.

M.Kastner emphasized the need for follow-up on engineering programs, especially when immediate program needs tie up tools that are essential for future legs. She said that TAMU must comment on the engineering feasibility of science plans so PCOM can redesign/reschedule those programs, one to two years in advance, which technically can not be achieved at that time.

Storms commented further on the Navidrill land tests. Originally, land tests were to be scheduled on interbedded formations between Leg 114 and 118, but TAMU did not have funds for two separate systems and engineers' time was limited. The tool would not have been ready for 118 if land tests had been conducted.

The engineering test leg was further discussed, including budget impact. Pisias commented on JOIDES input for geologic sites for the tests. He said the transit from Leg 124 solves logistical problems, and the young, fractured rock in the Mariana Trough is geologically appropriate. Garrison added that the tests sites would have to have surveys and routine safety approval.

Storms said the tools most likely to be tested on the first leg would be an early version of the mining coring system, Navidrill, pressurized core sampler, the Leg 121 version of the XCB, and possibly the positive displacement coring motors.

Jarrard added views on the many tasks versus limited manpower for PCOM priority projects. He said that setting priorities would be especially important in FY89 with a possible increase in funds, but that the rest of FY88 must be planned effectively to see that longer term projects can be accomplished.

PCOM Action Items on Engineering:

A list of PCOM action items resulting from the TAMU Engineering presentation was discussed the following day. M.Kastner presented her and J.Malpas' views on the necessary directions for ODP Engineering so that TAMU can be responsive to the science program. She said that PCOM must be willing to change scientific objectives if the engineering is not available. Malpas added that continued funding for ODP from the non-U.S. partners would be more secure if engineering planning in advance of specific programs could be demonstrated. PCOM discussed ways to insure that TAMU and PCOM exchange schedules and progress reports for engineering developments, with the following results:

PCOM Motion:

The Planning Committee will set up a monitoring group, consisting of one U.S. PCOM member and one non-U.S. PCOM member, to act as the first line of liaison among PCOM, the advisory panels, TAMU engineers and the Borehole Research Group. (Motion, Malpas, second Kastner)

Vote: for, 10; against, 5; abstain, 0

T.Francis and M.Langseth were appointed as the monitoring group, with the initial task of modifying the engineering development timetable presented by TAMU with PCOM's perceptions of when these developments will be needed.

PCOM Consensus:

When scheduling panel meeting locations, JOI and PCOM should consider the importance of scheduling one meeting per year at College Station to encourage exchange with the TAMU Engineering Group.

1 December 1987

692 WIRELINE LOGGING REPORT

R.Jarrard reported for the Borehole Research Group. LDGO, and provided a written summary (Appendix O).

Leg 117 results:

Jarrard, the logging scientist on Leg 117, gave logging results from sites on the Owen Margin and Ridge, and the Indus Fan (Appendix O). Jarrard described physical properties logs from Site 723, in particular a high uranium component which corresponds to high porosities and organic matter in the core. Logs from Site 722 on the Owen ridge picked up complex mineralogy changes and are being processed for Milankovitch cycles.

Discussion:

Jarrard discussed the accuracy of the U/Th/K logs, among the best calibrated geochemical tools. LDGO wants to test their quality through comparisons with XRF data. Jarrard updated PCOM on tests of log geochemistry accuracy. Tests of Leg 107 results are being conducted and Leg 117, with up to 100% core recovery will be useful in comparison studies. Although the geochemistry tools do not replace XRF analyses, Jarrard emphasized that the continuous geochemical capability of the log is valuable.

Operations report:

The bridge problems have improved since Leg 110 due to the revised mud program, with only one bridge in five holes reported from Leg 117.
Jarrard reported on the quality of through the pipe logs from Leg 117. A test of spectral gamma logs showed a consistent suppression of the signal by the pipe. Slower logging would improve the signal, but data from through pipe logging are useful except between 0 - 30 m depth. Jarrard said that additional tests on other geochemical logs are needed.

Status of logging tools:

Jarrard reviewed tools on upcoming legs (Appendix P with new tools indicated in upper case).

Jarrard asked PCOM to encourage development of a French sediment magnetometer, which developers say can determine reversal stratigraphy. This tool is not slim enough for ODP use at present.

LDGO has asked that three hours be set aside for testing of the RESOLUTION wireline heave compensator's effects on logging tools.

Jarrard reported that the consolidation of logging tools to two strings would not be completed for another year. To consolidate from three strings, a new phaser resistivity tool, a better lithodensity tool and calibration of the Cf-source neutron tool are needed. PCOM discussed the calculations of logging times with three strings. Jarrard said that the new mud program is reducing the need to run the side-entry sub; he suggested that three runs, without the side-entry sub, be standard in calculating logging times for ODP.

Formation Microscanner:

Jarrard said that both LDGO and DMP advocate the acquisition of a Schlumberger formation microscanner (FMS), which must be slimmed for ODP use. PCOM discussed the tradeoffs of this purchase with that of a third wireline packer, originally budgeted for FY88. DMP has pointed out that reliability tests on the packers will take at least a year, and DMP would like to assess the FMS during that year instead of purchasing a third packer.

Jarrard said that the tool would be useful on most legs as opposed to other "specialty" tools. He said that it could be incorporated on a third string with a high temperature tool. He reviewed the capabilities of the tool for facies and dip determination and for high resolution stress directions.

Jarrard noted that the FMS would be useful for upcoming programs in the Western Pacific such as Northeast Australian Margin, Japan Sea and S.China Sea Margin drilling, and especially for Nankai. B.Taylor added that for WPAC sites, especially margin sites, the tool would definitely be used if available. Jarrard said that Leg 124 would probably be the earliest the tool would be on-line. Processing time will be greater for this tool, Jarrard noted, but Schlumberger is providing the software in its purchase agreement.

The following day, PCOM passed the following motions and consensus items regarding ODP logging:

PCOM Consensus:

PCOM proposes that TAMU Engineering and the Borehole Research Group work together to plan a test for the JOIDES RESOLUTION wireline heave compensator by providing time estimates and a candidate ODP leg for such testing.

PCOM Consensus:

PCOM encourages continued development by the French of an ODP-compatible, 3-component sediment magnetometer.

PCOM Consensus:

Time estimates for standard Schlumberger logging on ODP legs will be based on three tool string runs without sidewall entry sub deployment.

PCOM Motion:

PCOM accepts the Borehole Research Group and Downhole Measurement Panel recommendation for purchase of the Schlumberger formation microscanner, modified as a slimline tool, for ODP use. (Motion Brass, second Francis)

Vote: for, 13; against, 0; abstain, 2

[Note: Acceptance of this recommendation postpones purchase of a third wireline packer. Total cost is $160K, divided between FY88 and FY89.]

693 PANEL CHAIRMEN'S MEETING REPORT

D.Cowan, Chairman of the Panel Chairmen's meeting held on 29 November, presented the report. Minutes of the meeting are attached as Appendix Q. The group focussed on panel structure, but also covered long-term planning, engineering developments, and Part B publications. Extensive discussion of COSOD II was deferred.

Cowan summarized the Chairmen's concerns on advisory panel structure discussed at their meeting:

* Concern that enough regional and thematic expertise exists on the panels in order to address global themes.
* Should major thematic panels be subdivided?
* What is the lifetime of a regional panel?
* How can the panel's handle the number of proposals in the system? Should deadlines for submission be established?

The Chairmen have recommended the following modifications to the panel advisory structure:

* The number and character of the present thematic panels should be retained.

* Thematic panels can form advisory bodies for specific tasks; they report to the panels.

* Regional panels synthesize thematic priorities, mature proposals and logistical constraints into drilling prospectuses.

* Regional panels have a finite lifetime.

* Thematic panels should reflect a global distribution of regional expertise.

During the Chairmen's meeting, the dual role of DMP as a service and science development panel was discussed. At the meeting, J.Peirce noted that with its interest in global stress mapping and other themes, DMP has become thematic, in additional to its role as a service panel. A motion was forwarded which recommended that DMP be viewed as a thematic panel, but did not pass. The consensus of the Chairmen was that although DMP serves largely as a service panel, it also considers and promotes the science of downhole measurement.

In conclusion, Cowan noted the Chairmen's concerns on plans for the drillship after the program in the Pacific has been completed. He said that the community must know plans soon. Cowan said that COSOD II, workshops, thematic panels, and advisory groups will play a role in these plans.

Discussion:

Langmuir added that LITHP needs direction for thematic long-term planning, not just a shiptrack. Mayer said that SOHP also needs direction on how to move from ocean to ocean planning. Cowan suggested that the thematic panels be given a specific charge as TECP still focuses on individual proposals. He added that working groups could play an important role and help reduce the workload on thematic panels.

R.Schlich expressed concern that solutions to panel structure point to an increase in the number of panels, and resultant problems in communication and expense. He advocated a regional system of expertise that would move with the evolution of the program.

B.Taylor alerted PCOM to the sense of incompatibility the panels chairmen see for a proposal-driven, thematic program. He said that themes such as deep sediment holes or reference sites will involve dedicated ship time, and "freezing in" programs may result.

694 ANNUAL REPORTS OF THE PANEL CHAIRMEN

Downhole Measurement Panel:

P.Worthington reported on activities of DMP during this year. Worthington reviewed meetings and membership of DMP, and presented the panel's philosophy on the ODP downhole program:

1) ODP holes are not objectives in themselves, they are a scientific legacy.
2) The acquisition of downhole measurement data should be planned from a global standpoint.
3) When a site is vacated, properly executed logs provided the only continuous record of the succession. Logs provided and intermediate sampling scale between core and surface geophysics; they characterize the subsurface environment and record physical properties in an in situ environment.

In order to increase liaison with TAMU, DMP is requesting to meet once each year in College Station. DMP liaison to TEDCOM is also requested, as well as with regional panels in critical planning stages.

In his review of tool improvements, Worthington stressed that if the budget does not allow purchase of a tool in one fiscal year, that tool is placed as the top priority in the next year's budget. DMP supports purchase of the formation microscanner as a high resolution dipmeter that will image faster and better than the BHTV plus improve the resolution of other logging tools.

DMP has evaluated the physical properties program and Worthington outlined development priorities (Appendix R). DMP asked that PCOM acknowledge that the panel's mandate includes review of the physical properties program and asked for a subgroup to monitor it. [PCOM nominated D.Karig, a physical properties specialist, to fill a panel vacancy.]

In conclusion, Worthington said that much scientific "meat" was cut from the DMP White Paper as it appeared in the COSOD II document; DMP is looking for outside publication of the paper.

Tectonics Panel:

D.Cowan presented TECP's agenda for 1988 and beyond. Directions of the panel include:

1) Scientific reviews of proposals; appropriate experts needed;
2) Survey of global tectonic problems (balance ocean against ocean); and
3) Implement plans from COSOD II and workshops.

Cowan said that the panel is concerned with how ODP can actively begin advertising a longer term program of global themes so that the appropriate proposals can be generated.

In regards to Western Pacific planning, Cowan said that TECP finds the Sunda proposal lacking, even with the prospect of additional site survey data. The panel is more positive toward the revised S.China Sea Margin proposal.

Lithosphere Panel:

C.Langmuir reported for the LITHP, whose Annual Report is attached (Appendix S). In his presentation, Langmuir reviewed the major LITHP drilling themes for CEPAC, an important region for LITHP objectives. (see CEPAC discussion). He emphasized that these themes would require bare rock, high temperature, fractured rock and deep penetration drilling.

Langmuir forwarded LITHP's recommendations for the WPAC program:

I. Half-leg drilled on Conical Seamount and adjacent forearc site as highest priority for second half of the Bonins-Marianas program.

II. Lau Basin: One leg without barerock drilling; LG-2 in western Lau with 200m basement penetration is the highest priority. Bare rock drilling should be for engineering development and should not compromise other science.

III.Geochemical reference holes:

LITHP reminds WPAC and PCOM of the diversity of objectives behind reference holes:

1. compositions of sediment and ocean crust being recirculated.
2. compare alteration/hydrothermal activity of old fast-spreading with old slow-spreading.
3. Old Pacific crust composition
4. Causes of velocity structure and magnetic signal of fast-spreading crust.
5. Correlations between crustal compositions and neighboring arc volcanics.

LITHP proposes one and one-half leg of reference hole drilling:

A: One 'deep" (200m basement) hole off the Bonins to complete the transect and recover normal reference section.
B. Three shallower holes (50m basement) near DSDP Leg 59/60 transect (seamount, seamount apron, non-seamount).

Langmuir forwarded LITHP's concerns on the WPAC program, especially on the site specificity and availability of site surveys. He said the Bonin site can be located on Lamont MCS lines; the specific location can be optimize to integrate with the M-series anomaly proposal (287/E) if desired. Langmiur said the normal Marianas sites MAR-4 would be near Site 452, the MAR-5 site at the seamount flank, and MAR-6 at the seamount summit. The Larson cruise is attempting to survey the MAR-5 and MAR-6 sites. LITHP has suggested that the Iwo-Jima anomaly may be a better site, for reasons of scale-length arguments and site survey availability.

Sediment and Ocean History Panel:

L.Mayer reported for SOHP whose Annual Report is attached (Appendix T). Mayer reviewed the panel's engineering priorities: short-range (support of TAMU liaison, magnetic orientation of cores), medium range (continuous core logging) and long-range (deep stable holes, drilling through salt).

Mayer reviewed SOHP's recommendations for the Western Pacific program, in order of priority:

Program	Sites
1.Northeast Australian Margin	NEA 1,2,3,4,5,8,9,10,11,13,14
2.Japan Sea	JS-2 (double HPC)
3.S.China Sea (Basin)	SCS-5 (with industry data)
4.Sulu Sea	Sulu 4, Sulu 5
5.South China Sea Margin	Not yet prioritized by SOHP
6.Bonins	Bonin 6

SOHP did not respond to requests by PCOM to examine Nankai transect sites for a possible hydrogeology program. Although it acknowledges the importance of fluid flow problems and tries to incorporate these objectives into legs and sites, SOHP does not have a proposal to review for Nankai hydrogeological studies, and therefore, did not consider it further.

Mayer presented a detailed report on SOHP's priorities for the Northeast Australian Margin drilling (a 22-page, site by site prospectus was distributed at this meeting). Mayer reviewed the objectives of the program:

1.To determine Oligocene through Quaternary history of sea level fluctuations, relate these to other "global" sea level signals, and test the validity of the Vail et. al. hypothesis. To contrast "margin" with "atoll" subsidence in the same region.
2.To evaluate facies and stratigraphic models for passive margin evolution.

3.To evaluate "margin hydrology"- the diagenetic history of pure carbonate and especially mixed carbonate/siliclastic sequences.
4.To define the effects of latitudinal plate motion and therefore paleoclimatic and oceanographic factors on carbonate platform development (particularly reef growth and cessation - the Darwin point concept).

SOHP's drilling plans call for two transects, one a latitudinal transect through various tectonic environments. The second transect is a NS one which will address tectonic, paleoceanographic and paleoclimate objectives.

Mayer reviewed SOHP's justification for drilling at the NEA Margin. In his review, Mayer emphasized that the margin slopes in the region are such that seismic events can be continually traced from shallow to deep water, and that the proximity of three platforms with independent tectonic and subsidence histories permits separation of local from "global" sea level signals (with buried reefs as subsidence markers). The separation of tectonic versus global sea level effects was a particular concern of PCOM at its August meeting.

Mayer added that SOHP had discussed the Mississippi Valley-type deposits proposal for the program. They did not recommend adding extra sites for this objective as it is not clear that there is a mechanism for driving the mineralizing fluids through the system. SOHP is interested in investigating pre-mineralizing conditions at the existing sites.

Mayer then reviewed SOHP's CEPAC priorities (see CEPAC discussion). SOHP has reviewed 33-CEPAC proposals and eliminated 17 as not theme-related. SOHP's top priority programs are similar to those of COSOD II Working Group I, although they were derived independently (see listing in the CEPAC discussion below)

In his discussions of the ODP planning process, Mayer asked that a hierarchical structure be established to ensure a thematically-driven program. He said that as SOHP's mandate is broad, PCOM may consider subgroups for the panel.

<u>Indian Ocean Panel:</u>

R.Schlich presented the report for IOP whose written report is attached (Appendix U). Schlich focused on changes requested by IOP to the upcoming Kerguelen programs:

1) <u>Leg 119, Site KHP-1</u>
   Option to terminate drilling at KHP-1 above the 910 mbsf reflector (discordance A) if drilling becomes too difficult or if sediments contain poorly preserved microfossils, and instead drill KHP-3 below the 320 mbsf reflector.

2) <u>Leg 120, Site SKP-2</u>
   At the request of the PPSP, site SKP-2 has been moved about 12 km NW, with drilling depth estimated at 1200 mbsf.

3) Leg 120, Site SKP-3
PPSP has limited drilling to 800 m which precludes the Mesozoic stratigraphy/tectonics objectives for the site. Two new localities, SKP-3B and SKP-3C, have been defined.

For Exmouth Plateau drilling, IOP has recommended that proposed site EP12 be added to the EP7 site for improved tectonic interpretations; they recommend a program consisting of EP7, EP10, EP12, and EP2A if an acceptable proposal for EP12 drilling is submitted and if PPSP approves the change. If not, the original program of EP7, EP10, EP2A and EP6 is recommended. (Sites are in priority order.)

Schlich asked PCOM for a meeting of IOP after the Indian Ocean program is completed in order to compare program objectives with actual achievements.

In his discussion of the ODP panel structure, Schlich noted that IOP agrees with a thematic orientation for ODP. Because the Indian Ocean has no major institutions nearby, care must be taken that major themes there are not passed up if the IOP is disbanded.

Western Pacific Panel:

B.Taylor reported for WPAC, whose written report is attached (Appendix V). Taylor reviewed the Western Pacific Program, noting the various options for sites and clearances in the Banda-Sulu-SCS program (see Western Pacific discussion). Taylor said that the SCS Margin proposal has preliminary approval from TECP. The Sunda program is now ranked lower by TECP, and WPAC recommends dropping it from the prospectus.

Central Pacific Panel:

S.Schlanger reported for CEPAC, whose written report is attached (Appendix W). Schlanger reviewed the current CEPAC prospectus, noting that transit time will be a large factor (up to 90 day) for the program. Schlanger gave an overview of selected programs of the 23 detailed in the prospectus and reviewed the technology requirements for CEPAC targets. He emphasized that certain targets (Ontong-Java Plateau, Marshall Islands, Shatsky Rise, e.g.) need engineering developments sooner (chert/chalk/limestone penetration) if they are going to be folded into the WPAC program.

Schlanger said that in order to produce an advanced prospectus, PCOM guidance was needed on: further definition on thematic panel input, length of CEPAC program, advice on thematic balance of the program and a "freeze" date for the program in light of engineering lead times.

Atlantic Regional Panel:

J.Austin reported for ARP whose written report is attached (Appendix X). He identified themes in ARP's priorities list as best addressed in the Atlantic. He suggested "open competition" for drilling among oceans as a way to get a global, thematically focused program.

Austin said that workshops in central Atlantic and Arctic drilling are planned. He asked for further definition of future meeting schedules for ARP, since scheduling meetings with workshops would be one way of keeping ARP thematically oriented in the "off-season."

2 December 1987

Southern Ocean Panel:

P.Barker reported for SOP whose written report is attached (Appendix Y). He reviewed the recent ODP successes in high-latitude drilling on Legs 113 and 114 and plans for 119/120; Barker suggested that SOP is a "semithematic" panel since high-latitude paleoceanography and continental glaciation are addressed in the Southern Oceans. He said that more drilling in the South Pacific would answer important objectives there and that proponents are discouraged because of a perception that ODP will not drill there. He noted that because of weather windows, a regional panel structure that deals with high-latitude drilling does not operate on a "campaign" like other regions.

Information Handling Panel:

In his report for IHP, T.Moore emphasized core curation, data storage and access, ODP publications and the micropaleontological reference centers. Moore described the effects of budget reductions in core curation and said that sample request response time would take up to 10 weeks in the future. The data storage and access objectives are to microfilm and archive ODP/DSDP data and transfer them to a searchable computer data base.

Moore reported that ODP/TAMU is acquiring IBM-compatible microcomputers for use by scientists, as well as software for translating various word processing programs, which will aid manuscript preparation.

Moore said that IHP is reviewing the role of the ODP editorial board, and that a model for the review process had been proposed by ODP (see Appendix Z for a simplified model of the process). Moore asked for comments from the JOIDES community on the model. A copy of R.Merrill's 12 November 1987 letter describing the process was distributed at this meeting.

Two other IHP issues which required PCOM action were the continued updating of the micropaleontological reference collections and the problem of "non-production" by ODP cruise participants and sample requestors. [See further PCOM discussion and actions on these issues below.]

Discussion:

At its last meeting, PCOM reviewed a request from Canada for the eighth micropaleo reference collection. Moore said that IHP had researched the request and that technically the split has been promised to the Smithsonian Institute, although it has no funds to support it and PCOM may decide that another location is more suitable.

In conclusion, G.Brass thanked Moore and IHP for its thorough assistance in formulating the FY88 Publications budget and responding to other PCOM questions.

Technology and Engineering Development Committee:

J.Jarry reported for TEDCOM whose written annual report is attached (Appendix AA). Jarry reported that the Panel Chairmen's engineering priorities have not changed from last year (See attached minutes of PANCHM meeting.) He reviewed the long and short term engineering priorities for the program. Jarry noted that deep drilling, a longer term priority, must have dedicated development work if it is achievable for the Central and Eastern Pacific program. Shorter term engineering priorities, not ranked, are: pore pressure sampler, RCB/XCB/APC improvements, pressure core barrel, physical properties measurements, and core orientation.

TEDCOM encourages land testing of the Navidrill and other tools and supports dedicated engineering legs. TEDCOM wants better liaison between TAMU engineers and panels, TEDCOM liaison with DMP and better liaison with industry and outside engineers such as those at IFREMER. Jarry presented an update on the NADIA wireline re-entry system under development in France and currently scheduled for testing in July, 1988.

Jarry concluded his report with a discussion of the riser drilling workshop held at TAMU; TEDCOM has concluded that a slimline riser system, using mining technology, would be the most cost-effective way to achieve this capability for ODP. Jarry illustrated the limited ODP resources versus the divergent technology needs with his "ODP tree" (Appendix BB).

Site Survey Panel:

J.Peirce, outgoing Chairman of SSP, presented the report for his panel whose written report is attached (Appendix CC). Peirce updated PCOM on the site survey status on upcoming cruises and noted a big improvement in getting reviews earlier. He predicted no major problems with the WPAC program. He noted the importance of Carl Brenner at the Site Survey Data Bank in helping SSP with these reviews.

Peirce concluded his report with comments on NSF and other funding agencies' roles in planning site surveys. He said that in order to get beyond DSDP-style drilling, the shiptrack must be planned ahead to avoid last minute "replacement" programs. He said that the effort NSF has made toward planning surveys has made a real impact and suggested that unless a similar approach is made for engineering, the program could not advance.

Pollution Prevention and Safety Panel:

M.Ball reported for PPSP and a written report is attached (Appendix DD). Ball reviewed current membership and the functions of the panel, including its interaction with the TAMU safety group headed by L.Garrison. Ball reported that there is currently no formal procedure through PPSP for following up sites where hydrocarbons were detected, although TAMU does, if time permits.

N.Pisias thanked the Panel Chairmen for their reports and contributions to the meeting.

PCOM Consensus:

The Planning Committee recognizes outgoing Panel Chairmen, D.Cowan (TECP), S.Schlanger (CEPAC) and J.Peirce (SSP) for their dedicated service to ODP during their tenures.

695 COSOD II RECOMMENDATIONS

N.Pisias reminded PCOM that input on implementing COSOD II recommendations for long-range planning must be reviewed in detail at the next PCOM meeting. Changes in panel structure will have an impact on this planning. Some PCOM members had received advance copies of the COSOD II document shortly before this meeting, but most had only reviewed the recommendations chapter which was distributed at the meeting.

Pisias asked that PCOM watchdogs for each of the five COSOD II working groups be assigned to write position papers. These papers will include input from COSOD II, remaining COSOD I goals and thematic panel white papers. Watchdogs for the programs appear below:

COSOD II WORKING GROUP(s)	PCOM WATCHDOGS
I.Global Environmental Changes, & V.Evolution and Extinction of Oceanic Biota	N.Pisias W.Coulbourn S.Gartner
II.Mantle-Crust Interactions	J.Malpas (Canada) R.Larson
III.Fluid Circulation and Global Geochemical Budget	M.Kastner A.Taira
IV.Stress and Deformation of the Lithosphere	O.Eldholm M.Langseth

696 INDIAN OCEAN PLANNING

Leg 119 (N.Kerguelen/Prydz Bay):

PCOM reviewed co-chief J.Barron and IOP's requested changes to the leg. (See the

Indian Ocean Panel annual report.)

PCOM Consensus:

For Leg 119, PCOM accepts that proposed site KHP-3 will be drilled if site KHP-1 does not fulfill the scientific objectives of the leg.

Leg 120 (S.Kerguelen):

PCOM Consensus:

For Leg 120, PCOM recognizes the Indian Ocean Panel recommendation to relocate site SKP-3 on an existing line to satisfy safety concerns and address primary objectives.

PCOM Consensus:

PCOM accepts plans to test the French magnetic susceptibility tool during Leg 120 provided that the test does not interfere with scientific objectives of the leg.

[Note: Time estimate for the test is .3 days from the total 43 operational days for the leg.]

M.Storms presented various options for testing of the Navi-drill on this leg. He also discussed trade-offs with other programs such as redesign of the XCB. An ODP engineer will be required to operate the Navidrill and provision made for a re-entry cones as well. PCOM also discussed options of testing the tool on Leg 121 instead as more contingency time is available, and the chert/chalk sequences expected on the leg is a better test environment.

PCOM Consensus:

The Navidrill core barrel will be tested on Leg 120 only if the Leg 118 test is successful, if TAMU engineer Frederic Young is available for the test, and if Leg 120 co-chiefs have achieved their primary scientific objectives for the leg. PCOM encourages that contingency time set aside for the leg be used for this test.

Leg 121: (Broken Ridge/90ºE Ridge):

PCOM reviewed the recommendations of IOP to relocate Site BR-1 about 5 km downslope for a more complete section and approved the relocation. Garrison said that with the proposed changes to the Leg 121 program, about 2.2 days contingency time was available. TAMU would like to use the time to test the prototype mining coring system on the leg since a TAMU engineer will be onboard for Navidrill testing.

PCOM discussed the trade-offs of the lowest priority site (90ER-5) with the engineering test. Peirce, a co-chief for the leg, pointed out that the petrological objectives at NNER-5 rank lower than those at the other Ninetyeast Ridge sites because the site surveys demonstrated that dredging is possible at this location. Furthermore, the site is relatively closer to Site 254 than the other proposed sites are to holes drilled on DSDP legs.

PCOM Motion:

For Leg 121, drilling at southern site 90ER5 is of lower priority than an engineering test of the prototype mining coring system at the central site 90ER2. (Motion Brass, second Kastner)

Vote: for, 13; opposed, 0; abstain, 2

R.Jarrard added that DMP has requested downhole televiewer experiments (.3 day required) for site NNER-1. Peirce said that the stress regime in the central sites differs from the northern site and that DMP may want to reconsider those sites for the stress experiment.

PCOM Consensus:

For Leg 121, setting aside time for the proposed borehole televiewer stress measurements is deferred until the Downhole Measurement Panel has reviewed stress information from sites NNER9 and NNER10.

Additional requests for the leg, double HPC/APC on the Neogene section and deeper basement penetration on the central ridge site, were left to co-chiefs' discretion.

Leg 122 (Exmouth Plateau):

SOHP and IOP have considered a preliminary proposal for moving site EP-2A to EP-12 (see IOP report above). EP-12 covers the objectives of EP-2A and addresses additional tectonic objectives. Safety at EP12 may be a problem. von Rad added that drilling times may be underestimated for the leg and that for logistics, EP-10 would be best drilled first. PCOM discussed the thematic trade-offs of EP-6 (sea level effects) versus EP-12 (transitional crust) and EP2-A (synrift).

PCOM Consensus:

For Leg 122 drilling priorities (in order), Sites EP-7, EP10A, EP12 and EP2A are recommended, provided that EP12 can be drilled safely and if proponents show that it fulfills tectonic objectives. If EP-12 drilling is not advisable, the drilling priority is EP-7, EP-10A, EP2A and EP6.

Leg 123:(Argo-Abyssal Plain):

Further changes by PCOM to this leg await review of additional site survey data. Co-chiefs for the leg will be F.Gradstein (C) and J.Ludden (C).

697 WESTERN PACIFIC PLANNING

The attached 1987 WPAC Executive Summary shows the current status of the WPAC prospectus, included estimated drilling times (Appendix V). Legs 124 through 130 are included in FY89 planning.

Leg 124 (Banda-Sulu-South China Sea):

After their August meeting, PCOM had instructed WPAC to revise this leg in order to better address basement objectives. PCOM had determined that a Celebes Sea site might be added to the program. In response, WPAC ranked sites SCS-5, SCS-9, SULU-5, CS-1 and BANDA 1 and 2 equally as they all addressed unique problems. This six-hole program was estimated at 65 operational days, without transit, and therefore, represents more than a leg of drilling. In addition, the Banda sites face potential survey and clearance problems. Pisias suggested that PCOM plan a leg of drilling to address as many objectives as possible.

PCOM discussed the various transit and drilling options depending on clearance. B.Taylor said that the Celebes site will increase tectonic objectives, and as the two Banda sites are in distinct basins, both are optimal. He said that a DARWIN cruise in early March of 1988 would possible yield survey data for the Banda sites. SCS-9 is probably lowest priority for WPAC. SCS-5 may have to be moved as it lies in disputed waters.

L.Garrison said that TAMU would pursue clearances for all sites, especially those in Indonesian and Philippine waters, in order to have back-up programs. Taylor reminded PCOM that choosing co-chiefs for the program would be impacted since WPAC's recommendations represented scientists with expertise in specific basins, but that optimal science would be more important. He suggested that PCOM consider a 3/4 leg , three-site program until the April PCOM meeting, and in the meantime, go for all six site clearances.

PCOM Consensus:

The following options are in effect for the Leg 124 program, depending on clearance status:

Option 1:

A leg consisting of BANDA 1 and 2, and SCS-5 (alternate site, if necessary), as described in the WPAC prospectus, with 41.5 operational days allotted.

Option 2:

If no clearances from Indonesia for Banda are obtained, a program consisting of CS-1, SULU-5, and possibly SCS-5 (alternate) is proposed, for a total of 41.5 operational days.

Options based on no clearances and in context to the rest of the Western Pacific programs were discussed. L.Garrison discussed the logistics difficulties for a "normal" length leg as holidays will make shipping and travel extremely tight.

The following day, PCOM discussed additional options. As the South China Sea Margin program has gained favor with excellent new site survey data, this program was suggested as a possibility for Leg 124. Taylor mentioned possible clearance delays from the Chinese. Drilling times of 30 days may be underestimated as well.

Garrison suggested an additional option: moving the engineering leg to the first WPAC leg since transit and weather windows for later WPAC programs would improve. Garrison said that TAMU would try for all clearances, and by April, PCOM could decide on an option. He said that by June, 1988, site clearance must be obtained.

Pisias summarized that all six clearances would be pursued concurrently, as well as Chinese clearance for the South China Sea Margin sites because of long lead time necessary from the Chinese. If clearances are available from Indonesia for the Banda Program, then Option 1 of the previous consensus is the priority program.

Co-chief recommendations for the leg are listed in Appendix EE.

Leg 125E (Engineering Leg)

See discussion on inclusion of this leg. M.Storms listed the main systems to be tested on Leg 125E: Mining (MCS) coring system, a modified pressure core barrel sampler, Navidrill core barrel, and coring motors. Storms said TAMU would also like to continue tests begun on Leg 117 to confirm bending stress on the drillpipe in deeper water.

Transit and drilling times and possible drilling environments for the leg were discussed. B.Taylor said that WPAC considered the Marianas as a test site for the MCS and Navidrill. The Marianas are a U.S. trust territory. Also DSDP Leg 60 sites could be revisited with the new technology.

Storms said that TAMU would ideally like to drill in 100-200 m of sediments over basement in order to test the PCB/XCB/Navidrill in different lithologies, as well as test the MCS and Navidrill in crystalline rock.

Brass commented that in the future, PCOM should see a more definite proposal for engineering legs before considering them for dedicated ship time. T.Francis noted that the scientific community must help the engineers define the program.

PCOM Consensus:

PCOM supports the idea of a technology development leg, to follow the Leg 124 (Banda) program, and consisting of 30 days ship time. TAMU engineers should submit a proposal for the leg at the April, 1988 PCOM meeting.

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Leg 126 (Bonins/Marianas):

For this program, LITHP and TECP were asked after the August PCOM meeting to prioritize the science for the last half leg, for a total of two legs for the Bonin I and II programs. Both panels have recommended two holes in the Conical Seamount (MAR-3 on the flank and another at the top of the seamount). The BON-7 site originally in the program was ranked as a lower thematic priority by TECP.

WPAC has recommended a program consisting of MAR-3, MAR-3A, BON-6, and if time permits, BON-7. A second hole in the Marianas would permit studies of the unroofing history, and via inverted stratigraphy, the petrology of the intruded forearc. To save time, less than 700 m could be drilled at MAR-3, perhaps allowing BON-7 drilling in order to complete the Bonin and Marianas transacts.

U.von Rad mentioned that an upcoming SONNE cruise in June-July, 1988, would provide piston cores from the seamount area. Taylor said that digital SCS was recently obtained, and about 100-200 m of sediment are expected on the seamount.

PCOM Consensus:

The Leg 126 program will consist of drilling sites MAR-3 (the flank of the Conical Seamount), a new MAR-3A site (on the top of the seamount), BON-6 and BON-7. As recommended by the thematic panels, BON-7 is the lowest priority site.

Since this leg starts from Guam, PCOM recognizes that the Marianas sites will be drilled first followed by BON-6. Co-chief recommendations for the leg are listed in Appendix EE.

Leg 127 (Bonins):

In the current schedule, BON-1, BON-2, BON-5 and BON-5A constitute a full leg of drilling. The leg has two 950 m penetrations (BON-5A and 5B); PCOM discussed possible re-entry on the sites. L.Garrison indicated that a 56 days are required for the leg, including setting re-entry cones and contingency.

Taylor said that new site surveys had better defined drilling times for the leg. DMP has recommended more than standard logging for the leg. DMP was charged with formulating an updated schedule of downhole experiments and logging for WPAC to review, and the plans will be discussed at the April PCOM meeting. Taylor said that WPAC estimates a 56-day leg for the program.

PCOM Consensus:

PCOM recommends that the program outlined in the WPAC Third Prospectus (consisting of sites BON-1, BON-2, BON-5 and BON-5A), and estimated at 56 days operations time, be drilled for Leg 127. An updated downhole measurements program, to be provided by DMP, will be reviewed at the April, 1988 PCOM meeting.

Leg 128 (Nankai Trough):

No fundamental changes from the NKT-1 and NKT-2 program approved at the August PCOM were made. Total time estimated for the leg stands at 57 days. SOHP was asked to review the program for possible inclusion of fluid circulation/geochemistry sites for the program; SOHP feels that proposal 233/E (Oregon Margin) would better address this theme.

PCOM Consensus:

The Nankai Trough program will consist of drilling sites NKT-1 and NKT-2, as outlined in the Third WPAC prospectus, for a total leg time of 57 days.

Leg 129 and 130 (Japan Sea I and II):

The WPAC Prospectus outlined sites J1B, J1D, J1E and J3A for Leg 129, and no changes were made by PCOM. The inclusion of the engineering leg has slightly improved the weather window for this leg, now scheduled to begin in mid-July, 1989.

WPAC has endorsed a proposal to place a long-term seismic monitoring experiment at J1B, instead of the oblique seismic experiment proposed by DMP. A.Taira said that there were problems with funding the instruments for the experiment, however. Jarrard added that DMP has asked for 6.5 days for logging, VSP, and hydrofracture experiments, a plan too ambitious for the time available. He said the FMS, which will be available for the first WPAC leg, could replace the planned BHTV with shorter runs. PCOM members discussed the possibility of setting re-entry cones and finishing the logging program during Leg 130 (Japan Sea II). Garrison said that his logging program times include 10.7 days for Japan Sea I and 4.6 days for Japan Sea II.

PCOM Consensus:
The Japan Sea I program, with 54 days operation at sites J1B, J1D, J1E and J3A as outlined in the WPAC Third Prospectus, is scheduled as Leg 129.

PCOM Consensus:
PCOM endorses the program of 30 days drilling at Sites J-2A and JS-2, as outlined by WPAC, and recommends adding approximately 11 days for a downhole experiments (oblique seismic and deploying the Japanese seismometer, if available.) WPAC and DMP are to provide further definition for the downhole measurements program.

PCOM continued with plans for FY90 in the Western Pacific. As many of these programs involve development of tools outside of ODP, B.Taylor had asked that PCOM review this issue.

Nankai Geotechnical/Third Party Tools:

G.Brass suggested that a PCOM subcommittee meet with NSF, TAMU, LDGO and international partners with tools in development in order to draft a policy. He mentioned that PCOM had not seen a proposal for the GEOPROPS probe on which planning for the Nankai Geotechnical is dependent. B.Malfait said that six months of NSF funding (through April, 1988) for a conceptual design for the tool had been approved.

Langseth said the DMP is the best liaison mechanism for tracking these tools. Francis added that scheduling test time for these tools on preceding legs would impose development deadlines.

Taylor reviewed WPAC scheduling for the Nankai leg, which is dependent on Navidrill/RCB technology as well. He said an option would be to use the technology on a western CEPAC leg or for the Oregon accretionary prism. He said that WPAC prefers seeing the tool tested on the first Nankai program for feasibility, which would leave a year between use on the Nankai geotechnical leg.

Storms added that the probe needs a pilot hole and that the Navidrill may not be the ultimate system used. He advocated TAMU coordination with outside tool developers and assurance that the tool not only fits ODP equipment, but that it is a workable tool as well. Currently, TAMU has no role in monitoring these requirements.

Jarrard pointed out that DMP had not originally advised a separate Nankai geotechnical leg, and much development work in the year between Nankai programs would be necessary. Taylor reviewed TECP's prioritization of Nankai; it was chosen over other accretionary prism legs because a 2 km penetration to below decollement was not required for fluid studies.

PCOM Consensus:

> PCOM charges the Downhole Measurements Panel with providing detailed information on the proposed GEOPROPS probe tool for the Nankai Geotechnical leg. This will include: schedule for development, input to TAMU on hole requirements, and proposal revisions. PCOM expects a successful test of the tool before a leg dependent on it will be scheduled.
>
> Further, PCOM charges DMP to consider a generic solution to liaison of third-party tool developers with TAMU engineers, who have final approval on a tool's use on ODP legs.

M.Langseth volunteered to draft a letter to DMP on this matter.

TECP has informed the PCOM Office that a proposal which further defines the fluid measurements on the leg is forthcoming.

G.Brass asked that the next PCOM agenda include an item on outside tools. He said that TAMU must formally accept these tools before they are scheduled to make sure that they are compatible with TAMU/LDGO equipment. He also raised the issue of whether proven tools should be absorbed into the ODP budget.

Geochemical Reference Sites:

At the last PCOM, LITHP was charged with defining a minimum program for the reference hole concept. They recommend four holes for one-and-one half leg of drilling: a deep hole at BON-8 and three shallower holes near the Marianas transect of DSDP Legs 59 and 60. If only one leg were available, BON-8 and one shallow hole near the transect are recommended.

THe Chairman asked PCOM to consider this program as well as the broader issue of reference holes. G.Brass was enthusiastic about reference holes as a global cycling problem which is endorsed by all three thematic panels. He recommended that the thematic panels work on a proposal on recycling in subduction zones.

M.Kastner agreed that the theme was important as a long-term project, one which COSOD II strongly endorsed. She said that the original Natland/Langmuir proposal has changed, but that this arc environment test of the concept could be evaluated by the thematic panels for future programs. She advised setting up a Working Group on the subject. Kastner recommended BON-8 (originally planned at 500 m penetration, now down to 200 m) and MAR-6 as a minimum program.

Taylor reviewed plans to include the remaining one-half leg program (to complete the transect) with the high-priority CEPAC program for Old (M25) Pacific crust drilling. Langmuir has suggested MAR-5 as the top priority site for the first leg.

PCOM noted the massive cherts expected in the Mariana drilling (BHA lost on Site 452).

PCOM Consensus:

PCOM asks LITHP to devise a one-leg (or possibly one and one-half leg), geochemical reference site program, which will include BON-8.

South China Sea Margin:

WPAC has recommended this program pending TECP endorsement. Eldholm (TECP liaison) said the panel's interest in the program is growing; Pisias added that TECP likes the new survey data, but has not seen the revised proposal.

L.Mayer said that SOHP had not reviewed the new proposal, but would like the opportunity to compare this area with the drilling on the Northeast Australian Margin. J.C.Sibuet wondered whether the proposed drilling would allow testing of subsidence curve and margin evolution models. B.Taylor said that because of the mid-Oligocene break-up, a high resolution curve would be possible, as will as drilling to syn-rift sediments or basement. Conjugate margin drilling on the Reed Bank is doubtful due to substantial reef formations. Austin added that the Atlantic conjugates are older, with evaporites, and this location seemed more promising.

PCOM Consensus:

PCOM tentatively schedules a South China Sea Margin program, pending review of the proposal by TECP.

Sunda:

Taylor said that both TECP and WPAC have no strong interest in the current proposal or objectives. TECP favors drilling in the region behind Timor. Only one site, possibly to be included in the second half of the Banda program, are recommended based on current survey data. Francis said a February, 1988, DARWIN cruise is planned in the area. Pisias noted the potential clearance problems.

PCOM Consensus:

The Sunda program, in the form in the current WPAC prospectus, is removed from the Western Pacific drilling plans.

Northeast Australia Margin:

At the previous PCOM meeting, PCOM asked SOHP to provide a prospectus for the drilling at the NEA Margin; a well-documented prospectus was presented by L.Mayer in his Chairman's report. Deepening of one hole should get stratigraphic overlap to address the question of subsidence versus sea level changes, although safety may be a problem for such drilling.

PCOM discussed how to retain important objectives in a single leg since the current prospectus includes 12 sites. L.Mayer responded that the Darwin point concept (reef growth and recession) testing is of lower priority. If the program were to be cut, he recommended combining site 9 and 10A objectives in single site and dropping Site 13. Taylor added that the new site survey is extremely detailed and will help define the program.

PCOM Consensus:

In light of the new geophysical data, PCOM recommends a one-leg program on the Northeast Australia Margin. SOHP priorities for the leg should be coordinated with WPAC logistics for the leg. A one-leg program should be available to PCOM for review at the April meeting.

Vanuatu:

PCOM had requested that WPAC reduce the original one-and-one half leg program to a single leg which specifically addressed collision processes.

PCOM Consensus:

PCOM approves a one-leg, collision process program for Vanuatu, consisting of sites DEZ 1, 2, 3, 4, and 5 and IAB 1A and 2A, for the second half of Western Pacific drilling.

Lau Basin:

PCOM had previously requested that LITHP formulate two scenarios for a single leg of drilling: one with and one without bare rock drilling, which would focus on back arc processes.

LITHP favors a no-guidebase program consisting of sites LG-2, either LG-1 or LG-7, LG-3 on the platform, and LG-6 to drill forearc volcanics (as a back up site). With bare rock drilling, LITHP proposes a site on or near axis between 18-19o S, plus drilling of LG-2. A Scripps SCS survey will be available next year for specific site locations.

PCOM Consensus:

The Lau Basin science program, which requires no bare-rock guide base, is accepted for a single leg of drilling in the second half of the Western Pacific Program. The drilling plan will include a forearc site. Further definition of the program will be made when new site survey data are available.

Engineering discussion:

PCOM discussed the status of bare rock drilling and guide base development. Several PCOM members recommended that TAMU defer development on a cheaper, smaller guidebase, in order to concentrate on more pressing program needs. Storms said that with the new mining technology drilling, a smaller, more portable guidebase may be used. The option of including guidebase drilling could be available for all legs in the future, if guidebase development proceeds with the mining coring system work.

Pisias asked that TAMU engineers provide an outline on guide-base development at the next PCOM meeting. Garrison said that experience from Leg 118 deployment would give valuable input.

PCOM discussed TAMU's proposal for additional engineering legs in the Western Pacific, specifically in reference to drilling at the Lau sites as a prelude to EPR drilling in the CEPAC program. Storms said that TAMU engineering must set up a schedule for testing in fractured rock, including land testing, in order to drill in the Lau Basin. Pisias asked the engineering sub-group to take this into consideration for their schedule.

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Pisias opened the meeting. L.Garrison followed with an update from Leg 118. After TD at 500 m, a total of 434 m of gabbro had been drilled with 87% average recovery. The mudmotors on the HRGB had worked well and the Navidrill was being tested. The Navidrill had recovered rock on the initial test, and the logging program, including VSP, was in progress.

698 CENTRAL PACIFIC PLANNING

O.Eldholm opened discussion on the CEPAC program, noting that the Western Pacific program had expanded from one and one half years to two years. Pisias responded that 18 months for planning purposes had been set aside previously, but the WPAC programs had all been accepted in terms of science.

Pisias read the motion from the April, 1987, PCOM meeting which stated: " For clarification of the Pacific planning, the Planning Committee reaffirms its advice to CEPAC, WPAC and the thematic panels that WPAC plan an approximately 22-month drilling plan based on their top nine programs and that CEPAC utilize an 18-month guideline for CEPAC planning. CEPAC shall include scenarios with and without a three-leg East Pacific Rise program."

Taylor said that the only new addition to the 9-program, 11-leg plans for WPAC was the geochemical reference hole, a concept with strong thematic interest. Eldholm believed that PCOM should prioritize the WPAC program; he said there is some concern that the ship will stay in the Pacific indefinitely.

Kastner wondered how CEPAC could plan time in the Central Pacific, especially considering the time allotted to the East Pacific Rise program. She believed that if important objectives warranted it, PCOM must face the fact that four or five years could be spent in the Pacific. Austin added that in order to see global themes, all oceans must "compete" for drilling time.

Eldholm agreed that science must run the program, but there is concern in the community, especially in renewal of the MOUs, about the time spent for Pacific drilling.

Pisias pointed out this issue will be reviewed by the Panel Structure Subcommittee, as long-range plans will impact the type of panel structure adopted in the future.

Francis suggested an arbitrary block of time be set aside for CEPAC to provide an planning framework and to satisfy national interests. Eldholm said that the ESF Consortium had discussed this issue. The Consortium does not see a conflict between "shuttling" between the Pacific and Atlantic, even if it means increased transit times. He suggested that some kind of balance be achieved.

W.Coulbourn said that CEPAC will continue to come forward with excellent science plans for their region, and PCOM must provide some guidance soon. G.Brass said that PCOM should plan science, and let EXCOM decide if a political question exists on the shiptrack. Francis did not see it merely as a political question; he believed the Atlantic region was not getting its share of drilling.

Pisias noted the concerns and said that in order to frame a four-year plan, the impact of CEPAC's program should be examined. Pyle noted that the transition using COSOD II objectives will impact the plan as well. Malfait said the final plan must be available by April, 1988, and EXCOM can not discuss scientific balance until its May meeting.

Thematic objectives in CEPAC planning:

The Chairman reviewed the status of the current CEPAC prospectus, in which the six top-ranked priorities of the thematic panels were presented.

Kastner opposed setting aside an arbitrary six months for each of the panels. She said PCOM must look at the dominant themes. She presented a summary of the themes suggested by more than one panel and other panel priorities:

CEPAC Themes Summary (M.Kastner)

1) Old Pacific Crust (LITH, TECP, SOHP)
2) Ontong-Java Plateau (LITH, SOHP)
3) Guyots and drowned atolls (TECP,SOHP)

LITH	SOHP	TECP
EPR	Eq.Pac.Paleocean.	Chile triple junc.
Juan de Fuca	Shatsky Rise	Flexure in lith.
Loihi		
504B		

Pisias pointed out that the Old Pacific crust was a low-ranking program for two thematic panels. He said that reference site drilling could also be added as a three-panel theme. He asked for a review of the list by the thematic panel liaisons and had PCOM review the list below which was compiled for the meeting agenda book:

SOHP:

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. Metallogenesis & Diagenesis:		233/E	Oregon accret. margin
7. Fans and sedimentary processes		250/E	Navy Fan

The 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.

LITHP:

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 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 of Oceanic Plateaus:	222/E	OJP
6. Drilling Old Oceanic Crust...:	285/E	Magnetic Quiet
	Zone	
	(261/E	Nauru Basin)

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

TECP:

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	Or.accr.complex
		237/E	Active margin off Vancouver Isl.

Pisias noted that the TECP objectives had not been prioritized in the above list. He asked PCOM to note common themes and construct a schedule. Langseth wanted input from the thematic panels on which themes were best addressed in the Pacific. Pisias said that even if the panels identify those programs, the list must be reduced. M.Kastner said that availability of technology would impact the choices for the program.

J.Malpas, as a member of LITHP, felt that the panels had already provided strong cases for their priorities, including technology considerations. A.Taira agreed that PCOM should now give guidance to the panels. Malpas suggested setting a definite time for drilling. He mentioned that the Japanese had waited a long time for the ship, and if necessary, the second year of CEPAC drilling could include Atlantic Ocean "pogoing". Langmuir added that all six LITHP themes were best and almost exclusively for drilling in the Pacific.

L.Mayer said that SOHP programs listed were prioritized and "Pacific specific." He said that proposals for CEPAC drilling are continuing to flow to SOHP, and the thematic panels should be given time constraints. Mayer said that SOHP may want to reexamine the program in light of a total thematic program and may decide on several legs on a theme rather than an arbitrary number of top ranked programs.

G.Brass strongly opposed giving each thematic panel an arbitrary equal number of legs for CEPAC. He noted that LITHP had been "saving up" of the Pacific. Tucholke was concerned that by dealing with isolated programs, the thematic panels would not have an opportunity to "cross-fertilize" and evaluating multiple objectives for legs.

Austin gave an update of the Atlantic planning. He said that the thematic panels had not been asking his panel for input and few proposals are in review.

Following this discussion, a motion was forwarded to reaffirm the time frame for CEPAC drilling.

PCOM Motion:

PCOM should draw up a plan for approximately 18 months of drilling in the central and eastern Pacific and send it back to the thematic panels for justification, with the understanding that the program could be expanded if important themes emerge. (Motion: Malpas, second Brass)

Vote: for, 13; against, 2; abstain, 0

Discussion:

PCOM then approached the question of how to select themes (and associated proposals) for CEPAC drilling to fit into a 18-month timeframe.

PCOM agreed that lithosphere objectives should be well-represented in the plan since LITHP has "saved up" for drilling in the Eastern Pacific. Furthermore, tectonic objectives had been dominant in the Western Pacific area.

PCOM decided that approximately four legs should be devoted to LITHP objectives, three legs to SOHP objectives and two legs to TECP objectives.

Tentative CEPAC Program:

PCOM defined a tentative CEPAC program using the highest priority themes of the three thematic panels. PCOM watchdogs were assigned to these themes for a more detailed discussion at the April, 1988 PCOM meeting. PCOM agreed that watchdog assignments would be made on themes, and would not be limited to specific proposals, although relevant ones for watchdog review were identified.

Tentative Central and Eastern Pacific Program

Program	Relevant Proposals	PCOM Watchdog(s)
LITHP		
* Structure of lower oceanic crust (about 1.5 leg)	286/E Deepening of 504B [300/B Return to 735B]	J.Malpas or Canadian rep.
* Magmatic and hydro-thermal processes/ sed-free ridgecrests (2 legs)	76/E East Pacific Rise at 13^{o}N 14/E EPR 13^{o}N	T.Francis
* Magmatic and hydro-thermal processes/ sedimented ridgecrest (1 leg)	232/E Juan de Fuca 224/E and 284/E Escanaba Trough	M.Langseth M.Kastner

SOHP

* Neogene paleo-environment (1 leg)	221/E Eq.Pacific 142/E OJP transect	S.Gartner
* Mesozoic paleoceanography/ atolls and guyots (1+ leg)	202/E Drowned Marshalls Guyots (203/E Cent.Pac Guyots) (260/E Ogasawara Plateau)	B.Tucholke
* Anoxic events (1 leg)	253/E Shatsky Rise	G.Brass

TECP

* Ridge-trench processes (1 leg)	8/E Chile 3-junction	O.Eldholm
* Flexure in the lithosphere (1 leg)	3/E Hawaii flexural moat 291/E Marquasas	Coulbourn

ALL PANELS

* M-series dating/ reference holes	285/E Jr quiet zone 287/E M-series drilling 261/E Nauru Basin 267/F Geochemical Ref. Hole	A.Taira J.P.Cadet

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Discussion:

PCOM tried to address LITHP's highest priority programs with the above program. Several PCOM members noted that LITHP had fewer programs than TECP in the Western Pacific, and felt that 8 of the tentative 18 months for CEPAC drilling should focus on their thematic priorities. Tucholke asked that LITHP's response to the above program include discussion on essential technology.

In devising the SOHP program for CEPAC, Brass suggested that two themes, Mesozoic paleoceanography and sea level changes at atolls and guyots, are combined in Proposal 202/E (Drowned Marshall Guyots). Overlaps with TECP on Old Pacific crust drilling were noted.

The impact of three possible legs on the EPR and how to distribute them among the CEPAC program were discussed. M.Storms said that the close timing of bare-rock legs 106 and 109 did not leave adequate engineering development time between them.

Because the TECP had not priority-ranked its six top programs, PCOM agreed that additional input was necessary. PCOM is concerned with experimental design for drilling of ridge-trench collision. Eldholm (TECP liaison) indicated that accretionary prisms are TECP's lowest priory of the list. Taylor added that the Nankai program addressed this for TECP. M-series dating and ridge trench interaction were seen as particularly specific to Central Pacific drilling by PCOM. PCOM agreed that TECP be asked to devise a two-leg program in the Central Pacific.

Reference holes were further discussed. Pisias said that all three panels would be asked to look at the concept for the Central Pacific, particularly in combination with the Old Pacific Crust and M-series dating objectives. Pisias added that the three thematic panels must meet before the next CEPAC meeting in order for CEPAC to refine the prospectus.

Langmuir discussed LITHP's request for a special session for EPR drilling. He said a working group would like to meet before LITHP's March 1988 meeting and would include members outside of LITHP. He said a good synthesis proposal is needed for this high-priority program. Langmuir said that the RIDGE program is currently working on this idea, but will not produce an ODP proposal. Austin expressed concern that both groups were not working together.

PCOM Motion:

> PCOM approves formation of an East Pacific Rise Working Group as requested by the Lithosphere Panel. (Motion, Tucholke; second, Malpas)

Discussion:

Tucholke prefaced his motion by noting that ODP is in transition to a more thematically driven program. Working groups would ensure that comprehensive proposals for themes could be produced and he encouraged formation of one for the EPR.

Austin expressed some concern that by forming working groups, panels would become lobbyists for specific programs. He urged that the larger scientific community know that the program is moving in the direction of themes, not oceans, to prevent this. Tucholke responded that former Atlantic working groups on the Caribbean and Mediterranean had acted as advocates and followed PCOM instructions appropriately. Malpas suggested that engineering input would be important for such a group.

Vote: for, 11; against, 3; abstain, 1

Pisias formulated instructions for the working group from the above discussion. LITHP will be asked to provide PCOM with a list of names for the EPR working group, and members will be chosen after consultation between the PCOM and LITHP Chairmen. The working group will be asked to meet before the next LITHP meeting, in College Station, and report results through LITHP.

Central Pacific Logistics Planning:

T.Francis noted that with its outline for CEPAC drilling, a 9-leg program had been devised opposed to a 12-leg program for the Western Pacific. He asked that PCOM consider which of the Central Pacific legs could be inserted into the WPAC drilling schedule.

Pisias bought up the broader question of whether PCOM should mandate a finite time for the drillship to return to the Atlantic (1992?). He said that inserting CEPAC legs into the Western Pacific program for logistics reasons differed from putting them in because of a three-year limit in the area.

PCOM Motion:

For purposes of planning the Pacific program. PCOM should retain the option of replacing a couple of WPAC legs with CEPAC legs in the second year of Pacific drilling. (Motion, Francis; second, Gartner)

Francis explained that his motion would keep options open for Pacific planning and would not detract from the CEPAC program. Several PCOM members expressed concern that the motion did not make clear whether CEPAC programs would replace WPAC programs only for reasons of logistics.

Vote: for, 3; against, 11; abstain, 1

699 MEDIUM RANGE PLANNING

Pisias referred PCOM to the information in the agenda book regarding a medium range science plan. The plan will be used for budget and engineering requirement projections for the next four years of programming. It will be used as a basis for a U.S.National Science Board review. Pisias said that the JOIDES Office would construct the document using the two years of WPAC planning firmed up at this meeting plus the CEPAC program as outlined by PCOM. A draft of the plan must be sent to JOI, Inc. for budget input by late December.

700 PANEL REVIEW SUBCOMMITTEE REPORT

T.Francis reported that the subcommittee had met twice during the course of the meeting. The committee members were Francis, Taira, Langseth and Heath (EXCOM). [Note: M.Leinen, the second PCOM member, was absent]. N.Pisias was present at the first meeting of the subcommittee.

Francis noted that the group had a tremendous amount of input, often containing divergent advice. In discussing a new panel structure, the subcommittee considered the problem of proper balance for all member countries.

A written report from the subcommittee will be submitted by R.Heath. Francis gave some preliminary results of the discussions, including the following:

* The number of panel meetings should not increase in the future.
* As it is important that ODP be thematically driven, a number of models for

restructuring of the thematic panel structure were discussed. An increase in the number of these panels may be necessary, with a possibility of splitting SOHP into two panels - paleoceanography/bioenvironment and diagenesis/sedimentary processes panels.

* Regional panels should be phased out and somehow incorporated into ad hoc planning groups appointed by PCOM. These groups would construct drilling schedules.
* Thematic panels would oversee thematic subgroups.
* A new technical service panel, an on-board data analysis panel, is suggested. This panel would assist SOHP on geochemistry matters and also deal with physical properties.

701 PCOM FY89 BUDGET RECOMMENDATIONS

Budget 4% Set Aside:

Pisias asked PCOM to make recommendations to forward to JOI, Inc on the FY89 budget, specifically the allocation of the 4% set aside for special operations. Brass said that the science plans did not call for special operations and suggested the funds be applied to engineering development, as well as equipment purchase, such as drillstring replacement, as previously discussed by PCOM. He also suggested that these funds be used in part to support development of downhole geotechnical tools. A.Taira added that geotechnical tool development involves not just the tools themselves, but development work by TAMU to be able to produce clean holes for them.

Pisias asked PCOM to identify any specific items, excluding staffing, needed for long-term developments, adding that BCOM will have to make final recommendations because of Program Plan deadlines.

PCOM Consensus:

One half of the 4% set aside for special operations in the FY89 ODP budget should be applied to program engineering needs. PCOM recommended that some of this be set aside for interface with downhole measurements developments. TAMU should provide input on their development priorities, which will be forwarded to BCOM. It is understood by PCOM and recognized by TAMU that these funds will not be applied for staffing at TAMU.

702 INFORMATION HANDLING PANEL ISSUES

Micropaleontological reference collections:

As requested by the Information Handling Panel, PCOM discussed support for the DSDP/ODP micropaleo reference collections, currently housed at seven international centers. M.Kastner summarized the issues: bringing current collections up to date, preparing the radiolarian collections, and maintaining them in the future. W.Coulbourn added that the centers were formed in response from the scientific community and he supported their continuance.

T.Moore reviewed the status of the radiolarian collection, which has not been funded by DSDP or Lamont in past requests. He said that IHP does not recommend that the centers themselves be supported, but that sample preparation for the radiolarian collections be considered. Gartner said that if PCOM is willing to recommend support for the collections, it should also monitor progress on the project for continued support.

Moore reviewed usage of the centers and said that the European centers have been used by many researchers. Taira said that the new Japanese center has been well-received. He suggested that a small workshop for the directors of the centers be funded, in conjunction with IHP, in order to develop a long-range plan for the collections.

The Chairman suggested that the item be postponed for the FY89 Program Plan. He asked IHP to coordinate a proposal for bringing the radiolaria collections up to date and on ways to continue the centers' work. In terms of long range budgeting, it was suggested that $200K start-up costs be would required, with $100K maintenance per year thereafter.

ODP "Non-production":

T.Moore had discussed the issue of non-performance at the Panel Chairmen's meeting. Non-performance extends to co-chief editorial obligations, sample request follow-up, manuscript preparation for the Part B Proceedings volumes, among other concerns. Moore suggested that these non-participants be notified through JOIDES that a perception exists that certain obligations have not been fulfilled. The individual could respond and clear any misconceptions or explain mitigating circumstances. Moore stressed that these letters would not be sent lightly and the ultimate purpose would be to improve the science program.

Pisias added that TAMU should be aware of non-producers, especially co-chiefs and potential co-chiefs, so it can effectively staff cruises. Coulbourn noted that co-chief obligations are clearly stated, but often a co-chief is timely with his own contributions to a volume, and does not participate on the volume as a whole. T.Moore asked PCOM if it would consider sending copies of the notification letters to the individuals funding institution. L.Garrison said that TAMU would be better able to respond on why certain co-chiefs candidates were not selected if this mechanism existed.

Pisias asked that IHP draft a sample letter to be sent to ODP non-producers, names of whom IHP will compile. After review, the letters would be sent from the JOIDES Office.

703 WIRELINE RE-ENTRY BY THIRD PARTIES

At the October, 1987 EXCOM meeting, EXCOM endorsed a request by the French for wireline re-entry of Site 396A, contingent on PCOM scientific approval. PCOM determined that the request presented no problem, but agreed that TAMU should be informed of the condition of the hole after the experiment.

A verbal U.S. request to enter Site 417 next summer will be considered when a proposal is available. Pisias noted that a BHA was left in the hole and may be fishable. Francis suggested that these requests be considered on an ad hoc basis in the future.

704 JOIDES OFFICE ROTATION

The non-U.S members of PCOM, and W.Coulbourn, Hawaii Institute of Geophysics PCOM member, met during the meeting in order to recommend a replacement for Michael Wiedicke, the current JOIDES non-U.S. liaison, for the October, 1988 rotation of the JOIDES Office to HIG.

The French candidate, Laurent D'Ozouville, now with CCOP-SOPAC, was recommended. If he can not take the post, the Canadian candidate, Elaine Leblanc Isabelle from the Canadian Natural Sciences and Engineering Research Council, is recommended.

705 PANEL MEMBERSHIP

PCOM made the following recommendations for JOIDES panel replacements, based on panel and PCOM suggestions:

Panel Chairmen:

TECP: D.Cowan rotating off to become U.Wash. PCOM member.
PCOM endorsed TECP's recommendation of Ian Dalziel (UT-Austin), who currently serves on TECP.

SSP: J.Peirce retiring, after SSP's next meeting. PCOM recommends the following:

1.Greg Mountain (LDGO)
2.Alain Mauffret (France, currently on SSP)

PCOM based its recommendation on the need for excellent communications between the SSP Chairman and the ODP Site Survey Data Bank, housed at LDGO.

CEPAC: S.Schlanger has asked to step down from the Chairmanship. PCOM recommends:

1.Dave Rea (U.Michigan, Ann Arbor, currently on CEPAC)
2.Connie Sancetta (LDGO, on CEPAC)

PCOM recommended Rea because CEPAC is currently in the planning phase for the Central Pacific drilling and, since Rea has been a past CEPAC Chairman, can quickly assume the duties of chairmanship.

Panel Membership:

ARP: ARP has requested that a petrologist replace rotating member, K.Klitgord. PCOM recommended:

1.J.Karson (Duke)
2.H.Dick (WHOI)

CEPAC: Rotating off: D.Scholl. PCOM recommendations are:

1.L.Kroenke (HIG)
2.W.Sager (TAMU)

SOP: SOP has asked that a replacement for three members, D.Elliot, J.Kennett, and P.Ciesielski, be postponed until the April, 1988 PCOM meeting when the role of this regional panel may be better defined. SOP's next meeting will be scheduled in mid-88.

WPAC: At-large member rotating off: J.Recy
WPAC recommends D.Tiffen (CCOP-SOPAC) and PCOM has endorsed the recommendation, if funding for Tiffen's travel can be arranged. [Note: The JOIDES Office has been notified that Tiffen will end his post with CCOP-SOPAC and WPAC withdrew his name from consideration.]

Rotating off: J.Ingle. PCOM recommends the following:

1. R.Thunnell (U. South Carolina)
2. J. Hein (USGS)

LITH: Members rotating are: J.Hawkins, C.Langmuir, and J.Sinton. LITHP requests two petrologists and one geophysicist. PCOM recommended the following:

Petrologists:

1. M.Perfit (U.Florida) or W.Bryan (WHOI) will be invited.
2. J.Alt (Washington Univ. in St.Louis) If Alt cannot serve, S.Humphries (SEA at Woods Hole) will be invited.

Geophysicist:

1. John Orcutt (Scripps). If Orcutt cannot serve, N.Sleep (Stanford) will be invited.

TECP: Members rotating off are: D.Cowan, D.Howell, B.Marsh and P.Vogt. TECP and PCOM recommend the following:

Plate kinematics, history of ocean basins:

1.D.Engebretson (W.Washington)
2.D.Gallo (URI)

Mechanical models:

1.R.Buck (Columbia)

PCOM decided to retain D.Howell and P.Vogt on the panel for the next TECP meeting to avoid rotating such a large portion of the membership.

DMP: PCOM confirmed that DMP membership is 15 members. D.Karig (Cornell) was recommended for membership in order to increase physical properties expertise on the panel.

IOP: Membership changes were deferred to the April, 1988 PCOM meeting.

BCOM: G.Brass will continue to serve on the Budget Committee along with N.Pisias from PCOM.

706 FUTURE MEETING SCHEDULE

N.Pisias asked that an extra day be set aside for the spring 1988 PCOM meeting, now scheduled for:

19-22 April 1988	College Station, TX

T.Francis provided information on the next international meeting (Appendix FF), scheduled for:

23-25 August 1988	Oxford, England

G.Brass agreed to host the next annual meeting of PCOM, and the following dates were tentatively set aside:

28 November - 2 December 1988	Miami, Florida

707 ODP SEDIMENT CLASSIFICATION

A copy of the revised ODP sediment classification scheme, which incorporated SOHP's responses, was distributed at this meeting. U. von Rad forwarded his disapproval that the scheme continued to use the term "neritic" instead of "shallow water carbonates".

PCOM Consensus:

The ODP Sediment Classification Scheme, as revised by TAMU, is acceptable to

PCOM and endorsed for use by ODP.

708 DMP RECOMMENDATIONS

Pisias said that DMP should forward its responses to the WPAC downhole program to WPAC and PCOM. PCOM will also ask TAMU to respond to the recommendations from the Physical Properties Working Group as there will be financial implications for the program.

709 SOHP RECOMMENDATIONS

SOHP had asked that the TAMU policies on core be examined, including issues of retaining whole round core and core barrel magnetization. Gartner said that fixed sampling intervals did not allow for best represented or recovered sections at times.

Garrison said that TAMU could be less rigid with its whole core retention policies if necessary. He asked and PCOM agreed that SOHP formulate specific concerns and then forward them to IHP. PCOM will review the recommendations at its next meeting.

At the conclusion of the meeting, N.Pisias thanked all participants for their contributions and for coming to Oregon. There being no further business, the meeting was adjourned at 1:45 PM.

APPENDIXES TO SUNRIVER PCOM MINUTES*

A List of handouts at November 30 - December 4, 1987 meeting
B EXCOM Report from 5-7 October 1987 meeting
C Strawman Timetable for Evaluation and Incorporation of COSOD II Recommendations
D NSF Funded ODP Grants List
E Other NSF Items of Interest
G ODP Operations Schedule
H Proposed "Long Term" Development Engineering Schedule prepared by TAMU
I ODP Leg Participation Tally, Legs 101-120
J Priority Crustal Coring Tasks (TAMU/ODP)
K Crustal Coring Projects List (TAMU/ODP)
L Priority Sediment Coring Tasks (TAMU/ODP)
M Sediment Coring Projects List (TAMU/ODP)
N Downhole Tools Development and/or Principal Investigator Liaison (TAMU/ODP)
O Wireline Logging Services Report
P Leg 117 Logging - Summary of Findings
P List of logging tools scheduled for Legs 118 through 121
Q Minutes of JOIDES Panel Chairmen Annual Meeting , 29 November 1987, Sunriver, Oregon (pp. 11)
R Physical Properties Items (from DMP Annual Report)
S JOIDES LITHP Annual Chairman's Report
T SOHP Annual Report
U Indian Ocean Panel Annual Report
V 1987 WPAC Executive Summary
W CEPAC Annual Report to PCOM
X ARP Summary of Activities 1987
Y Southern Ocean Panel Annual Report 1987
Z Flow chart of Vol.B Manuscript Review (from IHP Annual Report to PCOM)
AA TEDCOM Annual Report
BB ODP Tree (presented by J.Jarry at meeting)
CC Annual Report of the Site Survey Panel
DD Annual Report of PPSP to PCOM
EE List of PCOM Co-Chief recommendations through Leg 127
FF Info sheet, PCOM meeting scheduled in U.K., 23-25 August, 1988 (from T.Francis)

* Not included with agenda packet; attached to draft PCOM minutes mailed out for PCOM review in December, 1987.

LEG 124 - ENGINEERING LEG

PRELIMINARY SYSTEMS/EQPT TEST PLAN

* Deepwater test of entire drilling and coring equipment in 26,000-27,000 feet water depth, plus test of ship's positioning system and beacons at maximum design depth. Possibly deploy standard reentry cone and perform sonar or TV reentry.

* Diamond coring system test - utilize diamond/mining drilling system inside ODP drill string to drill/core out ahead of the main bit. A 200-300 meter basement penetration is what is targeted for that system.

* XCB/NCB testing further to Legs 121 and 122. Systems will be hopefully run/tested in interbedded formations. Multiple hole comparison testing is desireable.

* Run/deploy TAMU rotatable drilling packer in a coring BHA, set packer and resume drilling.

* Perform additional drill string bending tests in deepwater for data points for engineering drill pipe rubber needs.

* Evaluation of Kevlar sandline.

* Evaluation of further hybrid core bits in hard rock formations.

* Three to four days of logging equipment tests performed by LDGO.

BWH
3/24/88

COSOD-II
Working Group I
Nick Pisias, Watcher of the Dogs

Philosophical Framework: There are three fundamental concepts expressed in the report of the working group entitled Global Environmental Change. The first is that the science of paleoceanography and paleoclimatology needs to move beyond the stage of conceptual models. Our ability to model climate system (in terms of atmospheric and oceanographic circulations models) has developed to a level where it is now possible to begin to merge the observational data base collected by ocean drilling into these numerical descriptions of the earths environmental system. The difficulty with the conceptual models used in paleoceanography is that it is essentially impossible to assess all the implications of inferences drawn from observational data. A simple example may be useful. Recent analysis of late Pleistocene sea-level and deep ocean stable isotopic variations have been interpreted to indicated more than 1°C cooling of deep Pacific bottom water temperatures during the last glaciation. Implications of this inference can be assessed with a simple heat budget model of the ocean which requires a doubling of oceanic deep circulation rates to achieve the predicted cooling. This increased oceanic circulation during glaciation is in contradiction with available carbon-14 data. Thus, the combination of data and models places important constraints on the nature of oceanographic circulation changes during glacial time which could not be determined from the data alone.

The second concept is that the presence of a known forcing function on the climate system, variations in the distribution of solar radiation caused by variations in the earth's orbit, provides a unique opportunity to investigate the processes in the ocean climate system responsible for global environmental change. This situation is unique in the geophysical sciences.

The last important concept is that understanding the evolution of the global environment on geologic time scales requires a determination of global sea-level.

Drilling Strategy: By the nature of paleoceanographic studies the drilling strategy of Working Group I is global in nature. Of high priority is a global array of "transects" which would provide information on both vertical water mass characteristics as well as the nature of surface oceanographic processes on a "global" basis. The resolution of studies needed to examine variability on time scales of orbital forcing requires continuous core recovery. These transects can be used to address the first two concepts mentioned above.

A second high priority set of drilling objectives addresses the problem of determining eustatic sea level by drilling on atolls/guyots and on passive margins.

In addition to the drilling transect to address the major objectives of Working Group I, exploration drilling was recognized as being of importance. One region of critical importance to the global climate system is the Arctic Ocean. At present very little is known of the evolution of this ocean basin. The second area of exploration is old ocean sediments.

COSOD-II
Working Group V
Nick Pisias, Watcher of the Dogs

I basically agree with the assessment of SOHP with respect to Working Group V. What I extract out of the working group report is that there are many processes which could cause biological evolution. It seems that the first order problem is to define a sampling stratigy to test the relative importance of each of these processes. The required drilling strategy would be a high resolution global array of sites (which is compatible with the array outlined by Working Group I). A resolution array is necessary to provide accurate stratigraphic control to examine the timing and distribution of species radiations etc.

GLOBAL ENVIRONMENTAL CHANGE

Summary Outline

88-128
RECEIVED MAR 28 1988

Only two distinct targets/objectives are identified in this section, **Paleoclimate** and **Sealevel**, with the heading **Exploratory Drilling** added as an afterthought. The bulk of the report is devoted to the first of these three objectives.

Paleoclimatic Change:

Two first-order goals are identified as follows:

i. To learn how global climate has changed.

ii. To understand the causes and mechanisms for the changes.

These goals are discussed/framed under the the following topical headings:

1. Understanding the Forcing Function - In terms of
   a. Energy Input: Milankovitch Forcing
   b. Ocean Basin Geometry
2. Understanding Response (and feedback?) Mechanisms (and how to monitor them) in terms of
   a. Sediment Flux
   b. Atmospheric CO_2 Variations
   c. The $CaCO_3$ System (carbonate sedimentation)
   d. Chemical Tracers of Ocean Circulation (^{13}C, Cd, etc.)
3. Improving Geochronology
   a. Bio- and Magnetostratigraphy
   b. Chemostratigraphy: Strontium (crude!)
   c. Chemostratigraphy: Isotope Events (e.g., major isotope events) ?!
   d. Cyclostratigraphy from Logs
   e. Quantitative Stratigraphy (interpolation, extrapolation, filtering)
4. Terrestrial Climate Changes from
   a. Clay Minerals
   b. Terrestrial Organics (pollen, biomarkers)
   c. Eolian Sediments
   d. Tectonics (not orography)
5. Evidence for Major Changes
   a. Physical Change (continent-ocean basin rearrangement, seaways, land bridges, etc.
   b. Chemical Changes (atmospheric O_2, CO_2)
   c. The Observational Challange (how to overcome the age/depth of burial/preservation/abundance of drillable sections bias)

6. Modeling
   a. Atmospheric Circulation
   b. Ocean Circulation and Chemistry
   c. Ice Sheets (possible different states with very different temperature regimes)
   d. Land Elevations (sediment balance)

Sea Level Change:

The first-order goal is to document quantitatively amplitude and timing of major global sea level oscillations. The problem is to be attacked three ways: 1. The atoll approach (a dipstick in the middle of the ocean); 2. the passive margin approach (a platform subsiding at a determinable rate); 3. the isotope approach (sea level inferred from isotopically determined ice volume). All three approaches are deemed necessary because not any one of them can yield unequivocal results (e.g., poor temporal resolution [1], overriding local subsidence rates [2], incomplete understanding of relationship between ice volume, temperature and oxygen isotope ratios [3].)

Exploratory Drilling:

Three initatives are discussed in this category; the Arctic Ocean, Continental Margins, and Older Sediments. The second two of these are assigned priority two.

Drilling Strategy & Requirements:

The strategy outlined for the above represents a fairly large agenda for drilling. The Paleoclimate program (priority one) is estimated to require from 572 to about 700 days on site. Atoll drilling (priority one), which is the first part of the Sealevel Program, would ideally take about 216 days, of which 96 days would require a drillship and the remaining 120 days an alternative platforms. Passive Margin Transects, the second part of that program, would require another 245 days on site.

COSOD-II WG4 STRESS AND DEFORMATION OF THE LITHOSPHERE ("one-page" summary report by Olav Eldholm).

The recommendations focus on three main inter-related topics: 1) The present state of stress in the oceanic lithosphere. 2) The use of crustal drill holes as permanent seismic observatories. 3) Processes determining the tectonic and deformational evolution at margins of oceanic plates.

Stress. Stating that in situ stress provides a tool for analyzing the dynamics (driving and deformational forces) of the lithospheric plates, a program of global stress measurements (1000 km apart) as well as local studies of special tectonic provinces (trench, transform, spreading centers) is proposed. The objective is to be achieved by: 1) Drilling the "standard holes" at least 100 m into basement to determine physical properties and breakouts. 2) Dedicated plate transects comprising detailed in situ stress measurements. 3) Intergrated stress, physical property and seismic measurements in selected very deep holes.

Seismic observatories. Presently, seismic imaging studies have demonstrated important lateral and vertical inhomogeniety in the mantle. These anomalies relate in some way to the driving mechanism for plate tectonics. However, the mapping of the mantle suffers from a lack of oceanic seismic records. The technology now exists to instrument seismic observatories in deep basin boreholes, although logistical problems in terms of data recovery and maintenance are recognized. Optimally, it is proposed to establish 25 observatories with 11 sites as a minimum to obtain the necessary resolution.

Margins of oceanic plates.
The scientific reasoning is based on the fact that the COSOD-I goals are only partly full-filled, and that much new information in terms of data and models are now available. It is also recognized that these regions are composed of segments that differ in depositional and structural style and evolutionary history. Thus, the drilling approach requires transects in well mapped and "typical" localities.

The various types of passive margins (non-volcanic, volcanic, transform) are treated in the context and environment of rifting. The sediments and underlying basement rocks provide the main input to an understanding of the structural and thermal margin evolution. Although complete transects require very deep holes, many aspects of the margin history can be addressed at selected margins with the present technology. In particular, transects crossing the conjugate pairs of margins are considered a basic premise for passive margin drilling. Regardless, the need for initially 3-4 km, and later 4-6 km, deep penetration is realized.

The Mid-Oceanic ridge system is also a plate margin and is briefly discussed in the report. Because there is much overlap with WG2, I refer to this report for a more comprehensive treatment.

Despite the increase in knowledge of the active margins we still lack understanding of what causes their structural variations and how the causative processes operate. A unifying problem is the processes responsible for the wide range of deformational responses to plate convergence. It is proposed to concentrate drilling near the toe of the forearc rather than towards less acessible targets at the interior of the margin. At the forarc, drilling should encompass: 1) Sites to define and constrain geometries and kinematics of the rocks. 2) In situ measurements of key physical, chemical and geological parameters. This includes also measurements in the decollement zone between the forearc and the underlying plate.

SUMMARY: COSOD WORKING GROUP 5 -- PROGRAM EPOC
EVOLUTIONARY PROCESSES IN OCEANIC COMMUNITIES

Submitted to Joides Office by William T. Coulbourn 3/8/88

The aspirations and needs of EPOC (Evolutionary Processes in Oceanic Communities) program are outlined in a 15 page document contributed by Working Group 5 to the COSOD report. That chapter contains 74 rhetorical questions, a full-page abstract, 10 pages outlining the scientific rationale for the EPOC objectives and two pages of recommended strategies and techniques.

1. Evolutionary and Global Ocean Drilling Array: Objective 1 seeks to establish (1) the patterns and modes of speciation and diversification and (2) the geography of these processes. The endeavor requires a detailed temporal sampling of a geographically widespread network of drill sites. The result should be an improved understanding of paleoenvironmental, geochemical and paleomagnetic processes.

2. End Cretaceous Extinctions and Early Cenozoic Recovery: Objective 2 seeks to elucidate aspects of (1) the evolutionary pattern of organisms that might permit the prediction of their success or failure during a mass extinction, (2) the rate of extinction at this era boundary, (3) the taxonomic, ecologic, and biogeographic selectivity of extinction, (4) the evolutionary pattern that determines the composition of the biota during the post-extinction recovery, and finally (5) the similarites of the K/T mass extinctions to other extinction events.

3. Origins and Early Radiations of Modern Microfossil Groups: Objective 3 addresses the (1) the skeletal production of the principle groups of planktonic micro-flora and -fauna, (2) the correlation of the variability of that skeletal production with diversification and extinction events, (3) the coupling of the plankton evolutionary patterns with those of the microbenthos, (4) the relation of those patterns to the paleogeography, -fertility, -climate, and -circulation of the oceans, and finally (5) the feedback between evolutionary radiations and global chemical environment.

The rationale for the EPOC program involves discussion of evolutionary models, radiation events, extinction events, environmental effects and related biological phenomena.

Implementation of the EPOC program for the late Cenozoic requires a global array of 100 continuously recovered sections directed at recovery of planktonic microfossil groups (first priority), and another 100 sites for the benthic groups (second priority). The K/T boundary objectives would be met with an additional 30, globally distributed sites on Cretaceous and Jurassic crust.

The report concludes with recommendations for improvement of the magnetometer, support of the DSDP-ODP microfossil reference collections, a development of a 10 cm diameter HPC corer, and improved drilling capability in sections of alternating hard and soft sediment.

COSOD I recommendations and their coverage by COSOD II

COSOD I	COSOD II
1. Processes of magma generation and crustal construction at mid-ocean ridges. What is the character and composition of the deep portion of the oceanic crust?	WG2-topic 3: Creation of crust.. topic 1: Complete crustal sections
2. Configuration, chemistry, and dynamics of hydrothermal systems. What are the dimensions and characteristics of hydrothermal systems at ridge crests versus those on ridge flanks? How does overlying sediment cover, or the lack of it, affect these hydrothermal systems?	WG3-topic 2: Mid-ocean ridge axis topic 3: Mid-ocean ridge flanks
3. Early rifting history of passive continental margins. What is the shallow and deep structure of stretched and normal faulted margins versus those characterized by excessive volcanism?	WG4-topic 2: Passive contin. margins (WG1-topic 4: Passive margin transects) (WG1-topic 6: Explor.drilling at margins)
4. Dynamics of forearc evolution. What are the relative motion, deformation, and pore water characteristics of sediments at accreting and erosional margins?	WG3-topic 1: Active margins WG4-topic 3: Convergent margins (WG2-topic 4: Interact.at converg.margins)
5. Structure and volcanic history of island arcs. What are the space and time relationships of forearc subduction, accretion, and erosion; and of backarc spreading, compression, and volcanism at island arcs?	WG2-topic 4: Interact.at converg.margins (WG3-topic 1: Active margins) (WG4-topic 3: Convergent margins)
6. Response of marine sedimentation to fluctuations in sea level. Which stratigraphic sequences and intervening unconformities represent fluctuations of sea level, and which represent vertical tectonic motion? What is the response of deep-sea sedimentation to fluctuations of sea level?	WG1-topic 1: Global Neogene HPC array -topic 2: Global Paleogene HPC array -topic 3: Atoll transects -topic 4: Passive margin transects ...
7. Sedimentation in oxygen-deficient oceans. What are the ocean circulation, paleoclimate, and potential hydrocarbon characteristics associated with black shale deposits?	(WG1-topics 1,2,4,7, see above) (WG5-topic 2: Cretaceous & Jurassic seq.)
8. Global mass balancing of sediments. What are the best estimates of the world sediment mass and composition balances in space and time?	?
9. History of ocean circulation. How do patterns of ocean circulation respond to changing ocean boundaries, e.g., changing ocean size, the extent of shallow continental seas and the opening and closing of oceanic passages, especially the Drake passage, the Isthmus of Panama, and the Tethys seaway? What is the history of abyssal circulation?	WG1-topic 1: Global Neogene HPC array -topic 2: Global Paleogene HPC array -topic 3: Atoll transects -topic 4: Passive margin transects
10. Response of the atmosphere and oceans to variations of the planetary orbits. How do gravitational interactions with other planets, especially Jupiter, affect paleocirculation in the atmosphere and hydrosphere?	WG1-topic 1: Global Neogene HPC array -topic 2: Global Paleogene HPC array -topic 3: Atoll transects -topic 4: Passive margin transects
11. Patterns of evolution of microorganisms. How has the process of evolutionary change proceeded in marine organisms?	WG5-topic 1: Cenozoic HPC array (plankton) -topic 2: Cretaceous & Jurassic seq. -topic 3: Cenozoic HPC array (benthos)
12. History of the earth's magnetic field. What is the nature of the magnetic field during a magnetic reversal? What is the detailed history of magnetic reversals and changes in the intensity of the magnetic field during the past 200 m.y.?	WG1-topic 1: Global Neogene HPC array -topic 2: Global Paleogene HPC array -topic 3: Atoll transects -topic 4: Passive margin transects ...

C O S O D - I

OBJECTIVES

OBJECTIVES	Bahamas LEG 101	W.N. Atlant 102	Galicia Bank 103	Norweg Sea 104	Labrad Sea 105	Mid-Atl Ridge I 106	Med Sea 107	NW Africa 108	Mid-Atl Ridge II 109	Barbados North 110	504B 111
1. Processes of magma generation and crustal construction at mid-ocean ridges.			deep older crust			HRGB			HRGB		deep crustal pen
2. Configuration, chemistry and dynamics of hydrothermal systems.						Atlant Ridge			Atlant Ridge		off-axis flow
3. Early rifting history of passive margins.			starved margin	volc passive margin							
4. Dynamics of forearc evolution.										accret prism	
5. Structure & volcanic history of island arcs.											
6. Response of marine sedimentation to fluctuations in sea level.		carb platfrm									
7. Sedimentation in oxygen-deficient oceans.							sappro-pels				
8. Global mass balancing of sediments.											
9. History of ocean circulation.				Nor Sea circ.	Lab Sea			Eq.Atl.			
10. Response of atmosphere and oceans to variations in planetary orbits.					Logging results		Med response	Eq.Atl.			
11. Patterns of evolution of microorgansims				Hi-lat biota	Hi-lat biota						
12. History of the earth's magnetic field.											

COSOD I

COSOD - I

OBJECTIVES

Objectives	Peru Margin LEG 112	Weddell Sea 113	So. Atlantic 114	Masc. Plateau 115	Intra-plate Def. 116	Neogene 117	SWIR 118	Kerg/Prydz By 119	Central Kerg 120	Broken/N90E Ridges 121	Exmouth Plateau 122
1. Processes of magma generation and crustal construction at mid-ocean ridges.							Deep crustal sampling				
2. Configuration, chemistry and dynamics of hydrothermal systems.											
3. Early rifting history of passive margins.		Passive Margin									Multiple Rifting
4. Dynamics of forearc evolution.	Tectonic Erosion										
5. Structure & volcanic history of island arcs.											
6. Response of marine sedimentation to fluctuations in sea level.	Peru Margin										Passive Margin
7. Sedimentation in oxygen-deficient oceans.	Anoxic Sed					Oxygen Min					
8. Global mass balancing of sediments.											
9. History of ocean circulation.	Peru Current	Antarct Glacial	Paleo-gateways	Neogene deep Ind		Monsoon	Antarct glacial	Antarct Paleogene			
10. Response of atmosphere and oceans to variations in planetary orbits.	Peru Current			Indian carb system		Monsoon	circum-polar circula-tion			S,hemi-sphere Wester-lies	
11. Patterns of evolution of microorgansims		Hi-lat biota						Hi-lat biota	Hi-lat biota		
12. History of the earth's magnetic field.				Hotspot plate kine-matics	Mid-plate tectonic					Hotspot plate kine-matics	

C O S O D - I

OBJECTIVES	Argo Abyssal LEG 123	Sulu/ SCS 124	Bon/Mar 125	Bon II 126	Nankai 127	Japan Sea I 128	Japan Sea II 129	SCS Margin	NEA Margin	Geochem Ref	Vanuatu	Lau Basin
1. Processes of magma generation and crustal construction at mid-ocean ridges.	Old crust											
2. Configuration, chemistry and dynamics of hydrothermal systems.						Circulation in backarc spreading						
3. Early rifting history of passive margins.								young passive margin				
4. Dynamics of forearc evolution.			diapirs forearc	forearc eval.	accret prism						forearc collisio	
5. Structure & volcanic history of island arcs.				Bonin volc history		backarc basin	backarc basin			input to volc arc		backarc
6. Response of marine sedimentation to fluctuations in sea level.							young passive margin	carb bank/ passive margin				
7. Sedimentation in oxygen-deficient oceans.												
8. Global mass balancing of sediments.												
9. History of ocean circulation.	old ocean											
10. Response of atmosphere and oceans to variations in planetary orbits.						marginal basin						
11. Patterns of evolution of microorgansims	Jurassic seds											
12. History of the earth's magnetic field.			tectonic evolu- tion									

COSOD II - SUMMARY OF SPECIFIC RECOMMENDATIONS

WG 1 (Global Environmental Changes):

** Paleoclimate:

1. **Neogene HPC/XCB arrays:**
Global arrays, covering crucial oceanographic areas, high-resolution; ideally 20 transects totalling 400-500 drilling days (20-25 days each):

- Pacific: 8 transects (examples: Arctic gyre - Sounders Ridge, transect across W-wind drift - Hess Rise., depth transects and transects across other oceanographic features)
- Indian Ocean: 6 transects (e.g. Maldives, 90^{o}ER, Seychelles Bank)
- Atlantic Ocean: 6 transects (e.g. Norwegian margin, Demarara R., Sierra Leone R., Rio Grande R.)

2. **Paleogene HPC/XCB arrays:**
Global arrays, paleodepth transects; minimum of 12 sites totalling 72 days on site plus deepening many of above mentioned Neogene sites (adds ca. 100-125 days).

** Sealevel:

3. **Atoll transects:**
Array of three transects along length of a major atoll chain including pairs of living/drowned atolls (like Bikini Atoll/Sylvania Guyot); each transect consisting of 4 types of sites:
- apron (2 sites), - atoll rim, - lagoon, - drowned atoll (2 sites) (2nd and 3rd type be drilled with other platforms, e.g. land rig).
Total time for JOIDES Resolution 96 days - 32 days per transect (plus 120 days for other platforms).

4. **Passive margin transects:**
About three transects, each consisting of at least 4 sites in water depth from 200 - 4000 m; each site with operational characteristics as - double HPC & XCB/RCB, - 800-1000 m penetration, - standard logging (occacionally deeper penetration - multiple reentry). 45-90 days per transect. A total of 245 days is estimated for three transects including two deeper RCB sites and two multiple reentry sites.

** Exploratory drilling:

5. **Arctic Ocean drilling:**
Details are presently under study by several groups in Canada, Europe and USA.

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6. **Exploratory drilling along Continental margins** (priority two):
5-10 sites to sample critical stratigraphic/lithologic intervals for understanding (tectonic) evolution of passive margins; ca. 80 days.

7. **Exploratory drilling into Older Sediments** (priority two):
Drilling the Jurassic of Panthalassa; ca. 120 days .

WG 2 (Mantle - Crust Interaction):

** Top Priority:

1. Develop capability to drill **complete crustal sections**; this requires:

   (1) a planning process that can encompass such a long-term objective;
   (2) an engineering development program that is insulated from the distractions of leg-by-leg operations;
   (3) an inclusion of site surveys as essential prerequisites for selection of the optimal drilling targets;
   (4) an allocation of substantial blocks of ship time for development of capability of ultradeep crustal penetration.

   To proceed in this process interim goals should be:
   By 1992: >75% recovery in drillholes of 1000 m basement penetration;
   By 1996: Drilling to 3000 m, well within layer 3;
   By 2000: Drilling to Moho.
   2 to 3 holes of 2000-3000 m basement penetration (ca. 10 months drilling time) are desirable, with the hope of extending one of them to Moho by end of the ten-year-period (additional 12 months drilling).

* Second Priority:

2. **Mantle Composition and Dynamics:**

   Geochemical mapping: Large number (several hundred) of globally distributed holes with <50 m basement pentration covering diversity of crustal targets (e.g. seamounts, plateaus, hot spots, old crust, etc.).
   Ca. 1 year of drilling

3. **Creation of Ocean Crust at Spreading Centers:**

   Integrated approach over several years including:
   (1) extensive mapping and sampling of ridge-crests ..;
   (2) focused (shallow) drilling efforts on carefully selected sites helping to characterize active volcanic system;
   (3) set up of natural laboratory (instruments on sea floor, in holes and in water column);
   (4) selected deep drill holes on well-characterized old crust to obtain complete lava stratigraphy and net effects of hydrothermal processes.
   Ca. 1 year of drilling

4. **Crust-Mantle Interactions at Convergent Plate Margins:**

   Holes on incoming plate, and fore-arc and back-arc environment of overriding plate to establish parameters of 'solid crust circulation'. Start with several holes (ca. 300 m basement penetration) in downgoing plate in a variety of settings.
   Ca. 1 year of drilling.

WG 3 (Fluid Circulation & Global Geochemical Budget):

It is recommended to initially concentrate on one example for active margin and mid-ocean ridge axis each plus one 3000 m hole on a ridge flank; total on-site time estimate for such a program: 3 years. Time estimates are based on slimline riser usage.

** First Priority:

1. **Active Margins:**
Ideally three arrays each consisting of 7 holes, one for a starved margin, fine terigenous and coarse-grained sediment margin each: One deep hole (ca.4000 m penetration) through wedge into oceanic basement and six shallow holes (1100 m) to get horizontal variations; several holes to be instrumented; ca. 268 days on site.
Total on-site time for 3 arrays ca. 804 days.

2. **Mid-Ocean Ridge Axis:**
Two arrays each consisting of 6 holes, one at a sedimented ridge and one at an unsedimented ridge:
Two deep holes (>3000 m penetr.), one in the axial rift (some distance to fluid discharge zone) and one in the distal off-axis recharge zone; four shallow holes (700 m) in different features of discharge zone; 343 days on site. Total time estimate for 2 arrays: 686 days.

* Lower Priority:

3. **Mid-Ocean Ridge Flanks:**
Three arrays for different environments and spreading rates (highest priority in relative old system), each consisting of 5 holes:
One deep hole (>3000 m) and four shallow holes (700 m); ca. 219 days.
Total for 3 arrays ca. 657 days.

4. **(Ocean Basins):**
Heat flow and shallow sampling studies needed before drilling can be recommended (deeper parts of ridge flank hole also might help).

5. **(Passive Margins):**
Two holes, each ca. 1500 m penetration, totalling 72 days on site. But surveys and theoretical studies needed first. (e.g. Florida escarpm.).

There are critical new technologies for future hydrogeological investigations such as: - stabilization of re-entry holes in unstable sedimentary sections; - high temp. drilling technology; - ultra deep drilling capability; - improved hole isloation techniques; - narrow kerf drilling and in-situ measuring ahead of drill bit; - non-drillship reentry of boreholes; - techniques to measure flux through unsedimented sea floor.

WG 4 (Stress & Deformation of the Lithosphere):

** Global state of stress of oceanic lithosphere

1. **Develop global stress map:**

Three-phase approach recommended (only phase two is considered to predominantly cover WG4 topics):
1. deepen appropriate holes of opportunity > 100 m into basement;
2. **drill numerous holes along and across plates, establish ocean-bottom geophys. observatories at 25 sites (minimum 11)**; each hole 100-200 m basement penetr.; 7-10 days per site.
3. use deep holes in crust for stress measurements (1 week per hole).

* Deformation history of plate margins/edges:

2. **Passive Continental Margins:**

Typical margin requires 3-4 sites. Three margin types identified (non-volcanic, volcanic, rift-transform); conjugate margins of previously drilled examples preferable. It is recommended to first do the shallower sites, and deeper sites when technology becomes available. Minimum program:
- Select a non-volcanic and a volcanic margin; a total of (a) two 4-km sediment penetr. sites (240 days); (b) two 1 km sediment plus 2-km crystalline-rock penetr. sites (120 days).
- One 60 day leg on rift-transform margin; - one to two legs for a deep hole addressing major fault or crustal boundaries.

3. **Convergent Margins:**

Integrated approach, with elements undertaken in appropriate squence (extensive geophysical investigations first); two phases:
1. Phase: Five forearc transects, each consisting of 5 sites across toe of forearc (0.5-1 km deep holes; some sites with arrays of HPC holes); estimated total time: 12 months.
2. Phase: Four sets of 2-3 deep holes (2-4 km) in forearcs of interest to investigate deep seated deformational mechanisms (requires up to 9 km drillstring, control of fluid pressures in hole). 2 months per forearc, totalling 8 months on-site.

4. **Mid-Ocean Ridges:**

Two phases recommended;
1. Phase: Series of shallow holes (100-200 m), located in closely-spaced arrays (<1 to tens of km) along and across the strike of ridge at diagnostic localities (e.g. ridge/transform intersect. etc.); total of 2-3 legs required !
2. Phase: Several deep holes (2-3 km) within some of the arrays of shallow holes (selection following 1.Phase, linked to WG 2); absolute minimum: One 3000 m hole at fast and slow spreading ridge each.

WG 5 (Evolution and Extinction of Oceanic Biota):

Defined the EPOC program (evolutionary processed in oceanic communities) with three main objectives to be achieved/addressed by drilling:

1. Evolutionary global ocean drilling array; spanning all oceans and all biogeographic provinces;
2. End Cretaceous extinction and early Cenozoic recovery;
3. Origins and early radiations of modern microfossil groups.

All sites recommended have to be multiple-drilled, continuously recovered. Total number of sites recommended: 230 (see below); total time estimate: 4 years. [Note, that ca. 50 % of sites will also match requirements of WG 1.]
For implementation, the following priorities have been defined:

1st Priority:

1. **Late Cenozoic HPC/XCB array (plankton):**

   Global array of holes, high geographic resolution, continuously recovered sections, addressing evolution of **planktonic biota**.
   Ca. 100 (additional) holes (at the end of currently planned Indian and Pacific drilling program) needed.
   (Covers EPOC objective 1 and 3)

2. **Cretaceous and Jurassic sequences:**

   Wide-spaced global array, continuously recovered sections, addressing evolution of all groups.
   Ca. 30 holes down/back into Cretaceous and Jurassic sediment sections.
   (Covers EPOC objective 2 and 3)

2nd Priority:

3. **Late Cenozoic HPC/XCB array (benthos):**

   Global array of holes, high geographic resolution, continously recovered sections, addressing evolution of **benthic biota.**
   Ca. 100 (additional) holes needed.
   (Covers EPOC objective 1 and 3)

Time estimates for implementation of COSOD II recommendations

WG	PRIORITY	TOPIC	ARRAYS/TRANSECTS	SITES	ON-SITE TIME [DAYS]	TOTAL TIMES
	(1)	Neogene	20 transects		400-500	
	(1)	Paleogene		12 sites	72	
				deepen Neogene sites	100-125	
	(1)	Atolls	3 transects,	4 holes each	96	
	(1)	Passive margins	3 transects,	4 sites each	245	1038
	(1)	Arctic Ocean	to be defined		to be defined	
	(2)	Expl.contin.margins		5-10 sites	80	
	(2)	Jurassic (Panthalassia)		several	120	200
	(1)	Crustal section		2-3 3km-holes	300	
				one deepened to Moho	365	665
	(2)	Mantle composition		n x 100 holes with 50m bsmt.	365	
	(2)	Creation of crust		Selected sites on ridge & old cr	365	
	(2)	Cr.-Mantle interact	Several sets of a few	300m-bsmt holes on downg. plate	365	1095
	(1)	Active margins	3 margins	7 holes each (one 4km-hole)	804	
	(1)	Mid-oc.ridge axis	2 arrays	6 holes each (two >3km-holes)	686	1490 (1095)
	(2)	Mid-oc.ridge flank	3 arrays	5 sites each (one 3km-,four 700m-holes)	657	
	(2)	Ocean basins	to be determined		to be determined	
	(2)	Passive margin		2 1.5km-holes	72	729
	(1)	Global stress map		deepen holes of opportunity	?	
				>25 200m-bsmt. holes	175-250	
				measurement in deep holes	7 days/hole	250
	(2)	Passive margins	minimum:	2 4km-, 2 3km-holes with 2km bsmt.	360	
			plus two legs on	rift-transf.margin and major fault	120	
	(2)	Converg.margins	5 forearc transects	5 sites each	365	
			4 sets of	2-3 2-4km-holes	240	
	(2)	Mid-oc.ridges		series of shallow holes	90	
				several >2km-holes	?	1175
	(1)	Cenozoic-Plankton	global array of	100 sites	545	
	(1)	Jurassic/Cret.	global array of	30 sites	365	455*
	(2)	Cenozoic-Benthos	global array of	100 sites	545	277*

[* 50% of sites acquired within WG1 priorities]

Total on-site time [1.Priorities]: **3898 d =10.8 years** [=16.6 operational years]

Total on-site time [2.Priorities]: 3466 d = 9.5 years [=14.6 operational years]

COSOD II

	Global Environment	Crust Mantle Interaction	Fluid Circulation in the Crust	Stress in the Lithosphere	Evolution Processes
Drilling Targets Achievable with present drilling technology and rate of developments.	1> Neogene: Understanding the ocean system. 1> Paleogene: Deciphering onset of modern circulation. 1> Sea Level: Atoll and Passive margin transect* 2> Older sediments*	Mapping Ocean Crust Chemistry Crust/Mantle interactions at active margins: drilling subducting plate Creation of Oceanic Crust*	1> Shallow arrays at active margins. 2> Shallow arrays in passive margins.	Regional stress maps Seismic arrays Convergent margin arrays/Phase 1. Passive margin arrays/Phase 1.	1> Late Cenozoic global array. 1> Cretaceous and Jurassic sequences.*
Drilling Targets requiriment deep (> 3000 meters) penetration.	1> Arctic exploration. 2> Deep passive margin exploration.	Complete Crustal Sections. Crust/Mantle interaciton in active margins: over-riding plate. Deep crustal targets at ridge crest.	1> 3000 m, >350^{o}C deep crustal holes at ridge crest and ridge flanks 1> Deep water, deep penetration in active margins.	Convergent and Passive margin Phase 2. arrays - Deep drilling.	Older sections requiring deep penetration.

* Some targets may require deep drilling and these objectives maybe compromised by limited drilling capabilities.

COSOD II

Report of the JOIDES PCOM Subcommittee

on JOIDES Panel Structure

Sun River, Oregon, December 1-2, 1987

I. Charge:

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

2. Ensure that any proposed increase in thematic panels is the minimum necessary to adequately represent the global themes addressed by Ocean Drilling.

3. Consider the role of regional expertise.

II. Subcommittee Membership:

T. Francis (UK, PCOM)
R. Heath (U.S. EXCOM, Chair)
M. Langseth (U.S., PCOM)
M. Leinen (U.S., unable to attend meeting, but reviewed report)
A. Taira (Japan, PCOM)
N. Pisias (PCOM, observer on December 1, 1987)

III. Issues considered by the Subcommittee:

1. How can the JOIDES panel structure be responsive to COSOD recommendations?

2. How can the panel structure ensure that thematic objectives are accomplished?

3. How can the panel structure ensure that drilling proposals are treated fairly and impartially?

4. How can the panel structure facilitate effective 10-year planning?

5. How can the panel structure provide optimum technical advice to PCOM?

IV. The findings of the Subcommittee are addressed under the following headings:

1. Roles and operation of thematic panels.
2. Application of regional and technical expertise.
3. Flow of science planning and proposals.
4. Comments on technical panels.

1. Roles and operation of thematic panels.
The Subcommittee considered four possible models for thematic panels:

(a) 3-panel model: Retain the present structure and responsibilities.

(b) 4-panel model: Retain the present LITH and TEC panels, but split SOHP into two panels, one with responsibility for Ocean Paleoenvironment and Biological Evolution (OPB) and the other for Diagenesis and Sediment Processes (DSP).

(c) 6-panel model: Split LITHP into hard rock and hydrothermal panels, split TECTP into active and passive margin (or plate margin and intra-plate) panels, and split SOHP as in 4-panel model.

(d) 7-panel model: Split LITHP and SOHP as in 6 panel model, and split TECP into intra-plate and active and passive margin panels.

Based on point 2 in the Charge, we favor the 4-panel model, which addresses the widespread concern that has focussed on the overly broad responsibility of the present SOHP.

2. Application of regional and technical expertise.

The Subcommittee feels that the thematic objectives of the ODP, as summarized by COSOD, can best be achieved by concentrating the JOIDES scientific advisory responsiblity in the four (proposed) thematic panels. As PCOM identifies logical geographic aggregates of theme-based sites, it should create ad hoc Detailed Planning Groups (DPG's) to provide it with the expert thematic, regional and technical advice necessary to plan an optimal drilling schedule. This structure meets the Panel Chairmen's concern that regional panels have finite lifetimes (Appendix 15). The existing regional panels should be disbanded and an initial set of DPG's should be constituted as soon as practicable.

3. Flow of science planning and proposals.

(a) COSOD 1, 2 ...N provides overall scientific guidance.

(b) [On the basis of recommendations from the thematic panels PCOM develops a 10-year plan allocating blocks of time to geographic areas, and within areas to major themes. This long-range plan should be published widely as a stimulus and guide to scientists interested in submitting proposals. To avoid unreasonable rigidity, PCOM can revisit the allocation periodically to take account of the development of the thematic areas and the presentation of new ideas.]

(c) Thematic panels (augmented by ad hoc subgroups, where necessary) define and prioritize scientific problems and develop long-range prospectuses that are consistent with PCOM's time allocations. The prospectuses should identify needed technology and the time required to develop it (TEDCOM's advice will be important here), and should specify exemplary areas where objectives could be met.

(d) Thematic panels review and assemble proposals into blocks compatible with PCOM's allocation. All complete proposals should be reviewed for scientific feasibility and quality by external reviewers to ensure fair and impartial consideration. Members of ad hoc subgroups and former chief scientists, for example, would be appropriate reviewers. The panels should encourage multi-investigator long-term thematic proposals to address some of the "persistence" issues raised by COSOD and other commentators.

(e) PCOM creates an ad hoc Detailed Planning Group (DPG) for each cluster of proposals. Each DPG should include formal member country representation, have a life expectancy of several years, and include appropriate thematic, regional, and technical expertise, including representation of the relevant thematic panel(s). The Subcommittee believes that the total member-country representation on ad hoc thematic panel subgroups and DPG's should roughly match (in terms of people and travel cost) the current representation on regional panels. PCOM will have to manage the numbers.

(f) [PCOM allocates blocks of time to geographic areas and, within areas, to major themes.]

(g) DPG's prepare detailed drilling schedules (to include technical and logistical details) for clusters of legs.

(h) PCOM establishes the final short-term (1-3 years) drilling schedule.

4. Comments on technical panels.

(a) The Subcommittee finds that the present technical panels are important components of the JOIDES planning apparatus, and should be retained.

(b) The Subcommittee recommends the creation of a Shipboard Measurements Panel (SMP) to oversee geochemical, geotechnical and other shipboard analytical techniques and capabilities. SMP's role would be analogous to that of DMP for downhole measurements.

(c) The Subcommittee recommends that the Safety Panel should have a formal liaison to the SSP to ensure that site surveys do not overlook essential safety information.

V. Conclusions

1. The present advisory system requires only adjustment, not demolition.

2. The 10-year plan should be reviewed and updated annually based on interaction between PCOM and the thematic panels. Major changes in the 10-year plan should be made only with strong justification (such as the development of new technology, major new concepts, etc.). Changes resulting only from changing panel membership should be minimized to retain the interest and support of the affected scientific community.

3. The 10-year plan should be extended every three years using a planning procedure similar to that described above.

GRH:pf
dkp

A P P E N D I C E S

Submissions to the Subcommittee

1. PCOM Meeting Book, Sun River, Item P, p.26.
2. N. Pisias memo to PCOM members dated 3 Sept. 1987.
3. C. Sancetta letter to N. Pisias dated 15 Sept. 1987.
4. N. Pisias memo to panel chairman dated 2 Sept. 1987.
5. M. Arthur/M. Leinen memo to R. Larson dated 27 Nov. 1987.
6. A. Meyer summary of JOIDES science advisory structure dated Dec. 1985.
7. Extract from PCOM minutes for Jan. 1986.
8. Extract from LITH panel minutes for 13-15 Ma 1987.
9. Extract from TEC panel minutes for 27-29 April 1987.
10. Extract from SOH panel minutes for 31 Aug. - 2 Sept. 1987.
11. U. von Rad letter to T. Francis dated 19 Oct. 1987.
12. M. Langseth statement for Subcommittee, undated.
13. G. Eglinton/P. Meyers/B. Simoneit submission on molecular stratigraphy, undated.
14. C. Langmuir "Revision to PCHMN minutes," undated.
15. Report of annual panel chairmen's meeting, 29 November 1987.

GRH:pf
dkp

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.

JOIDES Planning Office

APPENDIX 2

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.

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. The subcommittee should start initial discussions and plan to meet during our November meeting to present an initial overview on the last day of the annual PCOM meeting;

6. 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.

OCEAN DRILLING PROGRAM

APPENDIX 3

Lamont-Doherty Geological Observatory of Columbia University | *Palisades, N.Y. 10964*

Cable: LAMONTGEO
Palisades New York State
TWX-710-576-2653

Telephone: Code 914, 359-2900

Dr. Nicklas Pisias, PCOM Chair
Oregon State University

Sept. 15, 1987

Dear Nick,

I have read with interest the outline for ODP proposal reviews as drafted by PCOM during their August meeting in Japan. In general, I support the recommendations, especially that of notifying proponents as to status of their proposals. However, there are potential weaknesses in the procedure as described, and I hope your subcommittee will find a way to rectify them.

The outline suggests that a proposal might be read and reviewed by only one (thematic) panel, which has already defined the important themes to be addressed by drilling. I am sure you will agree that, no matter how diverse and knowledgeable the panel members, it is impossible adequately to represent the entire spectrum of possible research in marine geoscience. To take a recent example, there is growing concern that the area of sediment diagenesis and metallogenesis is not well represented on either the LITHP or the SOHP panels.

Certainly, a thematic panel should define important themes, to serve as guidelines for drilling. However, a proposal should not be rejected solely because it involves a different--perhaps new and exciting--approach. Surely PCOM did not mean to suggest such a restrictive attitude, but that is implied by the guidelines. One can imagine a panel defining as important themes only those topics which correspond directly to their own personal areas of research; indeed, it would be surprising if they did not. To be told that one's idea is unacceptable because it does not address someone else's idea of what is important......well, how would you feel?

Related to this is a second weakness: that one panel may have sole responsibility for deciding the merit of a proposal. In principle, it is unwise to put so much power in the hands of a single group; a system of checks and balances is always desireable. Therefore, I suggest that at some point in the process there be a second group who see <u>all</u> proposals. If these people feel that a valid idea has been overlooked or given short shrift, they could raise the question, asking the appropriate thematic panels to reconsider, or to explain more fully their reasons for rejection. This "watchdog" group might be PCOM itself, or a regional panel (which, under the new guidelines, is little more than a clearinghouse). This is not to say that the watchdog could over-ride the decision of the thematic panels. But it would obviate both of the problems described here, and ensure that the program would be perceived as a genuinely democratic, open system, rather than a tight little in-group.

Sincerely,

Constance Sancetta

cc: G. Ross Heath
Mark Langseth
Margaret Leinen
Asahiko Taira
Tim Francis

APPENDIX 4

2 September 1987

To: Panel Chairmen
From: Nick Pisias, PCOM Chairman
Subject: Proposal Review Process

In order to more seriously address the proposition that ODP be a thematically driven program, PCOM discussed the JOIDES advisory structure at its recent meeting in August. PCOM feels that major changes in the panel structure should occur in an evolutionary rather than a catastrophic fashion. To start this process, PCOM has named a small subcommittee made up of four PCOM members (two U.S., two non-U.S.) plus Dr. G.Ross Heath of EXCOM; the are charged with providing recommendations for long-term changes in the panel structure. PCOM members are Asahiko Taira (J), Tim Francis (U.K.), Marc Langseth (LDGO), and to provide discipline balance and a fresh view, Margaret Leinen, who will be rotating onto PCOM for the University of Rhode Island.

On a short-term basis, PCOM adopted the attached "proposal evaluation process". The intent of PCOM is to have the thematic panels define which proposals should be included in the prospectuses prepared by regional panels. 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. Regional panels are asked to evaluate only those proposals passed on by the thematic panels. The regional evaluation should be in terms of the proposal's maturity, adequacy of documentation and probability of success. All this information must be passed on to PCOM for formulation of the ODP drilling schedule.

In addition, PCOM adopted a more formal evaluation procedure for specific proposals. Many of you have received letters from proponents asking why certain proposals were not included in the drilling prospectus, specifically with respect to the Indian Ocean. In some cases it has been difficult to extract the evaluations for these proposals from the "written record." As it is felt that at the least, scientific courtesy would require better feedback to proponents, PCOM requests that the enclosed form be used to summarize panel review of proposals. The form will be kept in the proposal files in the JOIDES Office with a copy returned to proponents.

It is the concensus of PCOM that ODP should be a proposal oriented program and that every effort should be made to have ODP operate as an open system. It is my feeling that having evaluations more formalized makes it possible for proponents, especially ones not involved in the panel structure, to receive evaluations of their proposals; making it possible for them to update and clarify their proposals. Clearly, it would be unacceptable to submit a proposal to an agency like NSF, have it turned down, and never receive any of the reviews on which that decision was based.

So that you do not panic, we will ask that you complete the new forms only for proposals submitted after August, 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.

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 5

November 27, 1985

MEMORANDUM

TO: Roger Larson, Chairman, JOIDES Planning Committee
FROM: Michael A. Arthur, Chairman SOHP and member Red Sea Working Group,
Margaret Leinen, member Lithosphere Panel and Western Pacific Panel

RE: JOIDES Panel Structure

It has now been over 2 years since the present JOIDES panel structure was initiated for ODP and we believe that there has been sufficient time for the community to judge how well the system functions. We believe that it is time to re-evaluate the structure, particularly in light of the fact that several panel chairmen have resigned during the last year, some of them because they felt frustrated in their attempts to promote and represent their panel's views.

The rationale for the new ODP panel structure seems to have been based on at least two views in the community: one was an underlying impression from reviews of the program that the JOIDES advisory panel organization during the days of the Deep Sea Drilling Project was not optimum for setting and prioritizing objectives for the new Ocean Drilling Program; another that it was an opportune time to present a new face to the community. We believe that the organization that evolved ignored the fact that the panel structure during DSDP did work very well overall and there were aspects of it that were quite good. We believe that the present panel structure invites conflict between thematic and regional panels as well as forcing a substantial duplication of effort. In addition, we believe that it creates obstacles for effective long-term planning. Herein we offer our unsolicited opinions about the shortcomings of the present structure and some suggestions for improvements to be made.

We believe that the fundamental problem is that the present structure places the thematic and regional panels on an equal footing. We wholeheartedly believe that substantial input from geologists and geophysicists with expertise in specific regions is required to develop reasonable drilling targets, but we believe that the fundamental problems that all of us would like to answer by drilling are process-oriented, not geographic. We note that COSOD was not organized to examine problems in specific ocean basins, but instead dealt with its broad mandate by highlighting important scientific problems of global significance within certain fundamental thematic areas. In our view it was essentially this document (which provided the evidence of consensus in the marine geology community for drilling to solve geologic problems) that launched ODP, not the need for further regional reconnaissance.

One of the best illustrations of the ineffectiveness of the present structure for planning purposes is the evolution of the proposed drilling program in the Indian Ocean. After months of discussion by all panels, PCOM requested that the IOP put together the drilling program. In the resulting plan many top-ranked priorities of thematic panels, which were based on problems identified by COSOD, were essentially ignored. For example, the first priority Indian Ocean objective of TECPAN, the Makran accretionary prism and slope basins, has been dropped entirely from the program outlined by IOP for reasons that are not apparent in the minutes of either panel. A high-priority objective of SOHP was a deep stratigraphic test in the Somali Basin. This objective was proposed as part of the broad global theme of correlating paleoceanographic events with margin acoustic signatures. This theme was identified in the COSOD document as having fundamental importance, but was also dropped from the drilling program with this comment : "...and [we] are especially opposed to devoting one plus leg to the deep north Somali Basin site. Single-site legs are a luxury not yet possible in the reconnaissance phase of drilling in the Indian Ocean." We believe this is a pre-emptory attitude about appropriate use of the drilling tool, and would hate to see a return to the"cover the globe" philosophy of drilling that typified much of DSDP. In addition, we have been told that we must spend some time in the Red Sea for "logistic" reasons, although many of the proponents believed that it would be wise to await availability of drilling tools that would withstand the rigors of penetrating hot, corrosive hydrothermal fluids and for deployment of the riser/BOP system that will allow penetration of evaporites and associated strata before bringing the *Resolution* into the Red Sea for one or more legs.

The above examples serve to illustrate the competitive functioning of the multiheaded structure that we now have. Our intent is not to throw stones at the Indian Ocean Panel, its members, or any other regional panel. Having been on regional panels we know for a fact that they view themselves as geologists first, regional experts second. The regional panels are frustrated by the lack of clarity in the panel structure as well. For example, after hours of trying to decide how to respond to PCOM insistence for a regional drilling plan for the Western Pacific, the panel rejected a regional approach and finally decided that the only course that would result in a drilling plan with integrity was to identify thematic objectives and design a drilling plan around them. This planning precisely duplicated that being done by TECPAN and LITH panel. In this situation with many interests competing for a piece of the temporal pie, the ultimate prioritization of drilling targets is being left to the regional panels. We believe that this is inappropriate for a program that is trying to understand geologic processes in an global context.

In the case of DSDP, the short-term objectives resulted from the pressure of short-term planning. Every two years a new "fundamental contribution to the science" had to be featured to ensure that the project would survive. With ODP we had the opportunity, and were asked, to consider a set of more focussed objectives with which we could develop a long-term plan for in-depth study. We believe that attempts to do such planning have been frustrated by the infrastructure. For example, the response of LITH panel to the ODP mandate was in the spirit of COSOD; they focussed on several significant problems confronting researchers on the ocean lithosphere, and identified a few highest priority targets in which to study them, including but not restricted to,their "natural laboratories". Yet, some of their highest priority objectives have been passed over to include drilling of "ocean crustal objectives" in other areas that were not promoted or endorsed by the LITH panel until it was clear that they would be on the schedule with or without LITH panel support and that some priorities for sites should be discussed.

We also see substantial duplication of effort between the JOI-USSAC sponsored workshops and similar non-US workshops on regional objectives and the regional panels. In effect, the workshops have performed the job of a regional panel for large areas, like the Indian Ocean, and smaller subregions, like the northeast Pacific. They have provided a forum for discussing thematic concerns and have contributed site-specific proposals and data for consideration and prioritization by the advisory panels. We believe that such workshops provide a good alternative to regional panels. While the JOI-USSAC workshops were established to provide a forum only for U.S. interests in these regions, we believe that the regional workshop concept could certainly be expanded to provide opportunities for other member nations as well. For example, similar workshops could be requested from other countries instead of regional panel participation. Another option would be for JOIDES to hold international workshops instead of separate workshops in different countries. It would seem to be much simpler and less expensive to continue such workshops prior to planning for each ocean basin or region and to allow them to feed directly into thematic panels, eliminating the necessity for the regional panels to meet continuously for the life of the program.

We emphasize that we do not believe that it is appropriate to discontinue all regionally organized input during the planning process and that we most definitely do not want to limit participation in the planning process. During DSDP scientists on the thematic panels often did not have access to the necessary regional geological and geophysical data required in order to develop specific site locations. However, with the approval of PCOM, the thematic panels were able to convene small regional (or topical) working groups as necessary. This process was efficient and responsive to the needs of the thematic panels. We favor a more flexible, ad hoc, arrangement like that one, in which thematic panels could request temporary regional working groups, or could request that they have experts with specific regional interests meet with them for a few meetings while planning for a specific region is being done. We believe that there will be less conflict and duplication if those with regional expertise work with the thematic panels rather than parallel to them.

It is also our opinion that the themes outlined in the COSOD document suggest the optimum organization and hierarchy of advisory panels. These themes are Ocean Lithosphere, Tectonics, Sedimentary Processes, and Ocean History. We suggest that these foci be represented by thematic panels. We recognize that certain technical panels, like the Downhole Measurements Panel and the Information Handling Panel are also necessary to serve as advisors to both the thematic panels and PCOM. We suggest that a Geochemistry Panel be revived and added to these two. Miriam Kastner has called attention to the fact that many important geochemical processes like diagenesis and crustal alteration "fall between the cracks" in the present structure. The problem is not that there are no geochemists on the panels, but that 1) multidisciplinary geochemical problems like diagenesis are not appropriately handled only by panels which are primarily concerned with the themes of ocean lithosphere formation and ocean history, and 2) that one geochemist on a such a panel has little ability to have geochemical problems considered routinely. A typical example is in the field of organic geochemistry, which is represented in its entirety by one person on SOHP. We suggest that the Geochemistry, Downhole Measurements and Data panels be formed as technical panels to advise PCOM and the thematic panels. One conceptual arrangement of these panels is attached.

As a closing comment we emphasize that we hope that PCOM will accept our suggestions in the spirit they were offered -- as the prelude to an open discussion of the panel structure and genuine retrospective on the last two years of planning. They do not represent "sour grapes" and our specific comments on the drilling proposal are included to illustrate specific points and certainly are not meant to denigrate our fine colleagues on regional panels who have wrestled with the problem of how to plan drilling and have tried to solve it as best they could.

SUGGESTED PANEL MANDATES

GEOCHEMISTRY PANEL (Service)-CHEMPAN

The JOIDES-ODP Geochemistry Panel will be staffed by approximately 10 geochemists, more or less equally divided between organic and inorganic geochemical specialties. The primary responsibility of the Geochemistry Panel is to provide advice and recommendations to ODP, JOIDES thematic panels and PCOM on special methods of sampling, sample handling, and curating required for specific organic and inorganic geochemical analyses; these include, but are not restricted to, recommendations for development, maintenance and deployment of special devices needed for sampling (in situ or on board ship), storage and handling of samples, and distribution of samples to the geochemical community. In addition, the Geochemistry Panel will consider and recommend specific research and sampling plans to be implemented within the drilling program recommended by other panels and implemented by PCOM. These might include recommendations for acquisition of special "dedicated cores", such as third APC sequences where there is intense interest in the geochemistry of sediments and organic matter, and/or "high resolution" sampling and sediment squeezing for pore waters where interesting interstitial water geochemical gradients are expected; recommendations might also include deployment of the pressure core barrel or in situ pore water sampler where gas hydrates are possible or expected, special instrumentation of drillholes in hydrothermal systems, etc.

OCEAN HISTORY-STRATIGRAPHY PANEL (Thematic)-OH/STRAT

The Ocean History-Stratigraphy Panel will be staffed by 14 specialists and generalists in the area of paleoclimatology, paleoceanography, geochemistry (inorganic, organic, isotopic) seismic stratigraphy and biostratigraphy (see below). The primary responsibility of the OH/STRAT Panel is to formulate and prioritize major themes for drilling that relate to the history of surface-and deep-water circulation, chemistry, thermal structure and biota of the Mesozoic-Quaternary oceans, and to identify and to develop or to endorse proposals for drilling in the regions that would best lead to an understanding of the major paleoceanographic and paleoclimatic problems. In particular the panel would consider drilling objectives that would help to understand causes, consequences and rates of global changes in climate and their impact on ocean circulation, ocean chemistry and biotic evolution using geochemical-isotopic, paleontologic and other stratigraphic criteria. This charge understandably involves the interactions of plate motion, volcanism, sea level, climate and oceanic circulation-chemistry, and it is anticipated that some drilling targets will be formulated to test models of these interactions. In addition, the OH/STRAT Panel will be responsible for developing and endorsing programs that lead to improvements in stratigraphic resolution and global correlation of sequences (bio-magneto-tephro-chemostratigraphy), and for providing advice to ODP on questions of a stratigraphic nature, appropriate sampling, technological developments related to magnetostratigraphy, etc.

The OH/STRAT Panel will have the ability to convene relatively small thematic or regional working groups that will be staffed and will meet as approved by PCOM. The regional working groups could be formed in conjunction with one or more thematic panels. The primary regional input to the thematic panels, however, will be in the form of proposals that result from regional working groups mandated by PCOM or through sponsored national or international workshops.

Panel Membership (type of person suggested--more than one indicates several desirable)
(mix of Mesozoic-Cenozoic workers)

1. Paleoceanographer-stratigrapher-isotopes (N. Shackleton; M. Arthur)
2. Paleoclimate Modeller (E. Barron)
3. Paleoceanographer-stratigrapher (H. Thierstein; C. Sancetta or J. Barron; R. Thunell)
4. Geochemist-sedimentologist-paleoceanographer (W. Dean or M. Leinen)
5. Seismic stratigrapher-phys. props.-paleoceanographer (L. Mayer)
6. Magnetic stratigrapher (D. Kent or L. Tauxe)
7. Generalist-mass balances-models (W. Hay)
8. Biostratigrapher-paleoceanographer-evolutionist (J. Kennett or W. Berggren)
9. "Paleometeorology-atmospheric transport"-paleoceanographer (D. Rea or M. Sarnthein)
10. Chemical stratigraphy-chemical diagenesis (M. Bender or P. Baker)
11. Organic geochemist-paleoceanographer (J.-P. Herbin or P. Meyers)

SEDIMENTARY PROCESSES PANEL (Thematic)--SEDPRO

(alternative name SEDIMENTARY FACIES PANEL--SEDFAC)

The Sedimentary Processes Panel will be staffed with 14 specialists and generalists in the fields of sedimentary processes, sedimentary facies and lithostratigraphy, seismic stratigraphy, and chemical diagenesis (see below). The SEDPRO Panel's primary responsibility will be to develop priority thematic objectives related to marine sedimentary processes and their relative importance in construction of marine stratigraphic sequences through time, particularly, but not limited to, those processes that transport clastic material from shallower water environments into the deeper ocean basins and transportation and reworking of sediments within ocean basins and their seismic expression. These processes include redeposition by slumps, slides, debris flows and turbidity currents and erosion, entrainment and transport by bottom currents. The mandate includes construction of drilling programs that investigate the composition and geometry of sedimentary facies on modern and ancient deep-sea fans, archipelagic aprons, current-influenced depositional ridges, atolls and guyots, and carbonate banks and slopes in order to develop a better understanding of the controls on composition and facies distribution exerted by tectonics and basin geometry and sea level. In addition, the SEDPRO Panel will consider problems of sediment diagenesis related to initial composition, burial depth and compaction, and thermal regime.

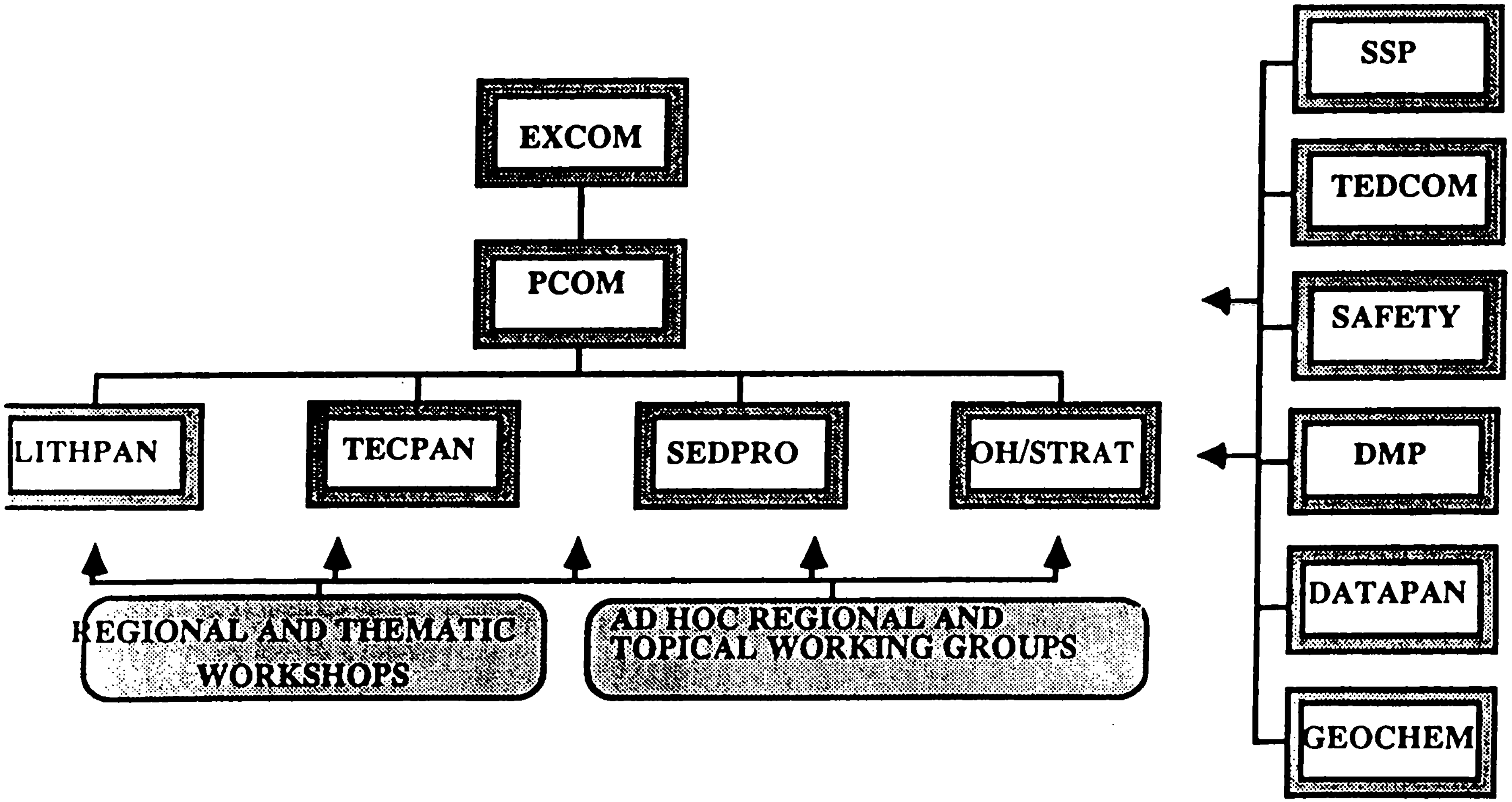
The SEDPRO Panel will have the ability to convene small regional or thematic working groups from time to time as necessary and approved by PCOM, and in conjunction with other thematic panels. The primary regional input, however, will be in the form of proposals resulting from regional working groups mandated by PCOM and from sponsored national or international workshops.

Panel Membership (type of person suggested--more than one indicates several desirable) (suggested members designed to overlap and cover several disciplines)

1.Seismic stratigraphers-lithostratigraphers (B. Tucholke; R. Sarg or J. Austin; G. Mountain)
2.Deep-Sea Fan specialist (W. Normark)
3.Sediment Redeposition-margin processes (R. Embley)
4.Drift Sediments-abyssal circulation (S. Shor or K. Miller)
5.Rock magnetic properties (J. King or M. Ledbetter)
6.General sedimentologist (fans, contourites, etc.) (D. Stow)
7.Chemical sedimentologist -hydrothermal and/or diagenesis (M. Leinen or M. Kastner)
8.General sedimentologist (carbonates, diagenesis, etc.) (R. Garrison)
9.Shallow-water carbonate sedimentologist (W. Schlager or H. Mullins or R. Matthews)
10.Global generalist-sediment mass balances (W. Hay or R. Berner)
11."Volcanic edifice" sedimentologist (guyots, atolls, etc.) (S. Schlanger or E.L. Winterer)

LITHOSPHERE (LITHPAN) AND TECTONICS (TECPAN) PANEL mandates would remain essentially unchanged with the exception that aspects of "sediment diagenesis" would be removed from LITHPAN's mandate.

REGIONAL Panels could be left largely unchanged and/or some members could move onto the thematic panels as original members rotate off on a 2-3 yr. schedule. The Regional Panels would then meet as needed rather than the present mandatory 3 times per year and would feed input into thematic panels through more effective liaison. ARP, SOP and IOP, for example, could now be disbanded since they have had substantial input into the program and plans for drilling are well underway. The WPAC and CEPAC panels could operate for the next 1-2 yrs. as necessary, until plans for Pacific drilling are well-formulated.


EXCOM
PCOM
LITHPAN
TECPAN
SEDPRO
OH/STRAT
REGIONAL AND THEMATIC WORKSHOPS
AD HOC REGIONAL AND TOPICAL WORKING GROUPS
SSP
TEDCOM
SAFETY
DMP
DATAPAN
GEOCHEM

APPENDIX 6

EVOLUTION OF THE JOIDES SCIENCE ADVISORY STRUCTURE (SAS)

1. Since its inception in 1968, the JOIDES Science Advisory Structure has evolved from what were initially rather ad hoc panels through a thematic panel structure to the present mix of thematic and regional panels.

2. In 1968, the advisory panels had their main emphasis on regional and technical matters but within two years these had developed to cover a number of thematic issues. By 1974, the IPOD thematic panels had been formed and the regional panels were being phased out. The thematic panels (covering smaller scientific areas than the present thematic panels) operated successfully during the IPOD period and into the initial planning for ODP. Regional matters, during IPOD, were covered by the formation of ad hoc regional working groups, which contrasts with the standing regional panels of ODP.

3. In September 1982, the Executive Committee asked PCOM to devise an advisory structure more appropriate for achieving the objectives of the ODP and to phase-out the existing IPOD structure. Following extensive discussions, a new panel structure was accepted by PCOM in 1983, and in January 1984, the present structure was instituted. The history of the panels' evolution from 1968 to the present is shown in the attached diagrams. The full terms of reference of the present structure can be found as Annex 1 in the PCOM Policy document.

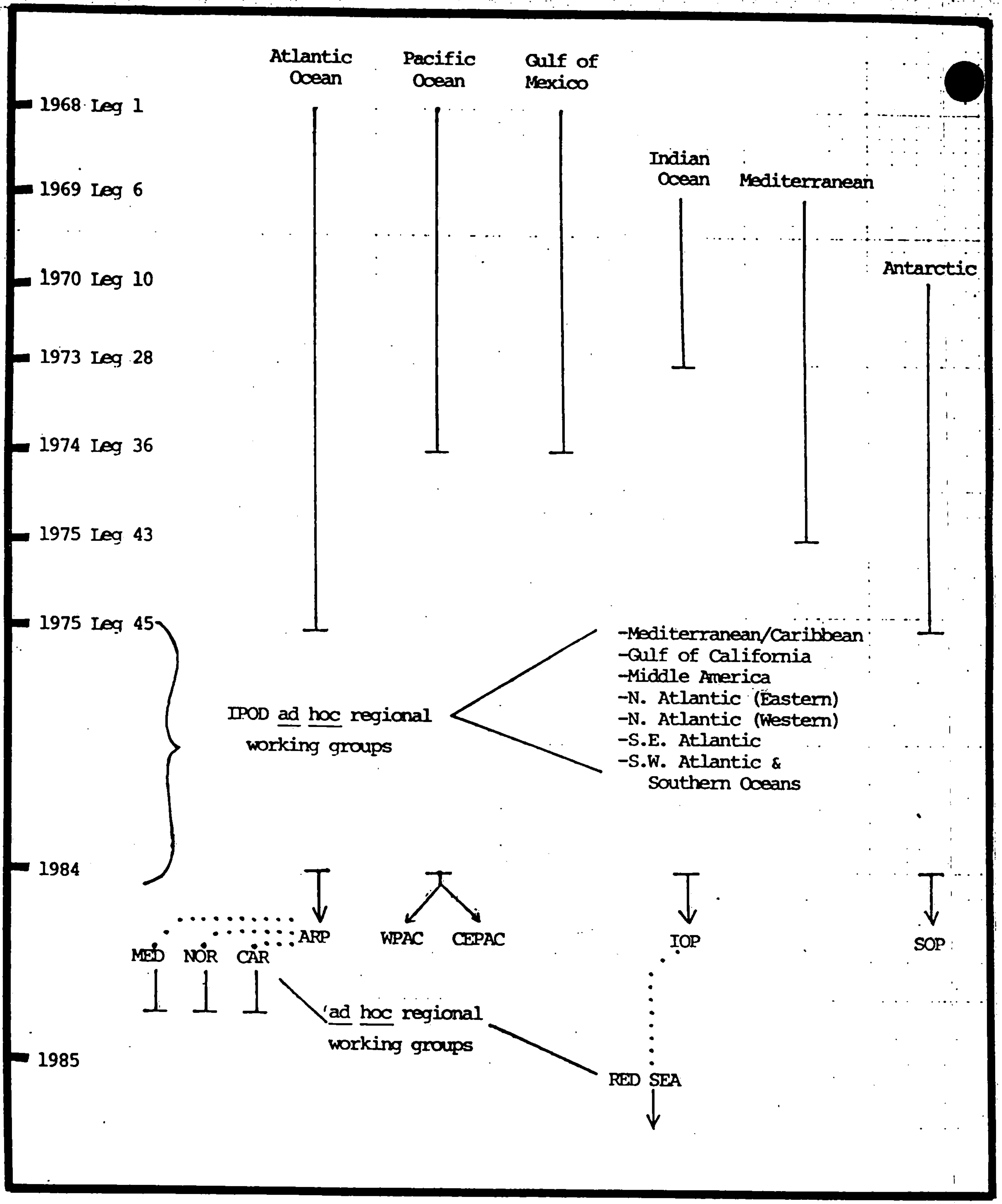
4. At the October 1985 meeting, members of PCOM expressed concern at the effectiveness of the current structure in developing well-balanced programs. Some concern was also expressed at the apparent predominance of the regional panels and the breadth of the thematic panels in devising a drilling program to meet the essentially thematic objectives of COSOD.

5. Correspondence has been received by the JOIDES Office from G.M. Purdy (LITHP Chairman) and from M.A. Arthur (SOHP Chairman) and M. Leinen (WPAC and LITHP member) criticising the present structure and advocating a revised panel system. This correspondence is also included in the papers.

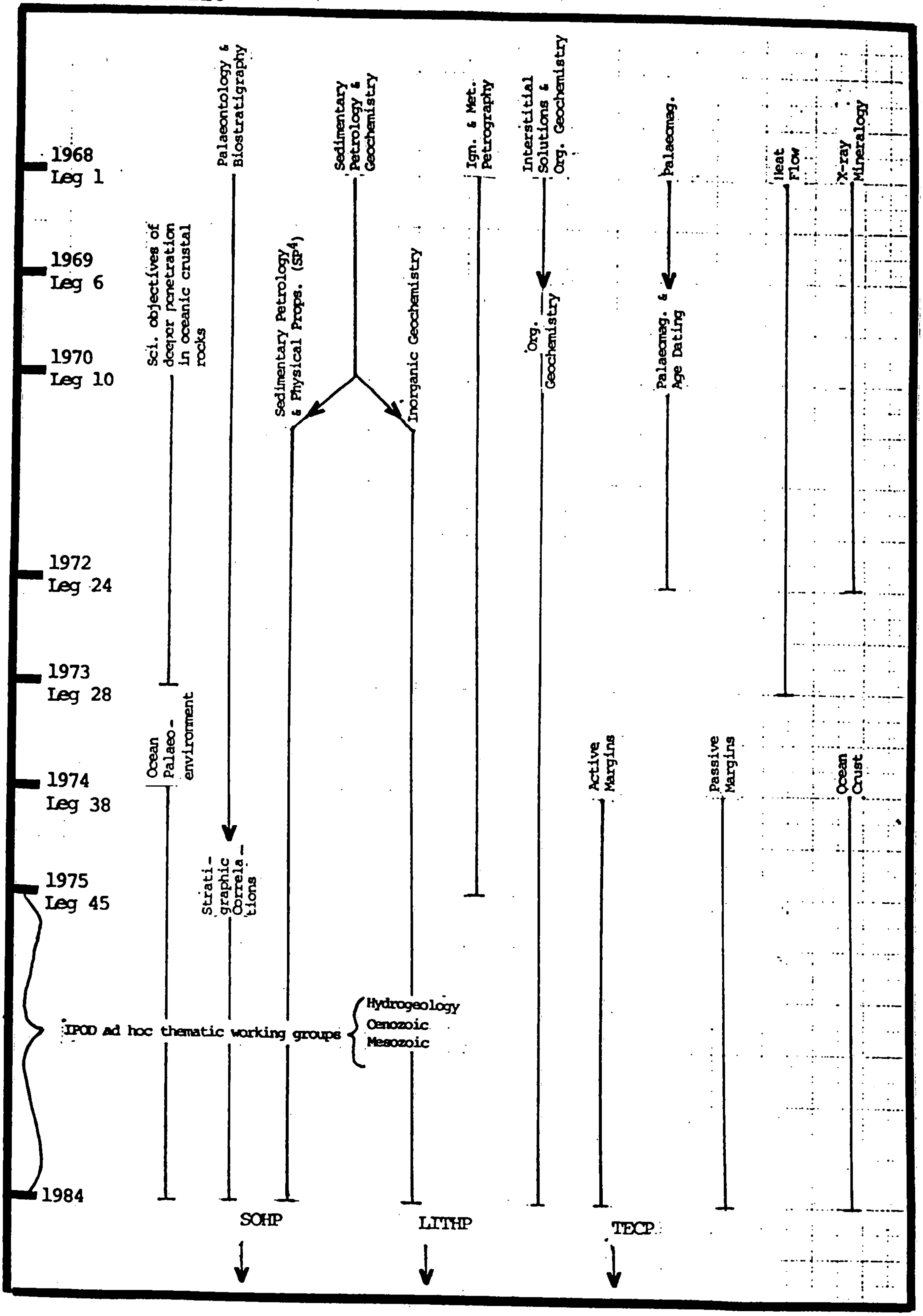
6. It was agreed that the present Science Advisory Structure should be reviewed at the Janaury 1986 meeting of PCOM.

AESM 12/85

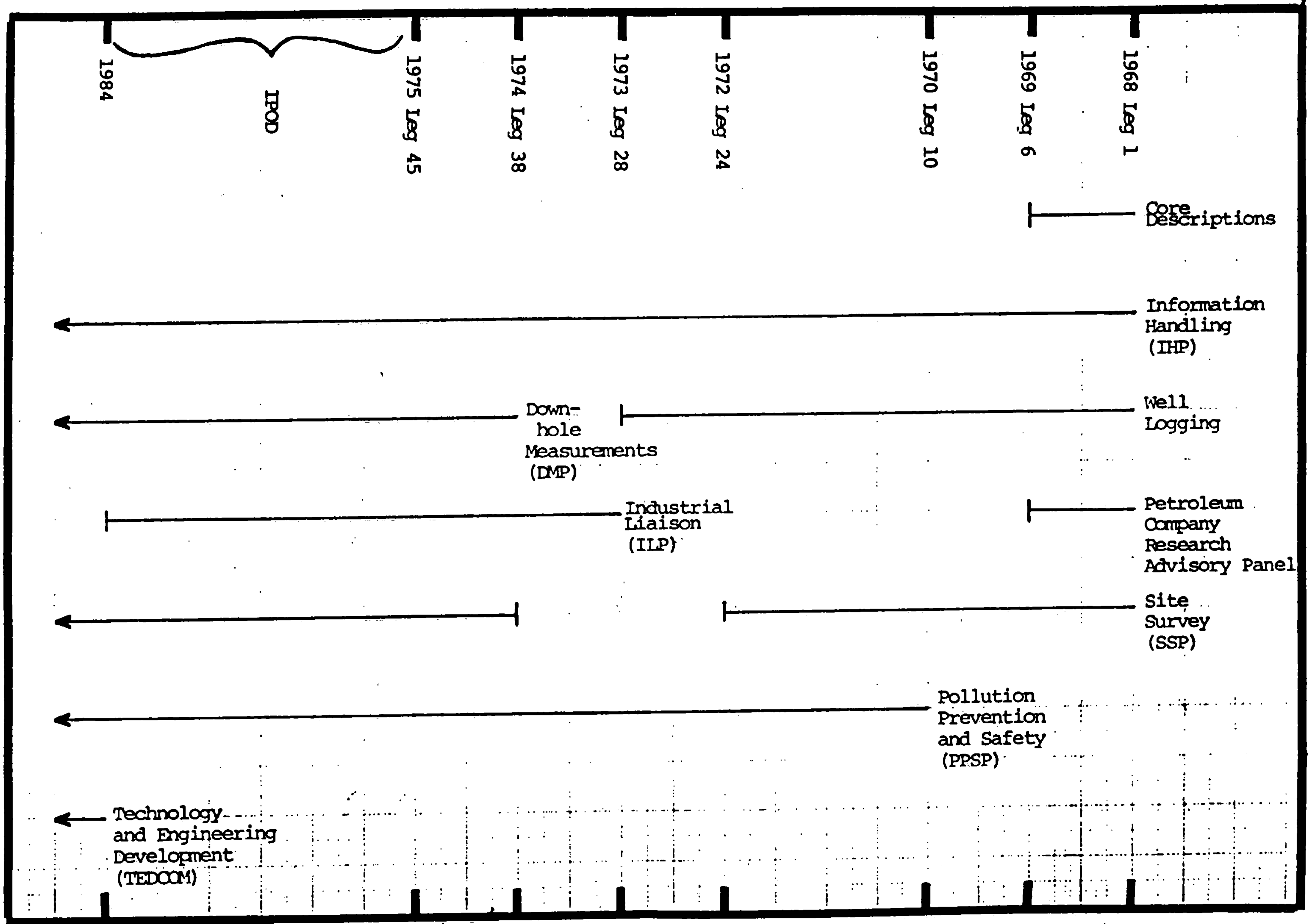
REGIONAL PANELS



THEMATIC PANELS



SERVICE PANELS



APPENDIX 7

EXCERPT FROM PCOM MINUTES FROM THE LA JOLLA MEETING IN JANUARY 1986

585 REVIEW OF JOIDES SCIENTIFIC ADVISORY STRUCTURE

The Planning Committee agreed that since the chairmen of the JOIDES Panels were in attendance at this meeting, it would be appropriate and very useful to discuss potential restructuring of the JOIDES panels.

Discussion of the present structure indicated that frustration with this system has resulted in the resignations of the LITHP chairman and the SOHP chairman. The frustration was based on a general feeling among LITHP and SOHP chairmen that there is an apparent lack of coordination between the panels, there is an unnecessary duplication of effort among the panels, there is a feeling that the advice of the thematic panels is largely ignored in favor of recommendations from the regional panels and that some disciplines within the geologic community (especially geochemistry) are not represented in the present structure and are being overlooked. Lastly, there was a general feeling of a majority of the chairmen that panel liaisons presently have too many meetings to attend and this system is not an effective means of communicating information.

It was suggested and agreed by both chairmen and PCOM that one of the main problems is one of communication between the panels and with PCOM. One possible solution was that an exchange of ideas between the panels occur at an annual meeting for panel chairmen and through joint panel meetings. These would provide chairmen with an opportunity to interact and develop drilling suggestions into a well defined and unified plan without duplicating ideas or objectives and to resolve differences between panels. Another suggestion was that the panel liaison system be improved to more effectively disseminate information among panels and PCOM. It was also recommended that the responsibilities of SOHP be broadened into a geochemistry panel, an ocean history-stratigraphy panel and a sedimentary processes panel in order to address the concerns of the geochemical and sedimentologic communities.

Discussion also indicated that most panel chairmen generally supported the present structure of thematic panels with support from regional panels. In addition, the group further emphasized that the drilling program should be driven by the thematic problems addressed by COSOD.

The consensus of PCOM was that it was premature to change the panel structure at this time although it was recognized that there have been difficulties, especially in terms of communications, between thematic and regional panels. In view of this situation a better inter-panel liaison network is required. One effective means of achieving this will be to establish a meeting of the panel chairmen, to be held during the summer (in addition to the annual meeting with PCOM). A second means is to have relevant panels hold overlapping meetings in order to resolve conflicts on priorities. The development of drilling plans should be based on an identification, by the thematic panels, of the global thematic objectives which may be best attained in any particular region. Regional panels should take these themes as the basis for regional drilling plans and there should be a further evaluation by the thematic panels. At this time the resolution of any conflicting advice from the regional and thematic panels should occur. The PCOM will then construct a drilling plan based on this flow of advice. PCOM further agreed that although the Program is placed within a 10 yr. framework, it should be emphasized that the boundary conditions are flexible. It was the general consensus that while thematic panels will continue to receive proposals, regional panels will concentrate on detailed proposal review in the development of the regional plans.

PCOM agreed that COSOD-2 may provide an opportunity for a review and possibly re-alignment of the panel structure. Meanwhile, PCOM will consider ways to best include the views of the geochemical community into the planning process.

The above consensus was achieved with the Panel chairmen and later confirmed by PCOM. M. Purdy (LITHP) requested that his disagreement with the above consensus of the PCOM be reflected in the minutes of the meeting.

APPENDIX 8

CHAPTER FROM LITHP MINUTES, 13-15 MAY 1987

7.3 Evaluation of ODP advisory structure

This provocative topic, suggested by the PCOM chairman, was briefly discussed, although the panel did not have time at the end of a long three day meeting to do the subject justice. There is, however, continuing frustration in LITHP that despite the changes that have been made over the past year, the program still has a regional focus that often serves as an impediment to achieving many of the global thematic drilling objectives outlined at COSOD. The controversy over reference holes and the exclusion of the Great Barrier Reef drilling from the core WPAC program approved by PCOM are only the latest symptoms of this problem.

The panel discussed several factors which may have contributed to this situation. One factor is the advisory panel structure itself in which the task of actually constructing a drilling prospectus or program is left to the regional panels. The role of thematic panels is purely advisory. Although it was noted that regional panels are composed of first-rate scientists who also are as interested in global problems as members of thematic panels, problems arise when regional and thematic objectives compete for the same limited amounts of drilling time.

A second problem may be PCOM itself. It was noted in the discussion that no effort is made to ensure that the PCOM membership has a necessary balance of expertise in the various key areas represented by the thematic panels. Decisions are too often made on the basis on incomplete or incorrect information provided by a liaison structure that has not worked well in the past. Suggestions were made to change the way PCOM membership is chosen, possibly having "thematic advocates" on PCOM, or having thematic panel chairman attend PCOM meetings (the last suggestion was vigorously opposed by the LITHP chairman!).

The main problem, however, may be how the long-term planning has been done in ODP and the circumnavigation philosophy that has driven the program in its first five years. This has led to totally arbitrary time blocks assigned to regional areas without consideration to global thematic drilling 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, liaisons etc. is going to change the regional focus of the program.

The most constructive suggestion to emerge from this discussion was that the long-term planning for the second five years of ODP be done in a different way. First, the idea, _a priori_, of a second circumnavigation, should be dropped. Each of the three thematic panels should be assigned the task of identifying a five year drilling program comprised of say 12 legs that would address the major global thematic drilling objectives outlined by COSOD I and II and these panels. In each case they would identify the key problems, 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 plan outlining approximately where the ship will go and how much time it will spend in each area. These plans would then be publicized and specific drilling proposals solicited. The regional panels would then take these proposals, and working within the thematic guidelines already developed, produce a detailed drilling program for their particular area. These plans would be reviewed by the thematic panels and PCOM to ensure they fulfill the original global drilling themes, but if the regional panels felt important regional problems had been overlooked, they could make a case for changes to the original plan.

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 a drillship. However, to us this is a far more logical way to plan a global drilling program than steaming around the world twice spending an arbitrarily assigned, equal number of legs in each major ocean basin!

Appendix 9

CHAPTER FROM TECP MINUTES, 27-29 APRIL 1987

12. OTHER BUSINESS

Nick Pisias asked for our assessment of how the panel structure is working, particularly with regard to the identification of thematic problems. Cowan and Hsü felt the system is fine. Westbrook favored appointing new chairmen from existing panel members so that some continuity can be maintained. He wondered why regional panels stay active after drilling in their region is complete. It was pointed out that the off-season affords a good opportunity for thinking about issues and formulating the most important ones, out of many possibilities, for future drilling.

Dalziel asked when the next meeting, beyond the September one, would likely be. Cowan said PCOM endorsed a two-per-year meeting schedule for panels. Because we need to meet a couple of months in advance of PCOM, early May would seem an appropriate time.

Cowan thanked Paul Robinson for his conscientious and very helpful service to TECP as liaison from PCOM.

The meeting adjourned at 12:05 p.m. on April 29.

CHAPTER FROM SOHP MINUTES, 31 AUG - 2 SEP 1987 (TOKYO) APPENDIX 10

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.

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BUNDESANSTALT FÜR
GEOWISSENSCHAFTEN UND ROHSTOFFE

FEDERAL INSTITUTE FOR GEOSCIENCES
AND NATURAL RESOURCES

Hannover, October 19, 1987

Ref.: B 2.33 - 222/04 - v.R./Pa
(Please include in reply)

APPENDIX 11

BUNDESANSTALT FÜR GEOWISSENSCHAFTEN UND ROHSTOFFE
Alfred-Bentz-Haus · Postfach 51 01 53 · 3000 Hannover 51

Dr. Timothy J.G. Francis
Institute of Oceanographic Sciences
Brook Road
Wormley, Godalming
Surrey GU8 5UB
ENGLAND

87-684

RECEIVED OCT 26 1987

Re: ODP Panel structure reform

Dear Tim,

may I give you as the European member of the panel structure ad-hoc committee, some ideas in which way I think that the present unsatisfactory panel structure should be changed. I have discussed these ideas (which are probably shared by most PCom members) with H. Dürbaum (our ExCom member) and H. Beiersdorf (the German ODP coordinator) which does, of course, not mean that they are shared by the whole German ODP community.

1. The thematic panels should be strengthened by a few key regional experts (from e.g. WPac) and data holders (e.g. a geophysicist with Pacific experience in SOHP).

2. One additional thematic panel might be necessary (e.g. diagenesis and organic/anorganic geochemistry taken out of the SOHP which seems too heterogeneous)

3. In special cases (e.g. Bering Sea, Gulf of California, EPR, margins around Japan) PCom could install short-lived regional working groups (with travel to be funded by JOIDES and partner countries). They should only meet once or a few times to coordinate regional proposals, and then be disbanded.

4. Regional panels should be disbanded:

a) IOP after drilling Leg 123 (about end of 1988)
b) WPAC after drilling WPac program (about end of 1990)
c) Atlantic Regional Panel immediately
d) CEPAC has probably to remain active until the Central and Eastern Pacific has been drilled (but without prioritization and only in the reduced manner as suggested by PCom in August). NB: This means more work for the thematic panels and less satisfactory work for the regional panels !

- 2 -

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5. In order to reduce manpower and travel money problem further reduce the number of meetings per year :

   a. all Service Panels (IHP, DMP, SSP, TedCom) only once a year
   b. WPAC and CEPAC no more than twice a year, ARP once a year (or disband)
   c. Thematic panels no more than twice a year.

I hope this will be of some help during your discussions.

Best regards,

Ulrich

(U. v. Rad)

cc: Dr. N. Pisias, JOIDES Office
    Dr. H. Beiersdorf
    Dr. H.-J. Dürbaum

ADVISORY STRUCTURE FOR ODP: COMMENTS AND A PROPOSAL

by Marcus Langseth

The letters and essays that have been contributed by panel members and participants in DSDP or ODP program are in agreement on one issue. **Planning for Ocean Drilling should be based on scientific themes.** That is, ODP should be focused on solving outstanding problems of Earth Science, as opposed to sampling the sea-floor sediments and crust in interesting areas to solve problems specific to that region. The problems should dictate the regions to be drilled. Regions should not dictate the problems.

Since everyone agrees that thematic planning is what is needed, the problem is essentially how to achieve that? In my view **thematic or problem oriented planning can only be done on a long term basis.** Major goals such as completing the sampling of the fossil and isotopic record in space and time, unraveling processes of subduction complexes in critical settings, and understanding the high temperature hydrothermal system at ridge axes require blocks of drilling time, specific complementary geophysical data and analyses and new engineering developments. **To address these themes adequately requires long range planning that sets goals and an itinerary for the drill ship.** The long range plan should be a framework that is a consensus of the scientists who are interested and committed enough to contribute to the planning process.

In retrospect the themes of the first five years of ODP were set by the long range itinerary (west to east circumnavigation of the RESOLUTION) modulated by the COSOD I document. That itinerary was set back in 1980, and although COSOD I provides general guidelines, it is not a plan. The present concerns about the advisory structure are **not** the result of a lack of inputs from the thematic panels, **nor** dominance of the planning process by the regional panels, but rather that the long term plan had already been set and both types of panels and PCOMM were competing to do the same job, i.e. short term planning of ODP.

A LONG RANGE PLANNING DOCUMENT:

The major improvement in planning that we need is to produce an adequate and detailed long range planning document. The elements of this document should include:

Definition of the specific scientific goals of the ODP program for the duration of the period covered by the document. For discussion purposes let's say six years.

A specific statement of where in the world oceans these problems can best be addressed, (which island arcs, which ridges, in which basins should sediments be sampled for paleooceanography studies).

This statement will serve as a basis for general six-year itineraries for the JOIDES RESOLUTION, that indicate the amount of time to be allocated to major objectives.

The document should describe the needs for further engineering or instrumentation development. The goals should be realistic ones that take into account the lead time required to produce the needed tools.

The document would outline the complementary geophysical and geological work that is needed to assure the drilling objectives are met.

This document must be produced by the JOIDES community of scientists. The exact forum requires discussion, but I envision a series of meetings that assembles a representative segment of the marine geoscience community. A series of three workshops, or one large workshop followed by working groups completing the planning document.

The workshops would provide a forum to receive proposals from the community. In fact one of the major activities at the initial workshop could be the presentation and discussion of proposals. The series of workshops would provide an opportunity to merge some of the proposals into a more effective drilling package. It would be possible to take proposals with exciting and original thematic objectives and change the location to optimize the logistics of the RESOLUTION's itinerary. In short the workshops would provide an opportunity for the kind of interaction between proposers and planners that is not being done currently.

Regardless of format the meetings should culminate in a long range planning document that is full of specifics as far as the problems to attack, areas to visit and experiments to do during the coming six years.

THE ODP LONG RANGE PLAN:

The Long Range Planning document would then be used by the Planning and Executive Committees to develop a single **ODP Long Range Plan (ODP/LRP)** for six years. The ODP/LRP would contain the same elements as above, but decisions would have to made as to the set of scientific objectives, the RESOLUTION's itinerary, and an indication of the specific instruments and tools to be developed based on time and budgets. A mechanism for community review of the six year plan would be required to make sure that the PCOMM/EXCOMM plan represents the consensus of the community.

The ODP/LRP would be working document, not the law. It would be essential to change it on some regular schedule in a non-disruptive way to respond to changing results, new scientific discoveries and new technical developments. A thorough review of the document that involved the community every two years would appropriate. The plan might be projected an additional 2 years at the same time.

STANDING PANELS:

Detailed planning for use of the RESOLUTION to meet scientific objectives identified in the ODP Long Range Plan would be the responsibility of PCOMM with advice from standing panels appointed by PCOMM/EXCOMM. The establishment, scheduling and membership of these panels should be geared to the ODP/LRP. The panels would be comprised of experts in the scientific objectives, regional experts and experimental expertise. These advisory panels would be neither thematic nor regional, but a mixture of both. Their task would be to recommend a detailed leg by leg prospectus to meet the goals of the ODP LRP. Their output would be submitted to PCOMM as recommendations for a short term (one year operational plan).

The technical and service panels would still be needed. I believe that their task would be much more clearly defined with a long range plan as a framework. Long lead time needs in geophysical surveying, instrument development, or engineering could be identified and recommended to PCOMM for implementation. These panels would also contribute to the implementation of the detailed plans. Stronger interaction between the technical panels and PCOMM is critically needed.

APPENDIX 13

G. Eglinton
P. Meyers
B. Simoneit

MOLECULAR STRATIGRAPHY: THE ORGANIC CARBON RECORD

Program

An integrated program focused on molecular stratigraphy should be instituted within the Ocean Drilling Program. This program would utilize the types and amounts of individual biogenic compounds as tracers of past oceanic processes. Prior results from the Deep Sea Drilling Project have demonstrated that biolipids, present in extractable or bound forms, survive in sediments and can indicate the origins of organic matter (i.e., the history of floral and faunal communities and abundances), transformation processes in the water column, and post depositional microbial alteration and subsequent diagenesis.

It is now timely to design a program to properly explore the molecular record preserved in deep sea sediments, collaborating with microbiologists, sedimentologists, inorganic geochemists, paleooceanographers, and bio- and isotope stratigraphers. The resulting information will elucidate the planktonic and microbial records present in the sea bottom.

The following facets of global environmental problems can be addressed with this approach:

1) Sea surface temperatures in comparison to $\delta^{18}O$ variations.
2) Upwelling histories and the record of ocean productivity.
3) Black shales, both in the deep sea, as links to Cretaceous seaways in Europe and North America, and as indicators of pre- and synrift oceans.
4) Continental vs marine organic matter and influence of Milankovitch cycles.
5) Geothermal history and fluid flows imprinted on organic matter, volatiles, and sulfur compounds.

Implementation

This program will require establishment of a group within the Ocean Drilling Program panel structure to oversee staffing of cruises with qualified personnel, coordination of shorebased analyses, sample selection and distribution, and dissemination of results. Samples must be selected on a rational, scientific basis and stored carefully to protect their ephemeral geochemical properties, usually by freezing. Routine analyses (e.g., organic carbon, Rock-Eval, $\delta^{13}C$, lipid gas chromatography and gas chromatography/mass spectrometry) should be made more automated and with improved data handling. Enhanced liaison with the petroleum industry expertise will be fostered.

Thematic Panel

A thematic panel on Molecular Stratigraphy: The Organic Carbon Record should be established. Its composition should include organic and inorganic geochemists, a microbiologist, a sedimentologist, and a paleooceanographer/isotope stratigrapher..

The aims of this panel will include:

1) Determination of the molecular sedimentary record at selected sites worldwide, linking it tightly to the classical stratigraphies, isotopic, bio-, etc., to provide the first assessment of the "missing" principal portion of the marine biological record - the non-mineralized, unicellular organisms. The organic debris in marine sediments comprising the bulk of the total organic carbon is believed to be largely microbial in character - a major component not recognizable by conventional micropaleontological methods but discernable by molecular techniques.
2) Determination of the diagenetic processes in selected sedimentary columns, for instance through dedicated drilling legs with sites chosen specifically to explore these processes. Detailed understanding of diagenetic alterations will be essential for proper interpretation of the organic matter sedimentary record.
3) Determination of the downward extent of the biosphere. Recent information has indicated the overprinting geochemical influence of microbial activity to considerable depths in the sedimentary column.

Drilling and Sampling

Samples are needed from contrasting environments spanning the depositional history of the oceans, covering:

1) high/low productivity areas, including oxic/anoxic water columns,
2) different types of sediments - clay, carbonate, and silica-rich,
3) high/low heat and fluid flows,
4) warm/cold surface waters.

Samples for molecular stratigraphy should be accompanied by complete sedimentological and biostratigraphic descriptions. This is best accomplished by selecting and freezing half-rounds of cores.

APPENDIX 14

Proposed Revision to PCHMN minutes:

Bottom p. 4, ~~after~~ after "Langmuir added LITHP's views."

He felt that the issues of long-term planning ~~and~~ in a proposal-driven system needed to be put into a clearer perspective. LITHP has been pushing consistently for long term thematic planning that would be able to encompass, for example, a ~~four~~ three leg - ~~four~~ two year program at the East Pacific Rise. It is not clear that such planning can be purely "proposal-driven." No one individual is capable of writing an EPR proposal. Furthermore, ~~a~~ although the system needs better proposals, there is very little motivation for a proponent. He must put in substantial effort into the proposal and follow-up documentation, but he gets no funding and ~~may even~~ has no assurance of being chief scientist. ~~If~~ The system is not structured ~~to ensure~~ so that excellent proposals will be submitted. So there is a conflict between the needs for long term planning and broadly based comprehensive proposals on the one hand, and on the other hand the lack of structural motivation ~~in~~ for the community ~~for writing~~ to write such proposals. For these reasons, perhaps there should be "oversight groups" responsible for carrying out long term thematic goals. These groups ~~would~~ might write comprehensive ~~prop~~ proposals, ~~and~~ oversee engineering and tool development, integrate site survey data from diverse fields, etc.

Charles Langmuir

REPORT OF ANNUAL PANEL CHAIRMEN'S MEETING

The Annual Panel Chairmen's Meeting was held on 29 November, 1987, in conjunction with the Annual Planning Committee meeting, at Sunriver, Oregon. The group focussed on JOIDES advisory panel structure, but also covered long-term planning, engineering developments, and Part B publications.

D.Cowan (Tectonics Panel) chaired the meeting and presented the results at the joint session with the Planning Committee. Highlights of Cowan's report and the meeting appear below.

JOIDES PANEL ADVISORY STRUCTURE

The Panel Chairmen's concerns on prospective changes to the advisory structure included the following:

* Does enough regional and thematic expertise exist on the panels to address global themes?

* Should major thematic panels be subdivided?

* What is the lifetime of a regional panel?

* How can panels handle the number of proposals in the system? Should deadlines for submission be established?

The Chairmen have recommended the following modifications to the panel advisory structure:

* The number and character of the present thematic panels should be retained.

* Thematic panels can form advisory bodies for specific tasks; these would report to the panels.

* Regional panels synthesize thematic priorities, mature proposals and logistical constraints into drilling prospectuses.

* Regional panels have a finite lifetime.

* Thematic panels should reflect a global distribution of regional expertise.

During the Chairmen's meeting, the dual role of the Downhole Measurement Panel (DMP) as a service and science development panel was discussed. It was noted that with its interest in global stress mapping and other themes, DMP has become thematic in scope. The consensus of the Chairmen was that, although DMP serves largely as a service panel, DMP also considers and promotes the science of downhole measurement.

Foremost of the Chairmen's concerns are the plans for the drillship after the program in the Pacific has been completed. Cowan said that COSOD II, workshops, thematic panels, and advisory groups will play a role in these plans, which must be advertised to the community as soon as possible.

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

University of Miami

January 19 - 20, 1988

EXECUTIVE SUMMARY

1. DMP is to assume the role of monitor of third-party development tools. Criteria are being developed for the acceptance of such tools as ODP mature tools operated by LDGO.

2. Panel received reports that the old Barnes/Uyeda temperature tool requires a data-quality evaluation retroactive over the first 17 legs of ODP. Exposed inadequacies in the data might have been noticed earlier if an ODP/TAMU staff scientist could have been dedicated to downhole measurements.

3. Panel perceived a need for core-barrel data on disc so that logs and core data can be displayed, overlain and thence integrated, on board ship. This would provide for a more effective data usage.

4. It is proposed to carry out logging-through-pipe experiments with nuclear spectral (geochemical) tools in the deep stratigraphic holes of Leg 123.

5. Panel response to WPAC proposals could not be finalized in the face of conflicting information. A subgroup of DMP will meet with WPAC around their next panel meeting to resolve.

6. DMP recommendations for the Engineering Test Leg encompass seven proposed experiments over a period of about seven days.

7. Panel expressed concern at processing bottlenecks on board ship which might impact adversely on formation microscanner data processing.

Paul Worthington

Paul F Worthington

19 February 1988

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

University of Miami

January 19 - 20, 1988

MINUTES

Present

Chairman:	P F Worthington (UK)
Members:	B Carson (USA) D Karig (USA) G Olhoeft (USA) R Porter (USA) C Sondergeld (USA) R Wilkens (USA) S Bell (Canada) H Kinoshita (Japan) A Kristensen (ESF) J-P Pozzi (France) H Villinger (FRG)
Liaisons:	R Anderson (LDGO) K Becker (LITHP) G Brass (PCOM) X Golovchenko (LDGO) M Langseth (PCOM) T Pyle (JOI) A Sutherland (NSF) E Taylor (ODP/TAMU)
Guest:	P Lysne (Representing R Traeger)
Apologies:	R Stephen (USA) R Traeger (USA)
Absent:	E Howell (USA)

1. **Welcome and Introductory Remarks**

The meeting was called to order at 8.34 am. The Chairman welcomed DMP Members, Liaisons and Guest, especially those members attending for the first time (Karig, Kristensen, Sondergeld and Wilkens). With the retirement of Matt Salisbury, Sebastian Bell is now the Canadian representative.

Review of Agenda and Revisions

As a consequence of Stephen's apology, item 5 is replaced by NSF and JOI reports from A Sutherland and T Pyle, respectively.

As a consequence of Hanel's non-attendance, item 6 is replaced by a LITHP report from K Becker.

[Both the deleted items will form part of the agenda for the next meeting.]

Under item 19 it is proposed to address the issues of TEDCOM liaison, letter to Co-chiefs explaining the scientific value of logging, and the reliability of geochemical logs, if these are not covered earlier.

Dan Karig distributed an unsolicited, unnumbered proposal on VSP measurements in the Nankai Trough by G F Moore. It is Panel policy not to consider unsolicited proposals. However, if time permits this will be discussed as an additional element of item 19.

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

2. **Minutes of Previous DMP Meeting, University of Washington, Seattle, August 18 - 19, 1987.**

These were adopted with the following modifications.

Page 3, paragraph 4(ii)

delete the sentence "Logging to be undertaken by Schlumberger."

Page 10, paragraph 10, line 8

sentence to read

"The commercial gyro used by the USGS which it was intended to purchase shows drift..."

Chairman signed the master copy for ODP records.

Matters Arising

Paragraph 3(i)

R Stephen's action on VSP to be reported at next meeting.

Paragraph 4(ii)

Chairman's action was delayed by earlier PCOM statement that requested guests for this meeting were not approved. It did not become clear until later that Dr Hanel of FRG was exempt from this statement. Invitation to Dr Hanel was delivered in December 1987 but no response was received. It is reported by FRG representative to DMP that the receipt of the invitation to attend January 1988 DMP meeting was too late to allow Dr Hanel to make his travel arrangements.

Paragraph 4(iii)

Chairman's letter to P Killeen not yet dispatched.

Paragraph 8

Chairman's action deferred pending further discussion at this meeting.

Paragraph 13

Anderson's action to mail revised logging programme for Leg 121 to DMP members not effected. Subject to be reviewed at this meeting.

3. Chairman's Review of Previous Year

The Chairman reviewed DMP's role in ODP, its mandate, and the philosophy governing Panel decisions, for the benefit of new Panel members.

Among the highlights of 1987 were:

- an improved rapport with TAMU engineers on engineering aspects of logging;
- a greater awareness of shipboard leaders that the downhole measurements programme must be respected;
- formulation of recommendations to upgrade the status of shipboard physical properties measurements;
- approval to commission ODP formation microscanner;
- COSOD II white paper on logging.

4. PCOM Report

Although there have been two PCOM meetings since the last DMP meeting, this report is concerned only with the most recent PCOM meeting in Sunriver, Oregon, in December 1987.

Langseth reviewed the programme changes in the WPAC plan and the status of CEPAC planning.

Langseth & Francis are accredited PCOM liaisons to TAMU engineers and to the principal investigators of 3rd party experiments.

TAMU and LDGO to set up wireline heave compensator test soon. PCOM encourages continued development of the French three-component sediment magnetometer. Time estimates for logging will be based on three-tool-string runs without the sidewell entry sub. PCOM backs the development of the slimhole formation microscanner.

DMP membership confirmed at 15.

Since the PCOM report was not in the requested format, the Chairman reviewed the PCOM response to specific DMP recommendations based on his perusal of the minutes of the last PCOM meeting. The Chairman's report is set out below in the format which Panel wishes to see as a standard component of PCOM reporting.

DMP Recommendation		PCOM Action/Response
1987/21	Physical Properties.	Referred to TAMU for comment in relation to ongoing plans and financial feasibility.
1987/22	Letter to Co-chiefs from PCOM chairman.	Accepted by PCOM chairman with modifications to be Leg-specific. Drafts to be prepared by DMP for perusal/signature by PCOM chairman.
1987/23	Tool developments.	PCOM accepted FMS as priority development.
1987/24	Hydrofraccing in hole AAP1B, Leg 123.	Approved.
1987/25	First FMS run to have dedicated scientist.	Not discussed by PCOM.

1987/26	Upcoming logging programme.	Used for PCOM information in formulating a Leg structure for WPAC. Further refinements needed by DMP in response.
1987/27	Panel membership: Wilkens, Karig et al. proposed.	Accept Wilkens, Karig to take Panel Membership to 15. PCOM define 15 as Panel complement.
1987/28	Date of current meeting.	Accepted.

[N.B. DMP Recommendation 1987/25 is now outstanding.]

5. NSF/JOI Reports

(i) NSF Report

Sutherland reported the ODP budget status as follows:

Total ODP budget for FY87	- $34 250 000
LDGO " " "	- $ 2 750 000
ODP budget increase for FY88	- $ 1 200 000
LDGO " " " "	- $ 30 000

It is probable that a 10% increase in the cost of membership will be requested from international partners from FY90.

Soviet Union still wishes to join ODP. Reports that they had been given the go-ahead following the recent summit are incorrect.

(ii) JOI Report

Pyle informed Panel that the budget target for ODP is $36 000 000 for FY89. A four year development programme has been proposed as follows:

FY88	$35 530 443	
FY89	$36 000 000	(increase 1.3%)
FY90	$38 000 000	(" 5.6%)
FY91	$39 000 000	(" 2.6%)
FY92	$40 000 000	(" 2.6%)

JOI and NSF representatives recently met with investigators at the Applied Physics Laboratory of Johns Hopkins University regarding their plan for an experiment in Hole 417 or 418. The project will include development of a wireline re-entry system by F Spiess of SIO as well as ocean-bottom siesmometer (Orcutt, SIO) and downhole seismometers (Stephen, WHOI). The work is planned for March/April 1989.

JOI is hiring an additional staff member specifically to deal with clearances, a problem area that is anticipated to become more difficult with time.

6. LITHP Report

Becker reported that LITHP last met 29/9/88 - 10/1/88 in Paris and will meet next 2/3/88 - 4/3/88 at HIG. At its last meeting, LITHP formulated its priorities for drilling in the central and eastern Pacific, and then met jointly with CEPAC. The top six LITHP themes and related proposals for central and eastern Pacific are:

Ranking	Theme	
1.	Structure of the lower oceanic crust - Return to 504B (proposal 286E)	(1-1.5 legs)
2.	Magmatic and hydrothermal processes at sediment-free ridges EPR (76E revised)	(3 legs)
3.	Magmatic and hydrothermal processes at sedimented ridges - Juan de Fuca (232E) Escanaba Trough (224E, 284E), Guaymas Basin (275E)	(1-2 legs)
4.	Early magmatic evolution of hot spot volcanoes - Loihi (282E) Marquesas (291E)	(1 leg)
5.	Crustal structure, magmatic evolution of ocean plateaus Ontong-Java Plateau (222E revised)	(1 leg)
6.	Composition and magnetization of old crust Jurassic Quiet Zone (285E)	(1 leg)

To help achieve these objectives, LITHP recommended:

1. Four hard-rock guidebases.

2. Engineering test leg to field-test hard rock drilling and coring systems before EPR. PCOM approved.

3. One leg young crustal drilling scheduled early in CEPAC.

4. PCOM establish a working group for EPR drilling, to develop detailed drilling plan, including logging, fluid sampling, geophysical expts., and long-term instrumentation. PCOM approved. Members: Davis, Baecker, Becker, Bryan, Cann, Detrick, Francheteau, Howard (TAMU), Macdonald, Mottle, Stephen. First meeting: 10/2/88 - 12/2/88.

At its next meeting, LITHP will doubtless be very pleased with the results of coring, logging, and downhole measurements during Leg 118 - yet another example of the strong collaboration of LITHP and DMP personnel and interests.

7. Monitoring of Third Party Specialist Tools

DMP have been asked by PCOM to provide information on the planned deployment of third party tools in ODP and to develop procedures for monitoring the development progress of these tools.

DMP Response

DMP recognises two types of tools:

Development Tools (instruments under development);
Mature Tools (established tools).

For a tool to be considered an ODP Development Tool and thereby scheduled for deployment several criteria should be satisfied.

(i) There must be an approved principal investigator.

(ii) The principal investigator should prepare a development plan for approval by LDGO (for wireline tools) or TAMU (for all others) and then by DMP.

(iii) The development plan should:

- provide evidence of the acceptance, desirability and usefulness of the measurements;

- identify development milestones;

- make provision for land testing;

- satisify safety considerations;

- specify shipboard requirements such as the data processing necessary to make the information accessible on board ship, any special facilities (emphasising areas where the tool is not compatible with existing hardware/software), and appropriate technical support.

- provide confirmation that the tool is intended to remain available for ODP use after development.

(iv) Where the development is funded by another agency (e.g. NSF) there must be agreement from that agency to transfer the tool to ODP if it is successful and if it is requested.

If DMP approve the proposal, the Panel will appoint a coordinator to monitor on behalf of the Panel the tool's progress through the development plan. The Panel monitor will receive reports from the Principal Investigator on request and will present these to DMP. DMP will review progress at regular intervals and will evaluate tool performance after each deployment. Day-to-day monitoring will be the responsibility of TAMU and LDGO. A tool cannot be regarded as an ODP Development Tool, and therefore cannot be scheduled for future legs, if it has not undergone the above procedure. All tools that are currently scheduled must have a development plan formulated as soon as possible. Once a tool has been accepted by DMP as a Development Tool the Principal Investigator will be required to co-sign the development plan with TAMU or LDGO as appropriate as a visible accedence to the provisions of the plan. A Development Tool cannot be deployed on an ODP leg unless TAMU/LDGO and DMP are fully satisfied that the terms of the development plan have been fully met.

For an ODP Development Tool to undergo the transition to an ODP Mature Tool, i.e. an established tool operated by TAMU or LDGO, there must be DMP approval. This approval will be given after Panel review of a proposal prepared by TAMU and/or LDGO and submitted to DMP. This proposal must satisfy DMP on the following counts:

- cost of routine operations including shipboard data processing
- requirements for routine operations/processing
- availability of spare components
- facilities for maintenance
- existence of an operating/maintenance manual
- safety considerations
- long-term usefulness of data
- established track record both in land tests and shipboard deployment.

Where several Development Tools are competing for the same Mature Tool slot, DMP will require the appropriate contractor to evaluate all the tools and submit their multiple-tool evaluations to DMP for Panel decision.

While PCOM are considering the above suggested procedures, two actions have been initiated to gather information on current tool developments in the ODP community.

Each Panel member to collate a list of known third-party tool developments, together with notes on problems and limitations, and forward these to the Chairman within one month.

[ACTION: ALL]

Science operator/logging contractor to prepare list of planned or proposed deployment of third-party tools in future legs.

[ACTION: TAYLOR/ANDERSON]

8. Logging Contractor's Report

Anderson reported that recent Legs 116 - 118 provided excellent examples of the contribution of logs to addressing scientific problems. Leg 117 provided the best logging return to date and was an exemplary case of Co-chiefs following the PCOM programme. In Leg 118 all logging objectives were achieved.

Leg 116 exposed inadequacies in the old Barnes/Uyeda temperature tool. Data from this tool are believed to be suspect. It is not known how long the tool has been malfunctioning. There is a need to evaluate the quality of temperature data from the first 17 legs of ODP. Chairman to inform ODP/TAMU Manager of Science Operations of this need.

[ACTION: WORTHINGTON]

This difficulty underlines the need for an ODP/TAMU in-house downhole measurement staff scientist.

DMP Recommendation 88/1

"ODP appoint a staff scientist with special responsibility for evaluating the performance and quality of those downhole measurements under TAMU control."

Other points covered by Anderson were:

(i) Bridges

The bridge problem has been diminishing since Leg 110 (e.g. only one bridge in five sites on Leg 117). Primary reason may be saline (29 000 ppm) mud often used by TAMU now. Sidewall entry sub used once on Leg 117. BRG is beginning its second analysis of logging success rate.

(ii) Bits

The TAMU lockable flapper worked in initial tests. This cheaper alternative to APC/XCB bit release permits more coring after logging. The hydraulic bit release continues to jeopardize logging of rotary-cored holes. Stuck core barrels continue: one lost APC hole and three lost XCB holes on Leg 117. Only two holes were lost to logging on Leg 117 because the engineers washed a third hole specifically to log it.

(iii) Software

BRG now has the CORPAC software package. This program yields a continuous correlation between logged sites, in spite of some lithologic change and substantial changes in sedimentation rate. CORPAC will be used on logs from 116, 117 and Prydz Bay.

(iv) Logging tool status

Many new Schlumberger tools were shipped for Leg 118, re-establishing complete backups. A pad-type neutron tool should have much better signal-to-noise ratio than the old tool. The magnetometer/susceptibilty tool from the University of Washington and a hybrid wireline packer were completed in time for Leg 118. A high-resolution temperature tool and French susceptometer will be available beginning on Leg 120. Consolidation from three to two Schlumberger tool strings may be possible in late 1988.

(v) High-resolution dipmeter

The FMS dipmeter can be ready 11 months after signing a contract. The cost is $160K; processing will be done in-house, with no charge for software. Ship heave probably will not degrade the <1 cm vertical resolution. The tool will be available for holes in which determination of any of the following is high priority: high resolution, sedimentary facies, structural dip, stress direction, or imaging of fractures, contacts, and pore geometry. Logging speed is fast.

(vi) Reduction to two standard tool strings

Problems are the LDT and the fact that no porosity can be measured using the Cf source in the AACT. These issues continue to be addressed by LDGO.

9. Budget Status

Anderson reported that the LDGO total budget plan, with Schlumberger charges in parentheses, for FY 87 - 92 is:

FY87	$ 2 750 000	(1 510 004)
FY88	$ 2 781 946	(1 590 246)
FY89	$ 3 057 902	(1 677 088)
FY90	$ 3 157 511	(1 790 242)
FY91	$ 3 361 392	(1 878 330)
FY92	$ 3 349 153	(1 989 797)

Much of the LDGO increases are taken up with Schlumberger inflationary adjustments.

Permanent equipment proposals are:

FY88	$ 104 000	FMS + ancillaries
FY89	$ 215 000	FMS, gyro, 3rd packer, packer improvements, computer upgrades.
FY90	$ 150 000	I.P., digital BHTV
FY91	$ 250 000	Lease of high temperature logging tools ($60K/Leg)
FY92	$ 80 000	Lease of high temperature logging tools, computer upgrades.

This LDGO budget proposal is in excess of JOI guidelines and will almost certainly be cut. The budget conforms to DMP priorities established in April 1987.

10. Scientific Value of Logging

Discussion of how to demonstrate the scientific benefits of logging to the earth science community furnished several interesting suggestions.

(i) Shipboard interaction and cooperation

There is a need for core barrel data on disc so that logs and core data can be displayed, overlain and thence integrated. This would provide for a greater visible use of logs during cruises.

DMP Recommendation 88/2

"ODP/TAMU and LDGO develop a display-capable core data base to automate the production of barrel sheets and to facilitate the integration of log and core data on board ship."

(ii) Post-cruise data access

Panel encourages the establishment of an ODP logging data bank in each member country and each JOIDES institution. Panel encourages the acquisition of Terralog at scientific rates by these countries/institutions. The possibility of a Terralog licence for the ODP community to be explored.

[ACTION: ANDERSON]

(iii) Keynote paper

The unabridged COSOD II white paper should be submitted for publication as soon as possible. Targeted journal is Earth Science Reviews (Elsevier).

[ACTION: WORTHINGTON]

LDGO will reprint and provide suitable covers after publication. Paper to be distributed thoughout ODP community.

[ACTION: ANDERSON]

(iv) Logging schools

Schools should be organised in U.S.A. JOI-USSAC to discuss proposal at their meeting immediately following DMP meeting. Possibilities are to arrange a time/venue close to GSA or AGU meetings.

(v) Panel membership

Ties with LITHP are strong largely because of Keir Becker's liaison role. There are no liaisons with SOHP and TECP. Rather than appoint liaisons from DMP, steps should be taken to ensure that one member of each of these thematic panels has downhole measurements expertise. This strategy has evidently been successful in the case of LITHP.

DMP Recommendation 88/3

"Future vacancies on SOHP and TECP be filled with priority given to at least one member on each panel having downhole measurement expertise."

(vi) Keynote presentations

Investigate the possibility of a special session on ODP downhole measurements at December 1988 AGU meeting.

Investigate the possibility of a keynote paper on downhole geochemistry at International Geological Congress in August 1989 - contact Bruce Hanshaw.

[ACTION: PYLE]

(vii) AGU thematic volume

Investigate the possibility of a special issue of JGR with an ocean crust theme. JGR editor to be approached.

[ACTION: BECKER]

(viii) Shipboard presentations

LDGO/JOIDES logging scientists to give a keynote presentation at the start of each ODP leg, to inform cruise members of the scientific benefits of logging both in general and in the context of the leg in question.

[ACTION: ANDERSON]

(ix) Video

Upcoming keynote presentation by the Chairman on "Geological information from downhole measurements" at the four-yearly meeting of the British Geological Societies in September 1988 will be videoed for viewing by DMP members and LDGO staff. If deemed suitable the video could be made available on board ship.

[ACTION: WORTHINGTON]

(x) Preliminary leg reports

The blue-covered preliminary report for Leg 117 contained a logging report for the first time. DMP expects this practice to continue. This will give logging a more immediate visibility.

11. Technical Review - Logging Through Pipe

Pursuant upon DMP recommendation 1987/5, that provision should be made for an evaluation of the feasibility of logging through pipe, PCOM have requested information on the types of sites where these experiments are best carried out.

In reviewing the subject Anderson identified the requirements of a through-pipe experiment. This would entail the three logging tools that comprise the geochemical tool string, NGT, AACT and GST. For adequate statistics there would need to be two passes inside the pipe and two outside. Since two of the three tools are activation tools, there is a need for a gap of several hours between passes. The chosen site must offer 400 - 500m of hole which would entail 24 hours logging plus one pipe trip (1.5 days in all). The test site must show lithological variatons but there should be no carbonates. The deep stratigraphic holes of Leg 123 are ideal. There will hopefully be a further opportunity to test the geochemical tools during the engineering Leg (125).

Although not tested previously in ODP, limited through-pipe logging has been undertaken occasionally. For example, the reliability of through-pipe spectral gamma logs was confirmed on Leg 117, for slow logging speeds.

DMP Response

DMP accepted the position outlined by the logging contractor and look forward to the Leg 123 results.

12. Upcoming Legs - General Overview

Taylor and Golovchenko outlined upcoming programme schedules.

(i) Leg 120: Scheduled logging is standard suite + VSP. VSP (Woods Hole) might not be ready in time having been used on Leg 118 and requiring checking at base.

PCOM have asked for the French susceptibility tool to be run on this leg.

LDGO is not responsible for travel costs of technicians to run third party tools.

(ii) Leg 121: Standard suite + BHTV to be run uphole for as long as useful data are being recorded.

DMP Recommendation 88/4

"For Leg 121 holes NNER-9, NNER-10, 90ER-2, it is recommended that borehole televiewer be deployed in basement and over limited section in sediment for as long as data remain useful."

DMP noted that BHTV deployment time would be 7 - 8 hours per hole. Priorities for deployment were assigned as follows.

1 90ER-2
2 NNER-9
3 NNER-10

There is a dearth of stress information in this region and all holes are therefore considered important.

(iii) Leg 122: Standard logging suite.

(iv) Leg 123: Standard logging

Site AAP1B: also BHTV
magnetometer/susceptibility
VSP
hydrofraccing

BHTV to be run in basement and also in sediments for as long as useful.

Magnetometer/susceptibility tool in basement only. VSP needs a stabilised drillstring: this needs a separate pipe trip. This increases estimated VSP time.

Revised estimate:	Standard logging	1.9 days
	BHTV + mag./susc.	0.9 days
	VSP	2.0 days

DMP Recommendation 88/5

"A packer/hydrofrac scientist should be included as a member of the shipboard party for Leg 123."

JOIDES logging scientists have already been identified up to Leg 123.

13. Logging Plan - Western Pacific

Taylor and Golovchenko presented Panel with the revised WPAC Leg schedule as approved by PCOM and asked DMP to approve a logging programme. After much discussion, which exposed conflicting hole specifications, dearth of information on new sites, and irreconcilable estimates of logging times from unknown sources, Panel decided it could not proceed with this agenda item.

DMP Recommendation 88/6

"DMP response to Western Pacific schedule cannot be finalized in the face of conflicting information. Two nominated DMP members to meet with WPAC around next WPAC meeting to merge logging requirements with WPAC proposals."

Nominated DMP members are WORTHINGTON and VILLINGER.

14. Logging Plan - Central and Eastern Pacific

Agenda item deferred.

15. Geoprops Probe

Karig reviewed progress of the feasibility study which is due for completion by the end of January 1988. A proposal to build will be submitted in early February, cost c. $ 150 000 for one tool plus spares, with development by TAM Inc. If funding approval is forthcoming quickly, the tool could be ready for the Nankai Leg (128). This leg would be greatly enhanced by the Geoprops Probe but the success of the Leg is not dependent on the tool being deployed. Geoprops Probe is not intended for use until sediment becomes too stiff for new Barnes/Uyeda tool: it could also be used in basement.

PCOM have requested specifications for a test hole for the Geoprops Probe.

DMP Response

There are only two specifications for a Geoprops Probe test hole:

(1) It must be a Navidrill hole

(2) There must be consolidated sediments.

16. Engineering Test Leg

PCOM have requested DMP recommendations on development tests in Leg 125.

DMP Response

Current requirements for engineering leg are:

1. Wireline Packer (2 days)

   A key issue is whether the packs can be closed sufficiently after each inflation.

2. Wireline Heave Compensator (1 day)

   This has not yet been run with a dedicated accelerometer. We still don't know how efficiently it is working.

3. Formation Microscanner (1 day)

   Need to test whether tool opens/closes correctly and can pass out of and into the drill bit.

4. GST Through-Wiring (1 day)

   This test is crucial to reducing the current standard Schlumberger tool strings from three to two. This encompasses through-pipe logging based on success of tests during Leg 123.

Items 1 - 4 will be the subject of land-testing before Leg 125.

5. Geoprops Probe (0.5 days)

   If tool is not ready a dummy will be tested to see if it functions correctly. Time estimate presumes that Navidrill will be tested anyway.

6. ODP Rotatable Packer (1.5 days)

   This is used as a packer where there is danger to the non-rotatable straddle packer. Time estimate includes pipe trip.

7. Side Entry Sub

   Fast assembly mode SES: test circulation capability (for very high temperature environments).

17. Proposals

(i) Proposal 155F revised.

JOIDES Resolution to emplace seismometer downhole during Leg 129 or 130, to be left for about 1 year, then recovered. Time provision already made by PCOM for Leg 130.

DMP Response

Panel endorses proposal and looks forward to further developments. A more detailed plan is requested for next DMP meeting.

(ii) Proposal 66F

Panel's key problem was a lack of knowledge of what the proposer is assuming about the availability of a core orientation facility. Panel asked whether televiewer orientation would suffice. Panel to correspond with proposer on orientation issues.

[ACTION: KARIG]

(iii) Proposal 76E revised

Panel questioned the realism of the high-temperature tools suggested by the proposer. Proposal tabled until the next meeting pending the review of third party tools. It was noted that an EPR working group had been established and that this proposal would fall within their remit.

(iv) General

Panel commented on the poor quality of ODP proposals which often contain too little detail to allow a useful appraisal to be made.

18. Next meeting

Panel noted a need for discussions with TAMU Engineers on a range of subjects.

DMP Recommendation 88/7

"JOIDES Downhole Measurements Panel to meet in College Station, Texas, on 9 - 10 June 1988."

[If agenda is substantial, provision will be made for extending the meeting until noon on 11 June 1988. If this extension is deemed necessary a decision will be notified two months prior to the meeting.]

19. Other business

(i) TEDCOM Liaison

Chairman has been appointed DMP liaison to TEDCOM continuing the tradition of his predecessor. Chairman will attend next TEDCOM meeting (Houston, 4-5 February 1988) and will report back to DMP in June.

[ACTION: WORTHINGTON]

(ii) Letter to Co-Chiefs

PCOM Chairman has agreed to forward a letter to Co-chiefs explaining scientific value of logging. However, rather than use a single general letter, he prefers one which is specific to the particular leg. It was agreed to draft a two-paragraph letter, the first paragraph dealing with generalities, the second with Leg-specifics, for forwarding by PCOM Chairman to the Co-chiefs of Leg 122: this process to be repeated for subsequent legs.

[ACTION: WORTHINGTON/ANDERSON]

(iii) Reliability of Geochemical Logs

Anderson outlined the studies that are in the pipeline. These involve logs from the Cajon Pass well, holes in the Palisades Sill basalts, and Leg 111 (hole 504B).

In particular, the Cajon Pass study is based on averaging core material and logs over a 20m interval. Schlumberger software is used for log interpretation with no input from core. Mismatches are likely to reflect calibration errors in Schlumberger software. The corrections for bad hole are not functioning well: in rugose holes we seem to be seeing more standoff than is corrected for. Logging problems are the absence of a boron sleeve to overcome the borehole effect and no dual passes to enhance statistics.

(iv) VAX Space on JOIDES Resolution

Anderson pointed out that DMP is on record prohibiting the transmission of logging data ashore for processing and subsequent retransmission to ship. FMS will cause problems because there is insufficient VAX space for shipboard processing of FMS data. The only two choices are to transmit the FMS data ashore or to load processing software on the VAX and process shipboard.

Another area requiring additional computer time is the integration of shipboard core and log data.

Panel requested information as to what exactly is full, i.e. is VAX cpu time full or is the memory inadequate.

DMP Recommendation 88/8

"TAMU be asked to report to next DMP meeting on reasons for the processing bottlenecks on board ship together with their proposed solutions."

(v) High Technology Developments

Brass observed that hitherto ODP had adopted industry tools. The time might now be right for tool developments beyond the current status in industry, e.g. fibre-optic cable, germanium crystals, titanium tools up to 400°C. Panel applauded this view but noted the tightness of budgets which might preclude such ambitious ventures.

(vi) Unsolicited Proposal - G F Moore

Deferred.

20. Close of Meeting

Meeting closed at 1500 hours on Wednesday 20 January 1988.

Paul F Worthington

Downhole Measurements for WPAC Programs
2/10/88

(R.Jarrard)

WPAC has informally requested details of DMP recommendations for WPAC programs. They already have considered Nov. 1986 DMP recommendations in their leg plans (WPAC Third Prospectus), but this was done without having many details on why the DMP recommendations were made. The WPAC logging plans differ from 11/86 DMP recommendations in many respects. Further, DMP revised their recommendations in August 1987 and both sites and site objectives are still changing. At the next WPAC meeting (April 1988), WPAC intends to develop a moderately firm drilling and logging program for the Western Pacific.

This document is a straw-man rationale for WPAC logging. It represents my interpretation of DMP recommendations, spotlighting areas of disagreement between DMP and WPAC and areas where new information requires reconsideration. For example, WPAC did not know about the FMS Formation MicroScanner when their Third Prospectus was prepared. DMP assumed that the FMS would be a standard log, but PCOM made it a specialty tool to be used only when important enought to justify the extra logging time. In the accompanying logging plans table, the logging runs needing most reconsideration are indicated by "yes", "?", and "<u>no</u>". These three flags represent my guesses concerning whether the logging run will ultimately be recommended ("yes") or rejected ("no"), or the outcome is uncertain ("?"). These flags are included only to assist in assessing the impact of decisions on total logging time. The JOIDES panels, <u>not</u> the wireline contractor, decide whether or not a logging run should be scheduled.

Several assumptions are made in calculating logging times:

1) "standard" logging is assumed to require only two tool strings after the first leg of the WPAC program (WPAC assumed 3 standard strings and no FMS, but we assume that 2 standard strings plus the FMS take about the same time).
2) estimated times do not include contingencies or unusual measures to increase the probability of logging success. Such measures could include using the sidewall entry sub, washing a hole for logging, or alternately drilling and logging in the same hole. If bridges are encountered, the time used to deal with the bridges would reduce the number of tool strings run.
3) the televiewer is <u>not</u> assumed to be combinable with the magnetometer/susceptometer, forming a single hard-rock tool string. Such a combination is dependent on L-DGO funding constraints and DMP/PCOM/JOI priorities. The impact of combinability would be a total savings of about 3 days during WPAC, and acquisition of both televiewer and magnetometer data from holes in which only one tool is now scheduled.
4) when a reentry cone is scheduled, 0.7-1.3 extra days are scheduled for a pipe trip (instead of dropping the bit at the bottom of the hole), to permit possible deepening of the hole on a future leg. However, this pipe trip may be fruitless, because uncased sediments probably will prevent reentry into the basement portion of an old hole. This pipe trip is needed if a packer is scheduled. Dropping the bit instead of tripping pipe could save a total of 0.6-2.7 WPAC days (BON6, J1b, J2a,LG1), depending on how many reentry holes have packer tests scheduled.
5) wireline packer use is assumed to involve only one tool trip and two

water samples.

6) BHTV logging is assumed to stop 50-100m above basement.

PCOM (11/87) asked DMP for: (1) an updated logging program for Bonin/Mariana and Bonin; (2) response to their recommendation to add 11 days to Japan Sea II for downhole experiments; and (3) details on the geoprops probe. To date, DMP has only responded to the third request. In addition, two WPAC programs have not been considered by DMP: S. China Margin and Geochemical Reference Sites.

Banda-Sulu-SCS

Three sites will be drilled as the first leg of WPAC drilling. The remaining three sites may be drilled in the second year of WPAC drilling.

Standard Logs

Goals: 1) mineralogy for deciphering evolution of surrounding regions and for paleoceanography; 2) interbasin correlation of stratigraphic histories; 3) seismic stratigraphy.

Comments: a principal goal of all sites is basement dating, not addressable by logs.

DMP/WPAC compromise: both agree on logging all sites except SCS5 (200 m penetration). DMP has seen no information on Celebes site, but objectives are similar to other sites.

Formation MicroScanner(FMS)

Goals: 1) high-resolution paleoceanography in laminated anoxic sediments of SUL-5; 2) sedimentary facies determination in basal sand-silt-clay of SUL-5; 3) stress direction from breakouts (in basement or lower lithified sediments such as SUL-5); 4) structural dip?

Comments:

1) this leg is the earliest possible leg for FMS deployment, and the tool probably will not be ready to test until the following leg (engineering test leg). Except at SUL-5, most FMS capabilities (structural dip, high resolution, sedimentary facies, and fracture determination) may not be needed; breakout directions would be quite useful but stress measurement is neither part of cruise objectives nor reliably feasible except in basement;
2) FMS useful at SUL-5.

Magnetometer and televiewer

Goals: 1) imaging of basement contact; 2) flow and fracture delineation; 3) paleomagnetic detection of basin rotation (assuming little viscous magnetization and that gyro orientation is available), 4) stress direction from basement breakouts.

DMP/WPAC compromise: DMP recommended magnetometer and televiewer at BNDA-2 and televiewer at SUL-5, but WPAC recommended neither.

Bonin/Marianas

Standard logging
Goals:
1) interwell correlation (for differential sedimentation history of BON1 graben vs. BON2 horst; for composite section of BON5A and adjacent submarine canyon site BON5B; for comparison of forearc basin sites BON5A and BON5B with outer arc high site BON6);
2) seismic stratigraphy of forearc (BON5A, BON5B, BON6);
3) porosity for decompaction backstripping [BON5A, BON5B, BON6, BON1(?), BON2(?)];
4) geochemistry (BON1, BON2, MAR3, MAR3A, BON7);
5) temperature and thermal conductivity, for hydrothermal circulation (BON1, BON2, BON7, MAR3(?), MAR3A).

FMS
Goals:
1) structural dip for tilting associated with active rifting at BON1 and BON2; tilting of BON5A, BON5B, and BON6 associated with forearc flexural history; possible tilting at MAR3 associated with intrusion of MAR3A diapir;
2) fracture pattern and orientation, flow, foliation, wall-rock entrainment and possible brecciation within forearc serpentine (?) diapirs at MAR3A and BON7;
3) core orientation in dipping units at BON1, BON2, BON5A, BON5B, and BON6, for paleomagnetic study of local block motions and of Philippine plate;
4) breakouts for stress direction?
5) depositional environment at BON5A, BON5B, and BON6.
Comments:
1) BHTV might be more effective for goal #2, depending on whether resistivity or impedance has more character in these hard rocks, but BHTV much slower than FMS;
2) objective #3 feasible when dips are $>5^{0}$.

Televiewer
Goals: see FMS
DMP/WPAC compromise: DMP recommended televiewer at BON6 (outer-arc high with 150 m basement penetration), but WPAC had no televiewer recommendations. Other very deep basement penetrations on these legs include MAR3A diapir (<600 m), MAR3 diapir flank (unknown m), BON7 diapir (unknown m) and BON2 rift-flanking horst (200 m). Will televiewer contribute enough beyond FMS to justify it in an already tight leg?

Wireline packer
Goal: pore fluid sampling for chemistry of hydrothermal circulation (possible Kuroko-type sulfides at BON1 and BON2; unknown provenance of fluids at diapir sites BON7 and MAR3A).
DMP/WPAC compromise: DMP recommended wireline packer at MAR3 (before possibly better site MAR3A was scheduled), BON6, BON7, BON5A, and BON5B. WPAC fluid circulation goals are BON1, BON2, BON7, and MAR3A, but WPAC has not recommended any wireline packer use. Interstitial water samples can only be obtained from sediments (BON1 and BON2), so wireline packer appears to be the only possibility of achieving the WPAC objective of water geochemistry

at diapir sites BON7 and MAR3A. Chance of tool success in the diapirs is unpredictable, because of unknown permeability.

Packer:
Goals:
1) permeability of upper levels of basement in old forearc crust (BON6);
2) permeability of young back-arc crust, where hydrothermal circulation may be active (BON2).
Comments: requires reentry cone, but one may not be scheduled at BON2.
DMP/WPAC compromise: not considered yet by either panel.

Magnetometer/susceptibility
Goals:
1) Magnetic properties of rift-related (BON1 and BON2) and forearc (BON5B, BON6) volcanics and of forearc diapirs (BON7 and MAR3A);
2) palomagnetic study of motions of local blocks and the Philippine plate (if volcanics are not dominated by viscous magnetization and if gyro orientation is available).
Comments: These goals could also be addressed with cores if FMS or BHTV core orienting is obtained.
DMP/WPAC compromise: DMP recommended magnetometer and susceptometer at BON6, but WPAC did not recommend these tools at any site. If time constraints force a choice between wireline packer, televiewer, and magnetometer/ susceptibility, then wireline packer is probably most critical to cruise objectives.

Induced Polarization
Goal: detection of extent of possible Kuroko-type massive sulfides at BON1 and BON2.
Comments: not previously considered, because WPAC did not know about I.P. capabilities and DMP did not know about possible sulfides at these sites.
DMP/WPAC compromise: not recommended by DMP or WPAC. Should the tool be available in case massive sulfides are encountered in the cores at these or other sites?

Nankai

The logging rationale for this leg is discussed in detail in the WPAC prospectus. Here the focus is on contributions of specific tools. The importance of logging on this leg, as well as the amount of time committed to logging, may justify committing some time to increasing the probability of logging success (e.g. washing a hole for logging).

DMP reconsideration needed on relative logging effort at NKT-1 and NKT-2. WPAC scheduled 5 days (plus 2 days special experiments) and 10 days (plus 3 days special experiments), respectively. Nearly all experiments at NKT-2 require "control" experiments at the reference site; possible exceptions are BHTV, dual laterolog, and quantity of measurements for packer, wireline packer, VSP, and (if routine rather than test) geoprops probe.

Here we assume only one Nankai leg. However, WPAC and PCOM still tentatively carry a Nankai Geotechnical leg in their schedule, pending information from DMP on the feasibility and timing of development of the Geoprops Probe.

<u>Standard logs</u>
Goals: porosity (intergranular plus fracture); temperature; mineralogy (esp. clay content and type); velocity (but not anisotropy); thermal conductivity.

<u>FMS</u>
Goals: density, distribution, and orientation of fractures; structural dip variations; high-resolution porosity variation (separate intergranular and fractures); core orientation for lab measurements of anisotropy; stress breakouts; slump detection.

<u>Televiewer</u>
Goals: similar to FMS.
Comments: the televiewer is much slower than the FMS and may not image bedding as well as the FMS (especially if hole diameter is large in the upper portion) but it has the advantage of a 360 picture. DMP (11/86) recommended televiewer in only the bottom 100 m of each hole. Is televiewer still considered to be valuable, and if so, how much hole should be logged?

<u>Multichannel sonic</u>
Goals: compressional and shear wave velocity, attenuation, elastic moduli (e.g. rigidity modulus).
Comments: the 12-channel tool may not be superior enough to the Schlumberger 8-channel sonic to justify the logging time. Shear wave velocities can be directly determined only for the lower portion of each hole, yet S-wave velocities are essential for determining elastic moduli. This leg would benefit greatly from the conversion of an MCS tool to shear source (possible but uncertain without JOI funding).

<u>Vertical seismic profile</u>
Goals: 1) detailed seismic/depth tie (more reliable than from sonic log because of probable high lateral variability of velocities); 2) imaging of

horizons below the bottom of the hole; 3) stress direction from tube-wave anisotropy.
Comments: DMP recommended an oblique seismic experiment. Time needed? Is there a ship available? Can a combined temperature/seismometer array be deployed for a later o.s.e.?

Dual laterolog
Goals:
1) relative importance of "vertical" and "horizontal" fractures;
2) larger-scale (more representative) porosity than is obtainable from other tools.

Packer/wireline packer/Barnes sampler
Goals: 1) pore fluid sampling (wireline packer and Barnes/Uyeda) for fluid geochemistry; 2) permeability (packer); 3) pore pressure (packer and wireline packer); 4) heat flow (Barnes/Uyeda).
DMP/WPAC compromise:
1) both DMP and WPAC recommended wireline packer, but only WPAC recommended packer and Barnes/Uyeda sampler. How many measurements and how much time are appropriate for each? To what extent should these measurements be made at the reference hole (NKT-1)? Packer at the reference hole would require a reentry cone (opening the possibility of XCB instead of RCB there, for better core recovery and for core physical properties less ambiguously comparable to the mainly XCB hole NKT-2).

Long-term Temperature Monitoring (NKT-2)
Goals: 1) temporal changes in fluid flow; 2) equilibrium temperature profile and fluid flow.
Comments: 1) how long would deployment take? 2) DMP concern that these tools in hole might preclude future re-entries (nonretrievable tools because hole will close up with time; washing a new sediment hole is not much slower than cleaning out an old one); 3) would a bridged hole ever be representative of in situ fluid flow conditions?

Geoprops Probe
DMP/WPAC/PCOM compromise:
1) DMP recommended tool use at both NKT-1 and NKT-2, but NKT-1 is now an RCB hole, not XCB (probe only works with XCB);
2) WPAC recommended tool testing on this leg, with subsequent decision on value of Nankai geotechnical leg;
3) PCOM charged DMP with providing information on the tool.

Japan Sea I and II

Standard logging

Goals:

1) seismic stratigraphy;
2) mineralogy for paleoceanography and paleoclimate;
3) porosity for decompaction and subsidence history;
4) temperature and thermal conductivity from logs for heat generation in the sedimentary column.

Comments:

1) J1d only 380 m penetration; both DMP and WPAC recommended logging.
2) all sites try to avoid the shallow gas problem, but even slight gas will disturb core and give unreliable phys. props., making goals 1-3 less feasible from cores than usual.

FMS:

Goals: every FMS capability except possibly fracturing and faulting is important at some site and useful at nearly every site.

In particular:

1) structural dip for obduction at J3a, rift-related tilting at J2a;
2) oriented core via dip direction of tilted sediments at several sites, for paleomagnetic studies of the rotational history of the region;
3) slump (esp. J2a and JS-2) and turbidite detection, because of their effects on paleoceanographic and paleodepth indicators;
4) stress directions from breakouts, at J1d and J3a because of incipient plate boundary obduction, at other sites complementing the best-documented stress pattern of any subduction zone by extending data farther from the trench;
5) high resolution for paleoclimatic objectives (incl. Milankovitch) at several sites (esp. JS-2), with diatom abundance probably dominating FMS response;
6) diagenesis, especially porcellainites at JS-2.

Comments:

The only debatable aspect seems to be FMS use at J1d, because it is only 380 m penetration. If basement penetration is <30 m, basement FMS logs may not be obtained and no breakouts detected. We think the FMS will work up to base of pipe, but this has not been proved.

Magnetometer/susceptibility

Goals:

1) Magnetic properties of back-arc basin crust;
2) Delineation of flows and possible reversals (former accomplished alternatively by other logs);
3) Paleomagnetic detection of structural tilting or block rotation associated with Japan Sea opening (alternatively and probably better addressed by FMS and FMS core orientation, because cores can be demagnetized).

Comments:

1) With 30 m basement penetration at J3a and J1d and any cavings, the short logs may not justify the time. J1b 100 m basement penetration valuable for goal #1. J1e only 50 m basement, but important for Japan Sea rotation (assuming gyro available).

DMP/WPAC compromise:

1) recommended by DMP at J1b, J1e, J1d, but scheduled by WPAC only at J1b;

2) possible compromise is to follow WPAC plan on J1b (log) and J1d (no log), and DMP plan on J1e (log).

Televiewer

Goals:

Most goals are already accomplished by FMS. However, televiewer would give a much more complete picture of basement fracture pattern and flow/dike delineation. Most useful for J1b, with 100 m basement penetration.

DMP/WPAC compromise:

1) recommended by DMP at J1b, J1e, J3a, and J1d, but scheduled by WPAC only at J1b;
2) possible compromise is to follow WPAC plan on J1b (log, 100 m), J3a (no log, 30 m) and J1d (no log, 30 m), and DMP plan on J1e (log, 50 m).

Vertical Seismic Profile

Goals:

1) seismic stratigraphy;
2) imaging of horizons below bottom of hole (especially for anomalously thick crust of J1b, requiring a large-gun offset seismic experiment).

Comments:

1) second goal tricky when dipping reflectors (most sites) unless offset seismic experiment.
2) Japanese proposal to deploy a seismometer array for long-term monitoring at J1b would also permit a later offset seismic experiment endorsed by DMP 8/87, WPAC, and PCOM 12/87.

DMP/WPAC compromise:

1) DMP/WPAC/PCOM agree on seismometer array deployment at J1b. PCOM added 11 days to Leg 2 for additional logging, including return to J1b for this deployment (J1b to be drilled Leg 1 but leg already 54 days long). In view of extra transit time, reentry time, and especially the chance that cavings and bridges during 1-2 months will require cleaning out the hole before seismometer deployment, should interleg site changes be made to permit J1b drilling and seismometer deployment on the same leg? How much time is really needed for deployment?
2) DMP and WPAC agree on a standard VSP at J1b. Is it really needed, assuming that a later offset VSP will occur?
3) DMP recommended a VSP at J2a (1390 m penetration into a failed rift) but WPAC did not. For WPAC, how important is looking ahead of the bit here?

Packer/Wireline packer

Goals:

1) Pore fluid sampling at J2a, where suspected metallogenesis is a principal goal, to determine whether metallogenesis is occurring today;
2) Stress magnitude via packer frac useful at all sites but reentry cone only scheduled at J1b and J2a. Most useful at J3a (obduction zone) and J1b (because stress causes a seismic anisotropy that may be detected by the oblique seismic experiment);

Comments:

1) 11/86 DMP recommended wireline packer at J2a and packer frac for stress magnitude at J1b, but 8/87 DMP changed this to wireline packer at both and no Keir packer. This is probably a DMP oversight.
2) J3a (obduction zone) now is a short APC hole, then 730 m RCB hole with no reentry; the alternative of an APC/XCB/Navidrill hole with reentry cone could probably be drilled in the same time. 11/86 DMP recommended a

reeentry cone for a long-term observatory of unspecified type (tilt or seismic?). 8/87 PCOM considered a reentry cone for stress but made no decision.

DMP/WPAC compromise:

1) Recommendation of wireline packer for J2a by DMP but not by WPAC. Are two samples enough? Possible compromise: wireline packer only if metallogenesis identified in cores, with locations of 2 samples based on interstitial water analyses.
2) DMP recommendation of packer frac at J1b, changed later to wireline packer, but neither recommended by WPAC. Possible reconciliation: DMP withdraws recommendation of wireline packer at J1b; WPAC evaluates usefulness of packer frac at both J1b and J3a; decisions deferred on packer frac until after packer frac test of Leg 123; DMP retains recommendation of reentry cone at J3a and indicates type of longterm observatory.

Induced Polarization

Goal: quantitative sulfide metallogenesis at J2a.

Comment:

1) If sulfide metallogenesis is present, I.P. would be extremely useful. This is probably the best site for I.P. in the next 3-4 years. Because I.P. need is rare, borrowing the new U.S.G.S. tool for this leg might be better than L-DGO building a tool.

DMP/WPAC compromise:

1) I.P. at J2a recommended by DMP but not WPAC. The tool is probably unfamiliar to both WPAC and PCOM. Should the tool be run only if cores provide evidence of sulfide mineralization?

Geoelectrical experiment

8/87 DMP recommended a geoelectrical experiment at J1b. WPAC will need to know what it would yield and how much time it would take. Is the equipment available?

Geochemical Reference Sites

General

This program, tentatively scheduled by PCOM as one leg, has not been considered yet by DMP. Sites are still uncertain but are likely to include one site with 200m basalt penetration and at least one with 50m basalt penetration. The program focus is on geochemistry of crust entering trenches, for study of the effect of slab composition on arc geochemistry. However, the program also encompasses the primary thematic objective of DMP: comparison of crustal alteration (e.g. permeability, fracture filling, magnetic properties) and physical properties (e.g. velocity structure) between old and young crust and between fast and slow spreading crustal origins. DSDP and ODP have already undertaken extensive downhole measurements of old slow (418A), young slow (395A), and young fast (504B) crust. This leg and Leg 123 will study the missing crustal type: old crust generated at a fast spreading rate. At the other sites, DMP has recommended the full armada of downhole experiments. As leg plans are refined, objectives beyond the reference site objectives are certain to be added to this leg.

Standard logging

Goals:

1) continuous geochemistry of sediments and basalt (continuous, representative geochemical records of much larger volumes than feasible from core analyses are essential for elements such as potassium, less so for isotopic ratios);
2) mineralogy, particularly amounts of alteration minerals;
3) upper crustal physical properties (P-wave and S-wave velocity, attenuation, density, porosity);
4) modern fluid flow (if any) from logs of temperature and calculated thermal conductivity.

FMS and/or Televiewer

Goals:

1) high resolution in sediments (FMS better);
2) structural dip (if any) of lowest sediments, for near-ridge crustal tilting (FMS better);
3) stress direction (Televiewer better);
4) basalt core orientation, for paleomagnetic studies of plate motion and for studies of crustal velocity anisotropy (Televiewer better);
4) imaging of fracturing (filled and open), flow morphology, and flow alteration.

Wireline packer/packer

Goals:

1) permeability, pore pressure, and fluid chemistry of old oceanic crust;
2) hydrofrac for stress measurement (BON8 is on flexural swell immediately seaward of the first(?) extensional breaking of crust entering the trench).

Magnetometer/susceptibility

Goals:

1) magnetic properties (e.g. magnetic alteration, relative importance of induced, remanent, and viscous magnetizations) of old crust generated at

fast spreading rate;
2) complexity of the magnetic record in an environment of well developed magnetic anomalies (e.g. thickness of magnetic units, presence of reversals, variations in remanent inclination).

Dual laterolog
Goals:
1) large-scale porosity structure;
2) relative amounts of vertical and horizontal fractures.

Vertical seismic profile
Goals:
1) large-scale velocity structure of the upper crust;
2) detection of seismic horizons below the bottom of the hole;
3) potential for later offset seismic experiments, for crustal structure and anisotropy.

Long-term experiments?

South China Sea Margin

This program has not been evaluated by DMP, because it was previously a low-priority WPAC program.

<u>Standard logging</u>
Goals:
1) seismic stratigraphy (essential to accurately tie the sites to the excellent seismic transect of the margin, for both eustatic and tectonic objectives);
2) intersite correlation (e.g. logs are probably the main data type from industry wells at landward end of transect);
3) porosity for decompaction and backstripping (subsidence histories are key to the primary cruise objective of testing models of passive margin evolution);
4) mineralogy for paleoceanographic and paleoenvironmental objectives;
5) fluid flow (from uranium, temperature, and thermal conductivity logs; not a stated cruise objective).

<u>FMS</u>
Goals:
1) sedimentary environments (non-marine, shallow marine, siliciclastic, carbonate bank, etc; determination of these types of sedimentary environments is the main industry application of dipmeters);
2) early tilting history of passive margin formation, through structural dip measurements on syn-rift and early post-rift sediments;
3) high resolution, for paleoceanographic objectives.

NE Australia Margin

Standard logging

Goals:

1) seismic stratigraphy (essential to the primary cruise objective of testing the Vail hypothesis);
2) mineralogy, for paleoclimate and paleoceanography;
3) fluid flow (uranium, temperature, and thermal conductivity logs);
4) high-resolution intersite correlation, in spite of lateral variation of sedimentary facies.

Comments:

1) whether sonic logging will yield an accurate depth/seismic link depends on extent of diagenetically caused lateral heterogeneity;
2) very shallow water results in very fast logging times;
3) sites changed somewhat since 8/87 DMP, and further site revision is likely; 12/87 SOHP and WPAC plans differ in sites, water depths, and penetrations, and WPAC plan used here;
4) 5 sites are less than 400m.

DMP/WPAC compromise: both panels recommend standard logging of all sites, including those less than 400m. SOHP did not recommend logging of two shallow sites.

FMS

Goals:

1) sedimentary facies (all sites);
2) high resolution (all sites);
3) imaging of type of porosity (all sites, especially reef carbonates).

Dual laterolog

Goal: characterization of vugular reef porosity, with log penetration deeper and more representative than standard logs.

Comments: DMP previously had inadequate information on the extent of reef carbonates in the sites. Instead of pervasive reef carbonates, they are confined to part of NEA10 and the bottoms of NEA6 and NEA8.

DMP/WPAC compromise: DMP recommended dual laterolog at NEA1,2,3,4,&5, but WPAC did not. Should DMP withdraw their recommendation?

Vertical Seismic Profile

Goal: seismic stratigraphy, for more reliable seismic/depth tie than is obtainable from standard logs.

Comment: another deep site may be added to drilling plans.

DMP/WPAC compromise: DMP recommended VSP at NEA5 (900m penetration), but WPAC did not. Check shots at several sites are another alternative.

Wireline packer

Goals: pore fluid sampling, for carbonate diagenesis, aquifer hydrodynamics, and possible Mississippi Valley Type mineralization.

Comments: conventional interstitial water sampling may be impossible in some lithologies because of core disturbance, and some lithologies may not pack off well enough for wireline packer.

DMP/WPAC compromise: not recommended yet by DMP or WPAC, but DMP was unaware of fluid-flow objective and WPAC is now considering wireline packer. DMP may need more information concerning sites at which wireline packer is scientifically most useful.

Vanuatu

This leg has serious time constraints, even with a modest logging program. If DMP feels strongly about a substantial logging program, they probably should endorse the WPAC view that one leg is not long enough for Vanuatu.

Standard logging

Goals:

1) continuous geochemistry, for composition of accretionary prisms (DEZ-2 and DEZ-4) and seamount (DEZ-5), for arc geochemical changes vs. time caused by arc polarity reversal (IAB-2a) or collision (IAB-1a and IAB-2a);
2) continuous mineralogy, for same purposes as #1;
3) seismic stratigraphy, for site/seismic match in accretionary prism (DEZ-2 and DEZ-4) and for identification of depths in sites IAB-1a and IAB-2a of seismic unconformities;
4) hydrology of accretionary prism (DEZ-2 and DEZ-4) from temperature log and log-based thermal conductivity;
5) porosity of sediments at DEZ-5, for decompaction and subsidence.

DMP/WPAC compromise: both DMP and WPAC recommended standard logging at all sites; DEZ-1 (ridge reference site) is only 300 m penetration (200 m sediments and 100 m basement) and goal is merely determination of rock type so that its components can be identified in the accretionary prism. Although logs would help the goal, cores might suffice.

FMS

Goals:

1) structural dip, folding, fracturing, foliation, and brecciation in the accretionary prism (DEZ-2 and DEZ-4);
2) changes in structural dip in the intra-arc basin caused by collision (IAB-1a and IAB-2a) or arc polarity reversal (IAB-2a);
3) stress direction from breakouts at all sites (possibly not enough overburden at DEZ-1), but particularly in accretionary prism;
4) sedimentary facies (slumps at prism sites DEZ-2 and DEZ-4; slumps and turbidites vs. airfall for volcanogenic sediments at IAB-1a and IAB-2a?).

Comments: FMS applications at reference sites DEZ-1 and DEZ-5 are probably not critical enough to cruise objectives to justify tool use.

Televiewer

Goals: same as FMS goals 1-3, plus flow imaging at DEZ-1, DEZ-2, and DEZ-5.

Comments: 360 degree image is more complete than FMS, but FMS handles wider range of borehole sizes and is faster.

DMP/WPAC compromise: DMP recommended televiewer for bottom portion of prism sites DEZ-2 and DEZ-4, but WPAC recommended televiewer at all sites (before they knew about FMS).

Packer/Wireline Packer

Goal: hydrology (permeability, pore pressure, water chemistry) of accretionary prisms undergoing collision (DEZ-2 and DEZ-4).

Comments:

1) hydrology of accretionary prisms is a DMP priority, but it is only a minor priority of this leg. The focus of this leg is collision-related deformation. However, can this deformation be analyzed without addressing

fluid flow, if recent studies are correct in indicating that pore pressure affects deformation style even in "simple" accretionary prisms?
2) packer would require a reentry cone, but WPAC has not specified whether one is planned at DEZ-2 or DEZ-4.
DMP/WPAC compromise: DMP recommended both packer and wireline packer at DEZ-2 and DEZ-4, with pressure meter (DMP should explain) at DEZ-2. WPAC did not recommend any hydrology experiments.

Geoprops Probe
Goal: mechanical properties of accretionary prism sites DEZ-2 and DEZ-4.
Comments:
1) WPAC did not specify which holes are XCB holes;
2) plenty of time for tool development before this leg.
DMP/WPAC compromise: not previously considered by either panel for this leg.

Lau-Tonga

Standard logging

Goals:

1) continuous geochemistry and mineralogy of sediments and basement (all sites), for temporal and lateral variation in arc and back-arc basin geochemistry and for accumulation rates of hydrothermal metals;
2) seismic stratigraphy of LG3, particularly for identification in core and dating of seismic unconformity "A" (a marker of initial rifting);
3) porosity, for decompaction and vertical tectonics of LG3 (other sites have similar goal but paleodepth resolution of the benthic forams will be less than the porosity correction);
4) temperature and thermal conductivity, for modern fluid flow.

Comments: Two sites are less than 400 m penetration: LG2 (350m incl. 50m basement) and either LG1 (220m incl. 120m basement) or LG7 (200m incl. 50m basement). Final decision on logging these sites should depend on tests of quality of through-pipe geochemical logs.

FMS

Goals:

1) structural dip variations (all sites, particularly forearc site LG3), for timing of rift-related tectonic activity;
2) basement fracturing.

Comments: stress direction not included, because stress pattern can be inferred and because penetrations may be too shallow for breakouts.

Televiewer

Goals: same as FMS, plus basement imaging.

Comments: short holes, large proportion of basement, and combinability of televiewer with magnetometer and susceptometer may make televiewer/mag more productive than FMS for these sites.

DMP/WPAC compromise: DMP recommended televiewer at all sites, but WPAC recommended only standard logging.

Magnetometer/susceptibility

Goal: magnetic properties of arc volcanics and of seafloor formed by back-arc spreading (e.g. are the poorly developed magnetic anomalies of back-arc crust due to greater structural complexity, more diffuse volcanism causing mixed polarity, or more alteration of magnetic minerals, in comparison to "normal" crust?).

DMP/WPAC compromise: DMP recommended magnetometer and susceptibility logging at all sites, but WPAC recommended none.

Wireline packer/packer

Goals: (1) pore water chemistry, for study of modern hydrothermal activity in a region (LG1 or LG7, LG2) with high accumulation rates of hydrothermal metals; (2) permeability of young backarc crust (LG1 or LG7).

DMP/WPAC compromise: DMP recommended wireline packer at all sites, but WPAC recommended none. Compromise could be to use the tool only on the two sites (LG1 or LG7, LG2) where hydrothermal activity is known and a cruise objective. Neither panel considered packer use yet.

Logging Plans Table

for "recommended logs" columns:
W : recommended by WPAC
D : recommended by DMP
yes : needs reevaluation, probable recommendation
? : " " , uncertain recommendation
no : " " , probable cancellation of recommendation;

for "possible revision" column of "days of logging".
first number is "D + yes" (recommended + probable recommendation).
second number is "D + yes + ?" (recommended + probable recomm. + possible recomm.)
"+" means times for experiments with "+" in far right column have not been included because Jarrard doesn't know how much time is needed (e.g. geoprops, deployment of long-term arrays)

	Water Depth	Total Penetration (R:reentry)	Basement	DAYS OF LOGGING: WPAC	DMP	Possible revision	RECOMMENDED LOGS: standard Schlumberger	Formation MicroScanner	televiewer	mag/susc	wireline packer	packer	V.S.P.	other	COMMENTS
...anda/Sulu/SCS I															
BNDA1	4600	800	<50	1.8	1.5	1.5	W,D								
BNDA2	4800	800	<50	2.3	2.2	2.2	W,D		D	D					
SUL5	4615	1115	<50	2.1	2.6	2.6	W,D	yes	D						
SCS5	4000	200	<50	-	-	-	-								
SCS9	4200	500	<50	1.6	1.3	1.3	W,D								
Celebes	4885	800	<50	new	new	1.6	yes								new site
				>7.8	>7.6	9.2									
...n/Mariana															
MAR3	4200	700	?	1.6	1.9	1.4	W,D	D			Dno				
MAR3A	3200	<700	<600	new	new	1.8-2.3	yes	yes	?		yes				new site
BON6	2850	1100 R	150	2.5	3.5	2.3-2.8	W,D	D	Dno	Dno	Dno	?			
BON7	4650	500	?	1.5	1.8	1.8	W,D	D			D				
				>5.6	>7.2	7.3-8.3									
BON1	2270	900	50	1.6	1.4	1.4-2.1	W,D	D			?			?	induced polarization?
BON2	1100	700 R? R	200	1.3	1.2	1.2-3.1	W,D	D	?		?	?		?	" " ?
BON5A	2700	950 R?	-	1.7	1.5	1.5	W,D	D							
BON5B	3400	950 R?	50	1.7	1.6	1.6	W,D	D							
				6.3	5.7	5.7-8.3									
...ankai															
NKT1	4803	900	-	7.0	4.1+	4.7-5.6+	W,D	D	W,D?		W,D	W?	W,D	W,D	mcs? dual laterolog?,+ geopr...
NKT2	4730	1300 R	-	13.0	6.0+	6.5-7.0+	W,D	D	W,D?		W,D	Wyes	W,D	W,D	mcs, dual laterolog, + geopr...
				20.0	10.1+	11.2-12.6+									+ temperature deployment,
...apan Sea I															+ oblique seismic experiment?
J1b	2780	800 R	100	6.5	4.5+	2.7-4.8+	W,D	D	W,D	W,D	D?	?	W,D?	W,D	+ deploy seismometer array, hydrofrac?; + geoelectrical
J1e	2890	880	50	2.0	2.1	1.5-2.1	W,D	D	D?	D?					
J3a	2040	730	30	1.7	1.5+	1.3-2.7+	W,D	D	Dno			?		D	hydrofrac?; + long-term obse...
J1d	3170	380	30	1.5	1.6	0.9-1.1	W,D	D?	Dno	Dno					
				11.7	9.7+	6.4-10.7+									
...pan Sea II															
J2a	2050	1390 R	20	2.0	4.4	2.8-4.4	W,D	D			D		D?	D?	induced polarization?
JS-2	998	600	-	1.2	1.1	1.1	W,D	D							
				3.2	5.5	3.9-5.5									
...ical Ref															
BON8	6000	700 R	200	new	new	5.8-6.7	yes	yes	yes	yes	yes	yes	yes	?	new site; hydrofrac? dual laterolog?
...AR5 or 6	?	? R?	50	new	new	1.7-4.9	yes	yes	yes	?	?	?	?	?	new site; hydrofrac? dual laterolog?
						7.5-11.6									
...otech.															see Nankai

	Water Depth	Total Penetration (R: reentry)	Basement	DAYS OF LOGGING: WPAC	DMP	Possible revision	RECOMMENDED LOGS: standard Schlumberger	Formation MicroScanner	televiewer	mag/susc	wireline packer	packer	V.S.P.	other	COMMENTS
S. China Margin															
131 SCS1	3650	1250	50	2.0	new	1.8	W,yes	yes							
SCS2	3150	1000	<50	1.8	"	1.6	W,yes	yes							
SCS3	2060	1200	<50	1.8	"	1.7	W,yes	yes							
SCS4	750	1000	-	1.4	"	1.4	W,yes	yes							
				7.0		6.5									
Banda/Sulu/SCS II 132															see Banda/Sulu I
NE Australia															
133 NEA1	218	500	-	1.0	1.1	1.0-1.3	W,D	D			?			Dno	dual laterolog
NEA2	285	800	-	1.4	1.3	1.2-1.5	W,D	D			?			Dno	" "
NEA3	412	300	-	0.9	0.9	0.8	W,D	D						Dno	" "
NEA4	956	450	-	1.2	1.1	1.0-1.3	W,D	D			?			Dno	" "
NEA5	1620	900	-	1.5	2.6	2.4-2.8	W,D	D			?		D	Dno	" "
NEA6	1050	300	-	0.9	new	0.9	W,yes	yes							new site
NEA8	1000	300	-	0.9	new	0.9	W,yes	yes							new site
NEA9	400	300	-	0.9	0.8	0.8	W,D	D							
NEA10	487	250	-	0.8	0.8	0.8	W,D	D							
				9.5	>8.6	9.8-11.1									
Vanuatu															
134 DEZ1	2500	300	100	1.3	1.0	0-1.2	W,D?	D?	W,?						
DEZ2	2130	1000	100	2.2	3.7	1.9-3.7+	W,D	D	W,D?		D	D?		D?	pressure meter? + geoprops?
DEZ4	900	1000	-	2.0	3.0	1.8-3.0+	W,D	D	W,D?		D	D?		?	" " " "
DEZ5	1100	750	50	1.7	1.2	1.0-1.4	W,D	D?	W,?						
IAB1a	3075	1000	-	2.3	1.6	1.6-1.9	W,D	D	W,?						
IAB2a	2600	1000	-	2.2	1.6	1.6-1.9	W,D	D	W,?						
				11.7	12.1	7.9-13.1+									
Lau-Tonga															
135 LG2	2600	350	50	1	1.8	1.6-1.8	W,D	D?	D	D	D				
LG3	750	500	-	1	1.7	1.2-1.7	W,D	D?	D	D	D?				
LG1or7	2400	200 R	50-120	1-2	2.3	2.2-2.7	W,D	D?	D	D	D	?			
LG6	4500	550	50	1	2.4	1.6-2.4	W,D	D?	D	D	D?				
				4-5	8.1	6.6-8.1									

Recent geophysical and geological studies of the Banda Sea suggest that its origin may be a combination of entrapment of several small basins and slivering of a contintental borderland into the region. This proposed model of a constructional origin of a marginal sea through strike-slip faulting of continental and oceanic crustal fragments provides a modern analog for rock associations in ancient mountain belts and a system for understanding possible histories of amalgamation of tectonostratigraphic terranes.

The proposed drilling program consists of determining the stratigraphy of the lower sections in the north and south Banda basins to test for similarity or difference in origin, and to compare results with those from the Sulu sea. The Neogene sections will provide information on changes in paleoceanography as the Indian and Pacific ocean circulation systems were isolated, the volcanic history of the eastern Sunda arc, and the timing and history of rifting and emplacement of the ridges.

JAPAN SEA

Japan Sea, one of the western Pacific back-arc basins, is believed to have been formed by multi-axial rifting of the continental arc, much different from the rifting of the oceanic arc. Five major drilling objectives are identified for the Japan Sea: 1) nature and age of the basin basement; 2) style of multiple rifting; 3) obduction of oceanic crust; 4) paleoceanography and marine climatic history in an isolated back-arc basin; and 5) metallogeny in a failed back-arc rift.

EASTERN SUNDA ARC-CONTINENT COLLISION ZONE

The collision between the Australian continent and the eastern Sunda arc has progressed to the stage where continental crust underlies both the forearc in the western part, near Sumba Island, and the forearc beneath Timor Island. The young collision has produced significant uplift of both accretionary wedges and forearc basement, backthrusting of the wedge over the forearc basin and backarc thrusting along the northern slope of the arc. Drilling in this area will allow us to study the timing, sequence and magnitude of backthrusting and backarc thrusting, and the processes responsible for uplift of the forearc.

BONIN INTRA-OCEANIC ARC-TRENCH DEVELOPMENT

The Bonin drilling program is designed to investigate the processes of intra-oceanic arc-trench development in an inherently simple system (continuous subduction since the Eocene without major collisions or arc reversal) in a well surveyed area. The Bonin forearc has experienced little structural disruption since its inception. A broad forearc basin has accumulated volcaniclastic and hemipelagic sediments behind an outer-arc high. The onlap of strata onto this high, together with Eocene shallow-water fossils found on the Bonin islands, indicates that it has been a relative structural high since early in the history of the arc.

The Zenisu Ridge is an oceanic crustal slab, dipping to [illegible], accreting clastic sediments as its base, and accommodating part of the convergence motion between Japan and the Philippine Sea plate. It can be considered as a classical example of intraoceanic accretion and deformation. Drilling in this region will: 1) establish the nature and age of the "trench-fill letre" basin, south of Zenisu; 2) investigate the deformed sediments along the southeastern slope of Zenisu Ridge; 3) establish the nature and age of the crust of the western Zenisu ridge and document the stratigraphy of the overlying sedimentary sequence; and 4) determine the age and the rate of basement tilting of the oceanic crustal slab, along the northern slope of Zenisu Ridge.

LAU BASIN

The Lau Basin is an active back-arc basin between the Lau Ridge (remnant arc) and the Tonga Ridge (arc). Major drilling objectives to be addressed in this region include: 1) the petrologic development of the Lau Basin, particularly the evolution of the basin's basalts from having a significant island-arc geochemical signature to having virtually none at all; 2) the role of silicic magmatism in certain parts of the basin; 3) back-arc geothermal and hydrological processes and their evolution through time; and 4) the nature/development of the Tongan forearc and the history of arc volcanism.

GREAT BARRIER REEF - QUEENSLAND TROUGH

The Great Barrier Reef area is an excellent example of a mixed carbonate/siliciclastic province in a passive margin setting. This area can provide important facies and stratigraphic models for understanding ocean history, the evolution of passive margins, and ancient carbonate depositional systems. The following objectives will be addressed: 1) sea level controls on sedimentation; 2) the effect of plate motions and subsidence cycles on sedimentation, paleoclimate, and paleoceanography; 3) tectonic cycles in relation to sea level cycles; 4) changes in paleoclimate related to plate position and the effect on sedimentation; 5) basin fill history; 6) diagenetic history in a stratigraphic framework; 7) comparison of the history of a continental margin and an isolated plateau (Queensland Plateau); and 8) diagenesis of mixed carbonate/siliciclastic and pure carbonate sequences in an undersaturated ocean regime significantly different to that in the Caribbean and Indian Ocean.

NANKAI TROUGH

f-4

The Nankai Trough is especially suited for studying the complex interactions between stress, physical properties and dewatering processes within the accretionary prism, thought to control the development of small-scale structural fabrics and the evolution of large-scale structural elements such as decollement and major imbricated thrusts. This is because a) the structural framework of the toe of accretionary prism is extremely well-resolved, b) the depth and scale of the decollement and major thrusts are well defined, c) the trench floor is shallow and gas concentration is low, d) the sediments are terrigenous clastics whose response to stress and strain are better understood than that of biogenic sediments, and e) a large amount of supporting and site survey data exist.

The strategy of drilling is similar to the Barbados leg (Leg 110): a reference hole at the undisturbed trench-fill and a deep hole to sample a complete sequence of deformed sediments at the toe of the prism are planned.

Paleoceanographic objectives in the Sulu Sea are focused on the anoxic and suboxic sedimentary record known to exist in this silled marginal sea. Insights into the depositional and paleoceanographic evolution of the Sulu Sea basin will have important implications for the interpretation of analogous Mesozoic and early Tertiary basins which evolved in similar carbonate-rich equatorial settings.

The Cagayan Ridge divides the NW-Sulu Basin (Outer Sulu Basin) and the SE-Sulu Basin (Inner Sulu Basin) and is an excellent area to unravel the complex geodynamic evolution of this region. Drilling here combined with that in the SE-Sulu Basin has direct implications for the interpretation of plate tectonic reorganizations which occured since the Eocene in SE Asia. Recent models relating the Banda, Celebes and Sulu basins as fragments of a once-continuous Indian Ocean plate can be tested by drilling at least one site in the Sulu Sea, in conjunction with the sites in the Banda sea.

SOUTH CHINA SEA

The history of opening of the South China Sea remains unresolved. Conventional dating of ocean basins by magnetic anomaly patterns does not easily work in small basins like the South China Sea. Thus drilling is necessary to confirm the age and history of opening, as well as to determine the history of the surrounding zone of tectonic collision, arc initiation and cessation, and uplift. Stratigraphic records in this basin will show variations in the composition, rate of accumulation, and modes of sediment transport during each phase of rift history reflecting eustatic control on terigenous sediment, climatic control of pelagic materials, and volcanic events accompanying collisional events to the east.

NEW HEBRIDES (VANUATU)

During the Miocene and early Pliocene time the New Hebrides island arc apparently underwent a reversal in arc polarity, after which the Australia-India plate began to underthrust the arc from the west at a rate of at least 10 cm/year. Since this polarity reversal, extensional back-arc troughs formed that probably are still in an early stage of rifting. The d'Entrecasteaux zone (DEZ) encompasses two east-trending aseismic ridges that tower over the Australia-India plate, and the rapid convergence between this plate and the arc carried the DEZ eastward to collide with the central arc beginning about 2 Ma. The unusual morphology and structure of the central arc, as well as the distribution and rates of vertical deformation and the historical seismicity pattern, have been strongly influenced by collision of the DEZ with the arc.

The principal objectives of proposed drilling include: 1) the study of arc processes involved in arc-ridge collision; 2) back-arc rifting; 3) subduction-polarity reversal; and 4) the formation of intra-arc basins.

Information Handling Panel
Executive Summary
18-20 January 1988

88-013
RECEIVED FEB 1 6 1988

The IHP made the following recommendations:

A. Publications

1. Concerning the Editorial Review Board

• The Panel recommends that ODP add a copy edit step to their model of manuscript flow (see page 6), with the final division of where editorial help will be used to be left to the Editorial Review Board.

• That the duties of the outside member of the Board be clearly outlined for him/her at the time that the person makes a commitment (see page 6).

• That the Board have each data paper reviewed by an expert in the measurement techniques used in the data collection (see page 7).

2. Concerning pricing of the Proceedings volumes

• That ODP adopt the model hereby presented as Attachment 4 when charging for copies of the Proceedings volumes (see page 7).

3. Regarding participating scientists who do not fulfill their obligations

• That a system be established under which non-performing participating scientists' names will be ultimately reported to the appropriate governmental or funding agency (see pages 7-9).

B. Computer Services

1. Concerning software development and purchase

• That the CSG develop a manuscript tracking system as soon as possible (see page 7).

• That the CSG select a suitable package of graphics software to run on an IBM/PC in an effort to use the stand-alone computing power of the PCs as much as possible (see page 5).

2. Concerning Hardware enhancement

• To PCOM, that the proposal to enhance the VAX hardware on the ship be accepted (see page 5).

• That limited facilities be provided on board the drillship to allow shipboard scientists to use a wide variety of computer hardware that is standard in the scientific community (see page 5).

C. Repositories

1. Concerning whole round samples

• That taking whole round samples for physical properties studies not be done on a routine basis (see page 10).

• That samples recovered from engineering legs be considered for special studies (see page 10).

2. Concerning the sample distribution policy

• That ODP's request to ammend the sample distribution policy to make it explicit that ODP can request some proof of responsibility from requestors be approved (see page 11).

3. Concerning the collection core photographs

• That the option of making the collection available in the video disc format be pursued (see pages 11-12).

Information Handling Panel

Meeting Notes - January 18-20, 1988

Present: T. Moore, M. Loughridge, A. Loeblich, I. Gibson, M. Jones, J. Nowak, J. Hertogen, R. Merrill, R. Ingersoll, S. Gartner

A. Correction to last minutes: M. Jones was inadvertently left off the "members present" list.

B. Report on action items

1. R. Merrill and P. Brown were not able to get a response from P. Cepek regarding his Mesozoic paleontologic data base. The panel suggested that ODP not rely on this source of data compilation, but rather develop their own complete paleontologic data base.

2. Memorial to L. Musich - A copy of the text prepared by M. Peterson was forwarded to JOIDES for inclusion in the February (1988) issue of the JOIDES Journal. M. Loughridge suggested that a copy should be included in Lillian's last publication, "Lithologic Data from Pacific Ocean Deep Sea Drilling Project Cores," which is ready for distribution from the NGDC, and the Panel agrees.

3. J. Nowak tells of her agreement with the PCOM motion that the authors should be given at least 20 free reprints. She indicates that funds are not available to authors in the F.R.G. for this purpose. The Panel, T. Moore explains, can no longer pursue the issue. PCOM made a recommendation to JOI. JOI did not feel it was able to comply with this recommendation. E. Moussat and J. Nowak should address their concern directly to JOI through their EXCOM representatives.

4. E. Moussat and J. Nowak expressed concern about not having received the necessary materials before they came to the meeting. M. Loughridge suggested that what they would probably find most useful is: a) A copy of the agenda items, b) a list of the action items, and c) a list of problems to be discussed. Judith and Eric feel that that should be sufficient, so long as as much documentation as possible is enclosed so that they can discuss problems with their colleagues before they come to the meeting.

C. Data Base Group Report

P. Brown presented the report (Attachment 1). She also announced the availability of a Technical Note which documents the DSDP data that are available on-line. The Panel expressed their congratulations on the progress being made. P. Brown and R. Merrill indicated that a concerted effort is being made to catch up on entering the back log of visual core description (VCD) data into the data base. T. Moore noted that the VCD back log will continue to exist (and perhaps even worsen) until shipboard VCD data entry into the computer is accomplished. Furthermore, the paleontologic data base, though technically not started until the first Part B of the Proceedings is published, looms large as a potential data base problem because of its size and the great diversity of species reported. Again, an onboard paleontologic data entry system would do much to speed the capture of these data in a data base.

J. Hertogen voiced a concern that the data base layouts that are being developed for shipboard data collection may not fill the needs of the scientists that will use them. J. Foster explained that the forms will be evaluated after they have been in use for awhile.

With respect to the data structure of the systems that are being developed for data collection from studies done post-cruise, it was agreed that P. Brown and R. Merrill will select those that should be sent for review by specialists in the respective discipline. They will send those to IHP, and IHP members will do (or find an expert to do) the review. J. Hertogen and I. Gibson will review the format for the Hardrock Geochemistry data base.

M. Loughridge proposed that all the data that clearly fits into the established format of the ODP "leg-related" data bases, but derives from subsequent samples from DSDP/ODP legs, should be labeled so that they can be identified as such. R. Merrill acknowledged this was the plan. Other data derived from ODP/DSDP material, but of a clearly different type than presently in the data base, will be stored separately.

D. Computer Services Group Report

J. Foster presented the CSG report (Attachment 2).

The CSG is giving first priority to development of computerized data collection on the ship. Programs for the scientists to extract data will come next. J. Foster presented plans to upgrade the VAX system on the ship (development of local-area VAX cluster), and discussed the guiding philosophy of trying to use the stand-alone computing power of the PCs as much as possible. IHP fully supports this proposal as suggested by the CSG. We recommend that PCOM accept this proposal.

IHP endorses the efforts of the CSG to develop stand-alone data acquisition modules which run on the IBM PCs and which allow the data to be later moved to the S1032 data base management system. IHP recommends that the CSG select a suitable package of graphics software to run on an IBM/PC, and try to resolve difficulties in using output from such a graphics system in the production of the Proceedings, Part A.

IHP endorses the efforts of the Science Services Department to keep abreast of changes in the hardware and software available, to ensure that an optimum combination is in use, and that users are not locked into a particular hardware and software environment. We also endorse the efforts of the CSG to install a minimum set of software tools on the IBM PCs. We feel that this basic software installation should include:

Wordprocessing software and its associated dictionaries (WordPerfect)
A wordprocessing translation package
A communications and file transfer package
A spreadsheet package (preferably compatible with Lotus 1-2-3)
Some system and memory resident utilities

We recommend that limited facilities be provided on board the drillship to allow shipboard scientists to use a wide variety of computer hardware that is standard in the scientific community such as: 3.5" drives in addition to the present 5.25" standard, IBM PC software that requires the use of the newer EGA/VGA standards, graphics software that uses an IBM PC parallel printer, and MacIntoshes.

The Panel also agreed that scientists that are scheduled to participate on a cruise need to be informed as to what is available on the ship, both with respect to software and hardware. Updated information in that respect should be routinely sent to them. R. Merrill and J. Foster explained that this is already being done and the effort will continue.

E. Publications Report

The Publications report was presented by W. Rose (Attachment 3)

The Panel discussed the model of manuscript flow and of the duties of the Editorial Board as presented by ODP (Attachment 3-D). T. Moore presented comments received from individual scientists privately and from the meetings of the Panel Chairmen and Planning Committee held in November. As supported by these comments, IHP made the following recommendations.

1. Editorial Review Board

The Panel recommends that ODP add a copy edit step to their model of manuscript flow. Copy editing for consistency and accuracy should be performed after the manuscript has been accepted for publication and before it goes to production. Given the limited editorial manpower available, the relative proportion of time spent on this activity versus that spent in aiding non-English speaking scientists to produce acceptable manuscripts will vary from leg to leg. It should be left up to each editorial board how this division of editorial labor will be made.

The Panel is pleased that ODP has been able to find established scientists to serve as outside Editorial Review Board members for the volumes now in progress. IHP recommends that the duties of the outside member of the Board be clearly spelled at the time that the person makes a commitment, much in the same manner as the responsibilities of the co-chiefs are pointed out in the "contract" that ODP will ask co-chiefs to sign.

The Panel recommends that the editorial board have each data paper reviewed by an expert in the measurement techniques used in the data collection. The object of this review is to assure that the methods description and data presentation are accurate and complete.

IHP fully supports the need for ODP to make ad-hoc decisions based on the peculiar characteristics of each leg to ensure that the quality of the volumes is maintained.

Publications requested guidance from the Panel regarding how to list the members of the ERB on the title pages. IHP wants Publications to draw some models to be presented at the next IHP meeting.

The complexities of the proposed Editorial Review Board system pose an urgent need for a computerized manuscript tracking system. The Panel recommends that the CSG develop such a system as soon as possible. The Panel further indicates that a) the system should be developed in a modular fashion, and b) it should be accessible by the Editorial Review Board members.

2. IHP recommends to PCOM that ODP adopt the model hereby presented as Attachment 4 when charging for copies of the Proceedings volumes. This model reflects the actual cost of producing the books.

3. Non-Performers

T. Moore reported on the alarmed response of PCOM when they were told that some shipboard and shore-based ODP leg participants received data and samples, yet failed to produce a manuscript for the leg volume. These scientists are labeled as "non-performers" by ODP, yet they have sometimes been asked to participate on additional ODP legs because they were recommended either by PCOM or by their sponsoring nation, and are needed for both, political balance and the shipboard balance of scientific expertise.

J. Hertogen explained that it is important that non-U.S. panel members know who the non-performers from their countries are because each country wants to have good representatives for their limited seats on ODP legs, particularly for co-chiefs. This feeling was also expressed by non-U.S. members of PCOM.

There are basically three classes of "non-performers." Those who do not participate in any way with the ODP legs, but receive samples or data after it becomes public domain. This part of the problem is handled within ODP, based on their curatorial policy, which briefly put is "if you don't report on samples already received, you don't get more samples." The second kind of non-performer is a shipboard scientist who receives samples or data, promises a manuscript, but does not deliver one for the ODP volume. The third is a co-chief scientist who does not fulfill his post-cruise responsibilities regarding the production of Volumes A and B of the Proceedings.

The policies regarding performance of participating scientists for DSDP and ODP legs have been in place since almost the beginning of the Program. IHP wants to set in motion a rigorous enforcement of this policy. The issue is more critical now, when co-chiefs are responsible for much of the work in getting the Proceedings volumes published.

A. Meyer explained that the main problem with respect to non-performing co-chiefs as members of the Editoral Review Board will be dealing with those legs for which the co-chiefs accepted the position under the previous model. R. Merrill explained that the responsibilities of the co-chiefs and participating scientists on ODP cruises have not changed. However, to make these responsibilities more clear, A. Meyer drafted a document that the co-chiefs will be asked to sign. The document spells out what is expected of co-chiefs in the manner of contribution toward the publication of both Initial and Final Reports of the Program.

The Panel reached a consensus that the contract that ODP proposes that co-chiefs be asked to sign includes enough provisions to ensure that they perform their function. The Panel will endorse this contract after a few minor changes have been made.

U.S. scientists can be screened for previous performance at the time of selection of participants for each cruise, but at present there is no system in place by which ODP provides this sort of background information on people that are being considered for participation in a cruise as representatives of other ODP member countries.

IHP recommends that a system of reporting those who do not perform be established. Under such a system, ODP/TAMU and the Borehole Research Group would be required to provide a list of non-performing participating scientists to the IHP. The list would be reviewed prior to submission to IHP to exclude those who had valid reasons for not fulfilling their obligations. IHP would examine the list and recommend to PCOM that notification letters be sent to those perceived as non-performers. The letters would explain that if an acceptable explanation is not received, the non-performers' names will be reported to the appropriate governmental or funding agency.

4. After discussions with M. Loughridge and M. Jones, ODP announced that it planned to cooperate in developing the World Data Center A, 1:40,000 scale base map series.

F. Repositories Report

1. C. Mato presented the report (Attachment 5). She stressed the fact that the work load at the repositories is increasing while staffing remains at the same, or at an even lower level.

An expansion of the West Coast Repository is being planned. The expansion would include an additional sampling table. As it is right now, with one sampling station, all work on filling sample requests stops when there is a visitor collecting samples.

2. Whole Round Samples

Over the past few months there has been an increasing number of requests for whole round samples. In addition, a recently completed USSAC workshop on physical properties strongly recommended increased use of whole round samples for a variety of physical measurements. After discussion of these needs and the constraints of the present sampling policy, the Panel made the following recommendations:

The task of routinely taking whole round samples for physical properties studies is very time-consuming. IHP recommends that such sampling not be done on a routine basis.

In view of a need to respond to whole round sample requests in a timely fashion, IHP decided to delegate its responsibility to the Curator for routine decisions regarding such requests. R. Merrill, in cooperation with B. Bryant, will draw up a policy to handle whole round sample requests and will submit it to IHP for review. The Curator may choose to refer a request for consideration by the IHP.

After the JOIDES Panels are restructured (as proposed by PCOM) the IHP will forward a copy of the whole round sampling policy to the appropriate panel for review.

IHP reviewed the whole round sample requests that were pending, and agreed on the following actions:

a) Approve the whole round sample requests for legs 117 and 118.

b) Approve the Leg 123 request subject to actual recovery and approval by the co-chief scientists.

c) Approve the Leg 119 request with the exception that the number of samples requested by Pittinger for the consolidation studies be limited to five 10-cm sections.

3. Sample Policy

IHP endorses the geriatric core study to be carried out as part of the curatorial program (see Attachment 6).

IHP recommends that samples recovered from engineering legs such as 125E be considered for the proposed study of geriatric cores, and for physical properties studies requiring closely spaced whole round samples.

ODP would like to be able to amend the sample distribution policy so as to make it explicit that ODP can request some proof of responsibility of the scientists submitting requests for samples. Such proof could consist of a bibliography of papers published by the individual, a resume, or an abstract of that individual's dissertation proposal endorsed by his/her graduate committee chairman. IHP recommends that this request be approved. A copy of the amended section is included as Attachment 6C.

IHP thanks Russ McDuff for the inventory of the DSDP Interstitial Water samples.

G. Paleontological Reference Centers

T. Moore determined that the Smithsonian Institution in Washington was asked to serve as a Paleontological Reference Center approximately six years ago. They are still willing to take on the materials. T. Moore presented a motion to designate the Smithsonian to be the Eighth Center, barring any contrary directive from PCOM. The motion was approved unanimously. T. Moore will let R. Merrill know when he should send the materials to the Smithsonian.

PCOM approved funding for the Centers out of the JOI budget. W. Riedel and J. Saunders need to get together an acceptable proposal to support continued sampling and sample preparation. They also need to document the fact that the Centers are being used. T. Moore will talk with T. Pyle regarding the procedures for submission and review of this proposal in time to be considered for FY 1990.

Japan got their center off the ground quickly and it has been well received.

H. Collection of core photographs

IHP reviewed the report by R. Merrill and J. Beck regarding the options to archive core photographs (Attachment 7). The core photographic collection will be available chiefly as a library tool, used for rapid searches of cores for particular features or for planning a sampling program. The Panel endorses the option of the video disc, mainly because of the capability of conducting library searches. Further, IHP recommends that an index be prepared and included as the first few frames on the disc.

I. Logging Operator's Report

T. Moore presented the report that was sent by C. Broglia (Attachment 8). The request by M. Lovell for a large number of core tapes was discussed. The Panel requests that Cristina inform IHP before responding to similar large requests which propse to set up a subsidiary data base. M. Jones will check with M. Lovell to make certain that he does intend to make log data available to British scientists.

J. National Geophysical Data Center Report

M. Loughridge reported that the NGDC finished the publication of "Lithologic Data from Pacific Ocean Deep Sea Drilling Project Cores."

The following DSDP files at the NGDC have been fully quality-controlled and errors annotated in their accompanying documentation files: age codes, age profile, Core Curators', core depths, paleontology, fossil codes, site summary, screen.

Quality control is underway on the visual text and smearslide data files. Smearslide appears to have problems.

The site summary, age profile, Core Curators', and core depths files are all fully searchable as dbase III+ files on a local AT-clone.

The NGDC also received funding from USSAC to put the DSDP data base on a CD-RAM disc, with separate funding for making 500 copies. There will be enough room on the disc to include the DSDP subject index, which they will try to do.

Action Items

1. R. Merrill and P. Brown will send the data structure formats that need review to the IHP. IHP will do, or find an expert to do, the review.

2. J. Hertogen and I. Gibson will review the format for the hard rock geochemistry data base.

3. ODP Publications will draw a few models of title pages listing the Editorial Review Board. The models will be studied at the next IHP meeting.

4. R. Merrill, in cooperation with B. Bryant, will draw up a policy to handle whole round sample requests and will submit it to IHP for review.

5. T. Moore will talk with T. Pyle about the procedures for submission and review of the proposal to support continued sampling and sample preparation for the Paleontological Reference Centers.

6. T. Moore will let R. Merrill know when to send the materials for the eighth Paleontological Reference Center to the Smithsonian Inst. in Washington.

7. M. Jones will check with M. Lovell to make certain that Lovell does intend to make log data available to British Scientists.

8. J. Hertogen, E. Moussat and M. Jones will investigate cases of participants from their countries who have failed to complete manuscripts for Part B, volume 101 of the Proceedings.

Attachments 1 - 8 for
IHP minutes January 88
are attached separately.

88-113

OCEAN DRILLING PROGRAM

TECHNOLOGY AND ENGINEERING DEVELOPMENT COMMITTEE

REPORT OF THE 5th MEETING

February 4th - 5th 1988 - Houston, Texas

S U M M A R Y

I. LIST OF ATTENDEES

1.1. TEDCOM Members
Jean JARRY, IFREMER, chairman
Martin CHENEVERT, University of Texas
Bill COTTEN, CHEVRON (replaces W.J. LOWE)
Hiromi FUJIMOTO, O.R.I., Japon (replaces Junzo KASAHARA)
Archie Mc LERRAN, consultant
Keith MANCHESTER, BIO, Canada
Keith MILLHEIM, AMOCO
Charles SPARKS, IFP, France
Frank SCHUH, consultant
Paul STANTON, EXXON
Walter SVENDSEN, LONGYEAR

1.2. Alternates
Bob HENDRON, LANL (for Bert DENNIS)
Heinrich RISCHMULLER, Clausthall University, FRG (for C.MARX)

1.3. Liaisons
Barry HARDING, TAMU
Tim FRANCIS, PCOM
Paul WORTHINGTON, DMP

1.4. Permanent observers
Percy WICKLUND, DOSECC
Duke ZINKGRAF, SEDCO

1.5. Observers
Noel AVOCATO, CHEVRON (alternate for Bill COTTEN)
Jean BONNASSE-GAHOT, ELF-AQUITAINE
Bob BRYNGELSON, MER ENG. Inc. (part time)
Jean DELACOUR, IFP

1.6. TAMU-EDO Staff
Linda CHATHAM, staff assistant
Charles HANSON, Drilling operator
Steve HOWARD, engineer
Alan MILTON, "
Dan RENDELHUBER "
Mike STORMS, Supervisor of dev. eng.
Frederic YOUNG, engineer

1.7. Absent and not replaced TEDCOM members
David GRASSICK, ENTERPRISE Oil, G.B.
Emilio LUNA SIERRA, HISPANOIL, Spain

II. AGENDA

FEB. 4th a.m. 8.30 - 12.00

1. Welcome to members and observers and practical information	( )	B. HARDING J. JARRY
2. Chairman activity report		J. JARRY
3. PNCHMN and annual PCOM meetings reports		"
4. Operational report legs 112-119		B. HARDING
5. Engineering report		M. STORMS S. HOWARD A. MILTON

p.m. 1.30 - 5.30

6. COS[illegible] [illegible] p[illegible]	T. FRANCIS
7. General discussion on mining technology	

FEB. 5th a.m. 8.30 - 11.30

9. Closed session (TEDCOM chairmanship)

10. General discussion on deep drilling

11. Next meeting

III. CHAIRMAN ACTIVITY REPORT

After the riser workshop and the 4th TEDCOM meeting (April 30th-May 1st), a group of 5 people met in Dallas in early June to prepare a white paper for COSOD 2. B. Harding, F. Schuh, N. Avocato, P. Stanton and D. Zinkgraf proposed a tentative plan to drill deeper, in rocks and fractured rocks, including 4 solutions:

. use of a conventional riser equipped drilling ship (18" 1/2 drill pipe)
. use of a mining type system
. use of a slim-line riser
. use of a mud lift system on sea-floor

B. Harding, D. Zinkgraf, G. Foss and J. Jarry attended the COSOD 2 conference in Strasbourg(July 6-7-8). The white paper attracted wide interest since a large number of scientists wish a future capability of deeper drilling. A short report about this conference was sent to TEDCOM members.

In early december, J. Jarry attended the annual PNCHMN and PCOM meetings at Sunriver, Oregon. The results of these meetings are as follows :

1. Engineering priorities (mid-term and long-term) are now well defined (see annex 1)

2. Importance of engineering tests on land and at sea is formally recognized. Specific J.R. legs will be devoted to such tests, the first one being planned for December 1988-January 1989.

3. Liaisons between science panels and engineers will be improved :

3.1. DMP chairman will be permanent liaison to TEDCOM.

3.2. A DOSECC engineer will be permanent observer at Tedcom meetings and a TAMU engineer will participate at DOSECC meetings.

3.3. TAMU engineers will be liaisons to thematic panels and to some regional panels (in addition to or in replacement of TAMU-ODP science staff).

4. The whole ODP structure is now fully conscious that a significant increase of the engineering budget is a vital necessity.

In the ODP 1988 budget, 4 % had been set apart for emergencies and exceptional purchases. Half that amount (i.e. 2 % of the budget = $ 600,000) has just been attributed to engineering in addition to its regular budget, thus making it above the $ 1M mark.

J. Jarry added that TEDCOM's voice is listened to and thanked all those members who have helped to get that result. He encouraged all members to keep contact, between meetings, with the engineers in College Station, and to get ready to give their expertise, each time it is needed.

IV. OPERATIONAL REPORT

4.1. Staff

A new engineer, Dan Reudelhuber has been hired, but Alan Milton and Fredric Young will leave soon, to return to their countries.

Barry Harding reminded members that he is eager to welcome visiting engineers for 1 or 2 years, or also as participants to the engineering test legs.

CHEVRON and AMOCO each proposed to send one engineer to the [illegible]-09 test leg, while [illegible] will try to send to College Station a soil mechanics engineer.

4.2. Legs 112 - 119

No major problems occurred and many tools wers used successfully :

recoverable beacons - leg 112
Navi drill - leg 114
Kinley sandline cutter
etc...

On leg 116, XCB cored 935 m BSF, which is a record. Navidrill has been redesigned for a better efficiency and will be used on leg 121. TV reentry is now used on a permanent basis : some minutes only are needed instead hours when using sonar.

Steve Howard then presented results of leg 118 in which a positive displacement coring motor (PDCM) had been used. It seems that the main problem is the choice of a good bit, adapted to terrain conditions. K. Millheim said that it is absolutely vital to know the physical properties of the formation in order to select the best tool and the best adapted bit.

TEDCOM recommends that the shipboard equipment be upgraded, in order to measure physical properties on cores, as soon as they get on deck. It will be thus possible to adapt, almost in real-time, the drilling tool to terrain conditions.

This information will also lead to a better design of new tools.

As far as Navi-drill is concerned, the usefulness of an active heave-compensation system is acknowledged, as well as the use of bumper-subs to control weight on the bit in the bracket 1000 - 2000 lbs.

V. KTB and DOSECC

H. Rischmuller shared his experience of the German Continental drilling project, followed by P. Wicklund, who talked about the El Cajon Pass project.

VI. ENGINEERING REPORT

6.1. Mike Storms, who is now supervisor of development engineering presented a chart of "generic" technology requirements in connection with the upcoming legs (1988/1991), and a similar chart for the subsequent tools to be developed or adapted. With such charts (Annexe 2 and 3), TAMU-EDO will have a better advanced planning (budget and staff).

6.2. Alan Milton presented his Lubinski analysis of joints fatigue life. On leg 117, bending stresses measurements have been done. Theory and measurements drove Milton to Knobby joints design (joints equipped with protectors). These 3 joints are put between the rotation table and some meters below the keel, and reduce the bending stress to avoid an early failure of the drill string. Knobby joints must be used each time that pitch and roll exceed 4 degrees or when pipe is stationary for long periods (e.g. logging). Rotating hours are recorded and after 400 hours of rotating time, Knobby joints will be retired from service.

C. Sparks said that in order to know better the ship's motions and to deduce what are the loads on a drill pipe (or a nodules lifting pipe), a digital "pallograph" will be installed soon on the J.R., with automatic recording of all the data for 2 years.

-o-

VII. COSOD 2 REPORT (T. Francis)

The official report of the COSOD 2 conference has been just published. Among the recommendations related to technological requirements, it is said that the "engineering budget must be increased progressively up to $ 5 million/year to achieve the necessary innovations, in time for the deep drilling to take place".

VIII. DIAMOND MINING SYSTEM

Fredric Young listed 5 concepts he has studied for high speed diamond coring systems, with their advantages and disadvantages, as well as with their theoretical depth limitations.

1. Navi drill core barrel (NCB)
2. Mud-motor with conventional core barrel
3. Hollow rotor with PDM or turbine
4. Improved NCB with an hydraulic thruster
5. Drill rod inside drill-pipe

Concept Nr 3 and 5 would give the best penetration, but concept Nr 4 would support the largest waterdepth (3900 m).

A widely opened discussion followed. Among the most characteristical points of view, let us quote :

. in case 5, power will be needed to overpass the friction, unless high lubricant fluid be used.

. up to 700 meters of water, success is guaranteed with a 98 % recovery down to 2000 meters (case 5).

. Turbines are unpredictable tools : the actuel RPM developed are not accurately known at the surface.

Although TAMU EDO engineers favored concept n°4 and ensured that they can be ready for leg 125, most of TEDCOM people thought that a riser type solution would be better.

But K. Millheim insisted upon the absolute necessity of an efficient heave compensation system such as used in Norwegian waters.

In the present situation of a minimum engineering budget, only a "poor-boy" solution can be envisaged, designed and built to start tests as soon as possible.

Land tests, although useful, will not prove enough and only sea tests will give sufficient information. It is necessary to define modest goals in a first phase, since at the present time, nobody knows what is the ideal way to drill 2000 meters of rock in 3000 meters of water with 90 % recovery rate.

A consensus was at last established for the following principles :

. use of the smallest diameter available, which means the mining rod inside the present 5" ODP pipe and not the ODP pipe inside a slim line riser ;

. use of a stable platform, which means the use of a heave compensation system at the top of the present drill-pipe, used as a riser ;

. depth limitation to 700 meters for the first tests, with hope of at least 500 meter penetration at a rate of 10 meter/hour.

TEDCOM RECOMMENDS:

1. That consideration be made to spend engineering time and budget to perform testing of slim hole type coring exploration (mining size)

1.1. by use of existing components

. 5" S-135 drill pipe, used as a riser, with handling tools, etc.

. mining drill rod, coring equipment, bits (modified), circulating systems.

1.2. by developing a method to latch a 5" drill pipe to sea bed base, pile, casing, or/and other devices acting as fixed connection.

1.3. by using existing compensator to support the 5" drill-pipe and hold it under constant tension, and thereby allowing the top of the 5" drill pipe to be fixed relatively to the sea bottom and not subject to the ship motion.

1.4. by developing a connection between the compensator and the platform that can allow installation of the rotating/circulating system on top of the 5" drill pipe, and providing enough area and vertical height to allow operation of the system, i.e. addition of singles for drilling/coring, while using existing or modified feed-off systems.

2. That a test take place in shallow water (no more than 700 meter) to evaluate the suitability of proving a possible increase in penetration rate and, more important, an increased core recovery in fractured formations.

Many problems will arise when adapting these methods to full scale deep water operations. However, this solution represents a good engineering starting point in order to evaluate the next steps to be taken.

Then Barry Harding listed all the technical problems to be solved during the preparation of this feasibility test.

1. drill rod evaluation
2. measurements of mining systems
3. heave compensation
4. surface equipment (Rig)
5. mud (lubricants)
6. latch-in of pipe and sea floor
7. sea-floor structure - reentry cone
8. core barrels and recovery technique
9. bits - cutting shoes
10. pumps and circulation equipment

IX. TEDCOM CHAIRMANSHIP

During a closed session, J. Jarry reminded the Committe of the role of the TEDCOM chairman, as he saw it. It was :

1. to understand the compatibility between the scientific objectives and the technical possibilities in the frame of a budget bracket ;

2. to make the marketing of realistic engineering projects to the scientific and administrative communities ;

3. to be a focal point between TEDCOM members, TAMU engineering team, TAMU ODP science, JOIDES structure, JOI ;

4. to keep in mind the international spirit of the program and a balanced technical participation of the member countries

Then TEDCOM members voted for the replacement of J. Jarry who had resigned from TEDCOM.

Charles Sparks was elected by 12 "Yeah", 0 "Nay" and 1 abstention. This choice will be submitted to PCOM for approval.

X. NEXT MEETING

H. Rischmuller agreed to have the next meeting (september-october) in Germany, in the area of the KTB site.

Exact dates and location will be decided by C. Sparks and H. Rischmuller in the weeks to come.

ANNEX 1

Engineering priorities (December 1987)

MID TERM

1. Drilling and core recovery in interbedded sequences
2. " " " in young basement fractured rock
3. " " " in unconsolidated turbidites
4. Drilling and logging in high temperatures

LONG TERM

5. Deeper drilling

(a 3 Km hole through the crust by the year 2000)

United States Department of the Interior

GEOLOGICAL SURVEY

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

March 17, 1988

MEMORANDUM

TO: Nick Pisias, Chairman, JOI-PCOM

FROM: Mahlon Ball, Chairman, JOI-PPSP

SUBJECT: PPSP meeting of 3/9-10/88

This meeting was held at the offices of British Petroleum, West Britannic House, London, England.

Attendance:

Mahlon Ball, JOI-PPSP
George Claypool, JOI-PPSP
Paul Haseldockx, JOI-PPSP
Dave McKenzie, JOI-PPSP
David Roberts, JOI-PPSP
Gunter Stober, JOI-PPSP
Lou Garrison, ODP-TAMU
Charles Hanson, ODP-TAMU
Kevin Burke, ODP Safety Comm.
Tom Thompson, ODP Safety Comm.
Hank Wories, ODP Safety Comm.
Felix Gradstein, co-chief, Leg 123
Bill Haq, co-chief, Leg 122
Ulrich von Rad, co-chief, Leg 122
Paul Williamson, geophysicist, Leg
Carl Brenner, JOI Site Survey Data Bank
Nick Pisias, JOI-PCOM Liason

Meeting Synopsis:

Lou Garrison reviewed current drilling on Leg 119 in Prydz Bay, Antarctica and on the Kerguelen Plateau.

George Claypool expressed the PPSP rationale for PPSP's request that sedimentation rates be included as an item on future Joides Safety Review Check Sheets, as follows: At sedimentation rates greater than 40 m/10^6 yrs, production of microbial methane is common in marine sediments. Rapid sedimentation rates result in the elimination of dissolved oxygen and sulfate in sediment pore water and facilitate production of methane by fermentation of organic matter.

Felix Gradstein, Bill Haq, Ulrich von Rad and Paul Williamson summarized scientific goals and regional geology of the Exmouth Plateau (EP) and Argo Abyssal Plain (AAP) off northwest Australia.

The Safety Panel conducted a site by site analysis of proposed drilling locations on EP and AAP.

- EP2A, Approved to 1400 m sub-bottom penetration at day: 74, time: 2000 on seismic line, BMR 55/002.
- EP6, Disapproved because of bright spots in the seismic profiles in the vicinity of EP6.
- EP7F, Disapproved because site is on a regional structural high where exploration wells have penetrated gas bearing sands.
- EP9E, Approved to 1200 m sub-bottom penetration under the following conditions: Condition 1 EP9E must be drilled after EP10A and EP10A must have no significant hydrocarbon shows. Condition 2 A 5 mile square seismic grid, with 1 mile line spacing (approximately 50 miles of profile) must be shot centered on the proposed location of EP9E and EP9E must be sited in a structurally low position on the Callovian unconformity, based on the seismic grid.
- EP9F, Approved at the site proposed to a sub-bottom penetration of 1300 m.
- EP10A, Approved to 1400 m sub-bottom penetration with the stipulation that the site be moved updip to day 114, time 1037 on seismic line 56/020B.
- EP11B, Approved as proposed.
- EP12, Disapproved for the same reason as EP7F.
- AAP1B, Approved as proposed.
- AAP2, Decision deferred until an accurate location is specified.

PPSP approved John Peirce's request for an additional site on the Ninety east Ridge: CNR-5; and, Jeffrey Weissel's request for changes in Broken Ridge drill sites.

PPSP agreed to meet in Houston, TX on 4/5/88 to reconsider sites EP6, EP7F, and EP12 with structure and isopach maps in the vicinity of the Vinck, Eendracht and Zeowolf wells and with well log analyses of Vinck, Eendracht and Zeowolf exploration well in an attempt to decide on reasonable site locations for EP6, EP7 and EP12.

Charles Hanson, ODP-TAMU, described a C_1/C_2 ratio change encountered in drilling on the Oman Margin and posed the question to PPSP whether this change should have been sufficient reason for stopping drilling. George Claypool led the resulting discussion and it was concluded that drilling should have been stopped. PPSP decided that a review of hydrocarbon occurrences in DSDP-ODP holes would be compiled and on the basis of the compilation guidelines would be specified by PPSP for recognition of hydrocarbon anomalies deemed significant enough to suspend drilling.

PPSP reviewed guidelines for safety review presentations. PPSP decided that chief scientists should be in contact with the PPSP chairman prior to each safety review and that present guidelines should be updated by the PPSP chairman.

The next regular meeting of PPSP was tentatively designated as 7/14-15/88 in Corvallis, Oregon.

ODP SITE PROPOSAL SUMMARY FORM

(Submit 6 copies of mature proposals, 3 copies of preliminary proposals)

Proposed Site: SCS-5B

General Objective: Age and nature of southwestern South China Sea Basin

General Area: South China Sea Basin
Position: 12°34'N, 114°32.5 E
Alternate Site:

Thematic Panel interest: TECP, LITHP
Regional Panel interest: WPAC

Specific Objectives:

1) Age and nature of basement
2) Stratigraphic and paleo-oceanographic correlation with other ocean basins of the Banda-Celebes-Sulu-SCS transect

Background Information (indicate status of data as outlined in the Guidelines):

Regional Geophysical Data:

Seismic profiles: LDGO MCS, plentiful LDGO single channel, SONNE MCS, CHARCOT single channel data

Other data: Piston cores, heatflow, 3.5kHz, topography, magnetics, gravity

Site Specific Survey Data:

Seismic profiles: CONRAD 2612 MCS Line 591, 31 October 1985 at 1028Z, crossing near VEMA 3504 and VEMA 2818 single channel profiles.

Other Data: Heatflow and seabeam profile, voluminous regional seismics.

Operational Considerations:

Water Depth:(m) 4350 **Sed. Thickness:(m)** 750m **Tot. penetration:(m)** 800m

HPC ___ **Double HPC** ___ **Rotary Drill** x **Single Bit** x **Reentry** ___

Nature of sediments/rock anticipated: Hemipelagic turbidites

Weather conditions/window: Avoid Aug.-Sept.

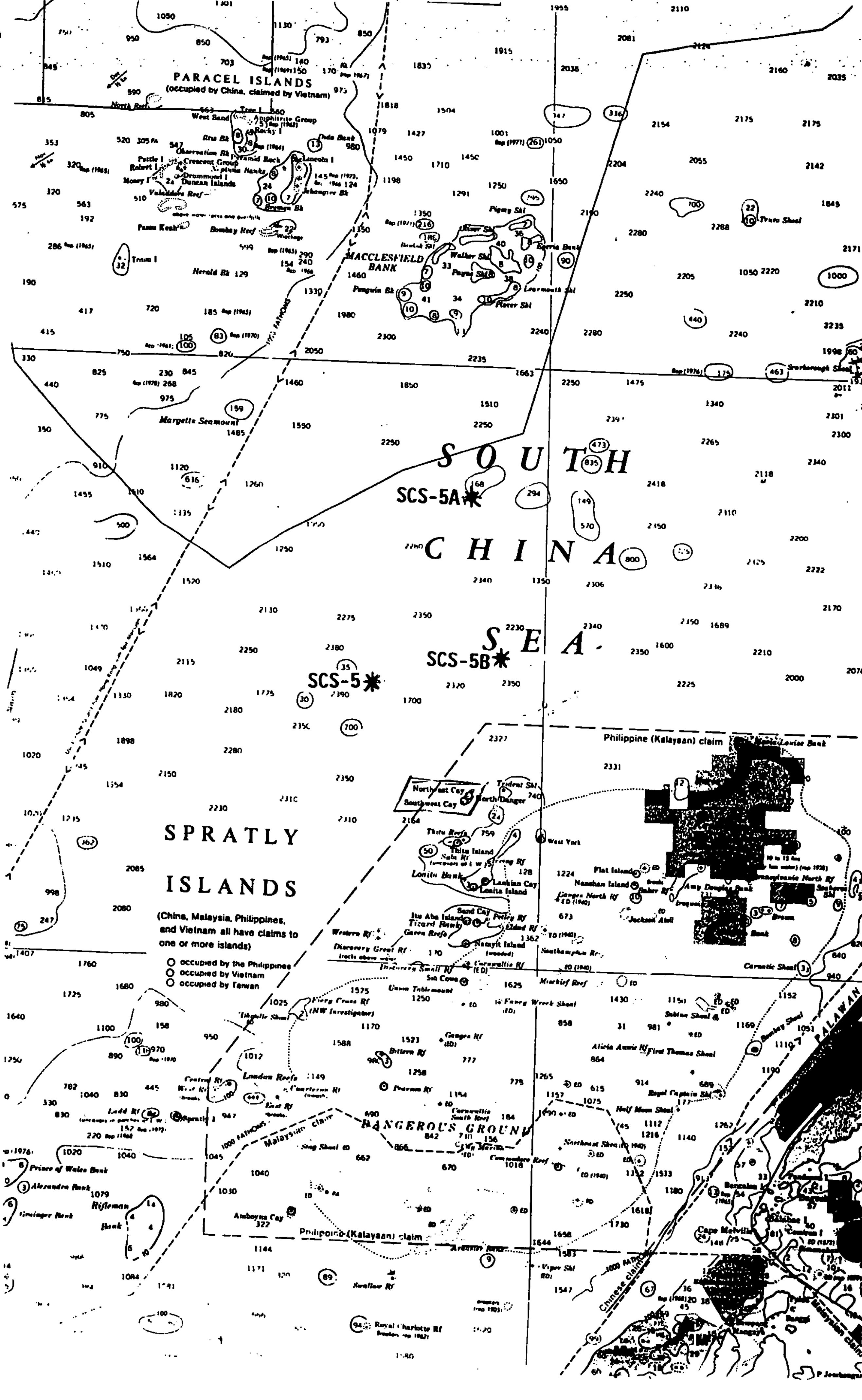
Territorial jurisdiction: Philippines (hopefully)

Other: This location should avoid difficulties with Vietnam

Special Requirements (staffing, instrumentation, etc.):

Proponent: S. Spangler, D. Hayes
Address & phone number:
Lamont-Doherty
Route 9W
Palisades, N.Y. 10964
914-359-2900

FOR OFFICE USE:
Date received:
Classification no.:
Panel allocation:


PARACEL ISLANDS
(occupied by China, claimed by Vietnam)
Amphitrite Group
Crescent Group
MACCLESFIELD BANK
Margetts Seamount
Scarborough Shoal
SOUTH CHINA SEA
SCS-5A
SCS-5B
SCS-5
SPRATLY ISLANDS
(China, Malaysia, Philippines, and Vietnam all have claims to one or more islands)
occupied by the Philippines
occupied by Vietnam
occupied by Taiwan
Philippine (Kalayaan) claim
Malaysian claim
Chinese claim
DANGEROUS GROUND
Northeast Cay
Southwest Cay
North Danger
Thitu Reefs
Thitu Island
Loaita Bank
Lankiam Cay
Loaita Island
Flat Island
Nanshan Island
Itu Aba Island
Tizard Bank
Namyit Island
Sin Cowe
Mischief Reef
Fiery Cross Rf
London Reefs
Spratly I
Amboyna Cay
Prince of Wales Bank
Alexandra Bank
Rifleman Bank
Royal Charlotte Rf
Swallow Rf
First Thomas Shoal
Half Moon Shoal
Commodore Reef
Cape Melville
PALAWAN
1000 FATHOMS

NORTHEAST AUSTRALIAN MARGIN

Summary of Site Objectives:

NEA1 - to determine the composition and origin of the most landward of the Neogene prograding and aggrading units beneath the upper slope terrace, and to define the sealevel signal within them.

NEA2 - to determine the composition and origin of the prograding and aggrading units beneath the outer part of the upper slope. This hole, in conjunction with NEA1 will calibrate the abrupt seismic facies variations evident on the seismic lines.

NEA3 - to determine the nature of the most distal portions of the progradational and aggradational units beneath the upper slope terrace. To determine the age and origin of the 8 seismic sequences at this site. This hole, in conjunction with NEA1 and 2 will allow investigation of a complete toe-of-slope to basin transect of this continental margin.

NEA4 - to define the relationship between lower slope carbonate fan facies and the more proximal facies found at sites NEA1-3, and to relate that to the sealevel signature extracted from sites 1-3.

NEA5 - to obtain a complete basinal section for paleoceanographic history and to correlate basin fill response between the continental margin and the Queensland Plateau.

NEA6 - to understand slope processes in an exclusively carbonate system and to determine the age of the reef platform and timing of the onset of pelagic sedimentation. To determine the sealevel, oceanographic and climatic control in the Plio-Pleistocene periplatform sediments shredding off the western margin of the Queensland Plateau.

NEA8 - to obtain the periplatform sequence and the sealevel and paleoceanographic signals for comparison with NEA1-3. To determine the origin of the topmost reef horizons.

NEA9A- to determine the composition and origin of the slope units immediately seaward of the Neogene carbonates of the Queensland Plateau. Compare history and processes with equivalent age sequences on the continental margin, sites NEA1-3.

NEA10A- to determine origin of platform top carbonates, history of drowning, and paleoceanographic signal of overlying periplatform ooze.

NEA11- to obtain stratigraphic, and age data to tie event stratigraphy from southern continental margin to Queensland Plateau. To obtain paleoceanographic data on the change from temperate to tropical climates as Australia drifted north during the Neogene. To determine the origin and age of carbonate deposition on the Queensland Plateau.

NEA13 - to determine the nature and age of the carbonate facies in the Marian Plateau and to determine the cause(s) of their demise.

NEA14 - to establish the composition and age of the forereef sediments, the downlapping and onlapping sediments that overlie the platform, and to establish the cause and timing of the demise of the platform. To determine the age and composition of the pre-reef sediments.

****WATCHDOG REPORT****

DRILLING PROPOSALS IN THE JUAN DE FUCA/GORDA RIDGES
Miriam Kastner and Mark Langseth

Relevant proposals:

Proposal 284: Drilling in Escanaba trough, Southern Gorda Ridge, Zierenberg et al. July 1987.
Addendum: Proposal 224: Additional sedimentation and geochemical studies on Middle Valley sediments, and responses to lithosphere panel concerns.

Proposal 232: Drilling into high temperature zero-age crust in Middle Valley, on the Northern Juan de Fuca Ridge. Main proposal Davis et al. May 1986.
Addendum: Clay mineralogy and geochemistry of hemipelagic sediments under hydrothermal influence in Middle Valley.... Blaise et al. March 1987.

Proposal 290/E: Deep drilling on Axial Seamount: Central Juan de Fuca Ridge, Johnson et al. No date.

ESCANABE TROUGH DRILLING:

Seven single bit holes at three sites are proposed in the southern, thickly sedimented end of the Gorda Ridge, north of the Mendocino Fracture Zone. DSDP Site 35 was drilled just north of the Mendicino F.Z (south of the proposed sites), and penetrated 390m of hemipelagic sediment of which 95 m were recovered.

Proposed site 1 is a reference hole through the sediment into basement in an area away from volcanic or hydrothermal structures. Hole 2A,B,C and 3 A,B,C are placed to penetrate the summit and near the base of 100m high hills with flat tops and thick sedimentary caps. These structures are enigmatic, they appear to have been punched up through the sedimentary cover from below. Drilling will examine the structure of these hills and the massive sulfide deposits found skirting the bottom of the hills.

Questions:
1. Why drill both sites 2 and 3? since the structures in the NESCA and SESCA areas appear to be very similar.

2. The proposal does not address the high temperatures that will be encountered during the drilling. Heat flow measurements in the Escanaba Trough (Abbott et al., 1986) show isolated very high values up to 1.8 W/m 2 , with an estimated gradient is of 1.5 to 2.0 degrees per meter. Thus, temperatures could reach 200 deg. C just 100m below the sea floor. Most of the measurements range from 300 to 400 mW/m 2 , or gradients of 30 to 40 degrees per 100m. Existing heat flow measurements are not close enough to the proposed drill sites to predict subseafloor temperatures.

3. The proposers realize that the existing site survey data are not adequate. Detailed single channel seismic, deep-towed side scan, detailed heat flow around the drill sites are essential. MCS traverses of the ridge are desireable.

General, in principle the Escanaba Trough is an excellent region to explore the regime of a thickly sedimented, active spreading center. It seems to have some features that Middle Valley does not have, e.g. the punch up hills and the associated mature sediment-hosted massive sulfide deposits. The location of the active spreading center is better defined than at Middle Valley. However, the geology and geophysical survey data in the Escanaba Trough are meager compared to Middle Valley.

No active venting has been observed during dives in the area, and mature hydrothermal systems have been studied on land. Questions about hydrothermal processes are better addressed in an active system in which the relationship between chemical evolution of fluids and alteration of rocks and sediments, and the chemistry and mineralogy of the sulfide deposits can be monitored and characterized. The objectives and rationale for drilling in Escanaba Trough, as presented in the proposal, are too narrowly focused. There is time to improve the survey information and the proposal.

Reference:
Abbott, D.H. J.L. Morton and Mark L. Holmes, Heat Flow Measurements on a hydrothermally active slow spreading ridge: The Escanaba Trough, Geophys. Res. Ltrs, 13 pp678-680, 1986.

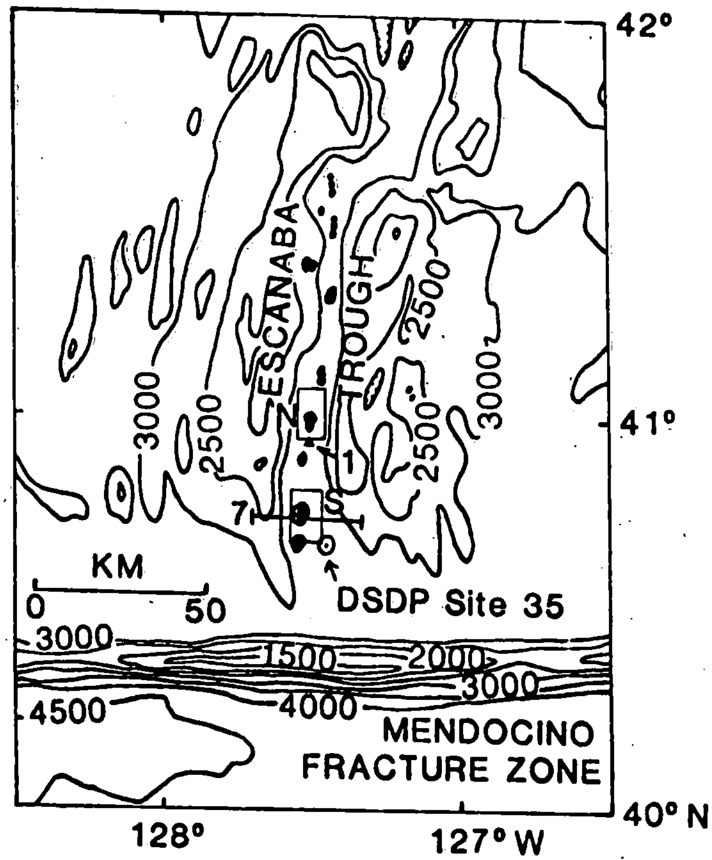


FIGURE 3

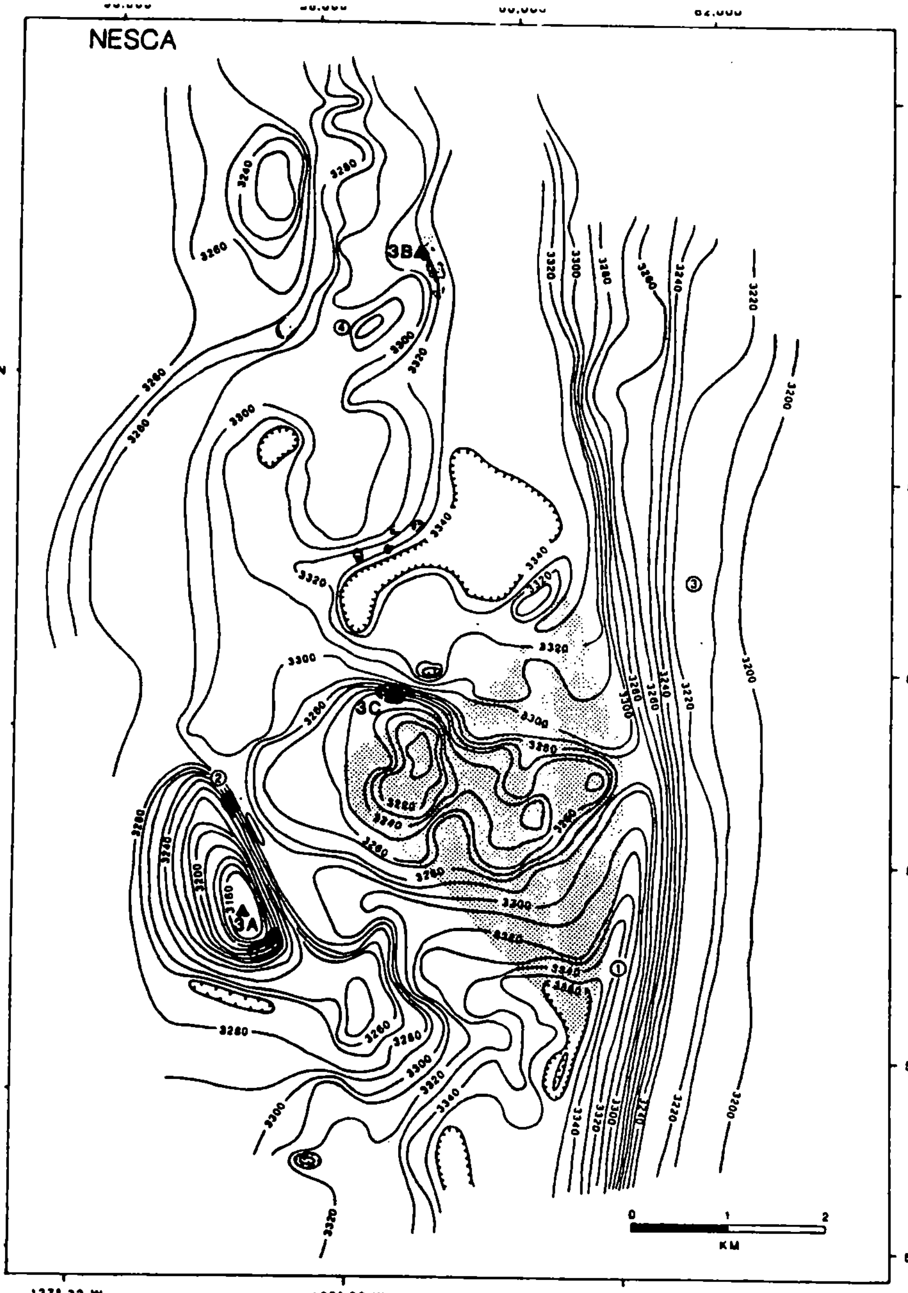


FIGURE 5

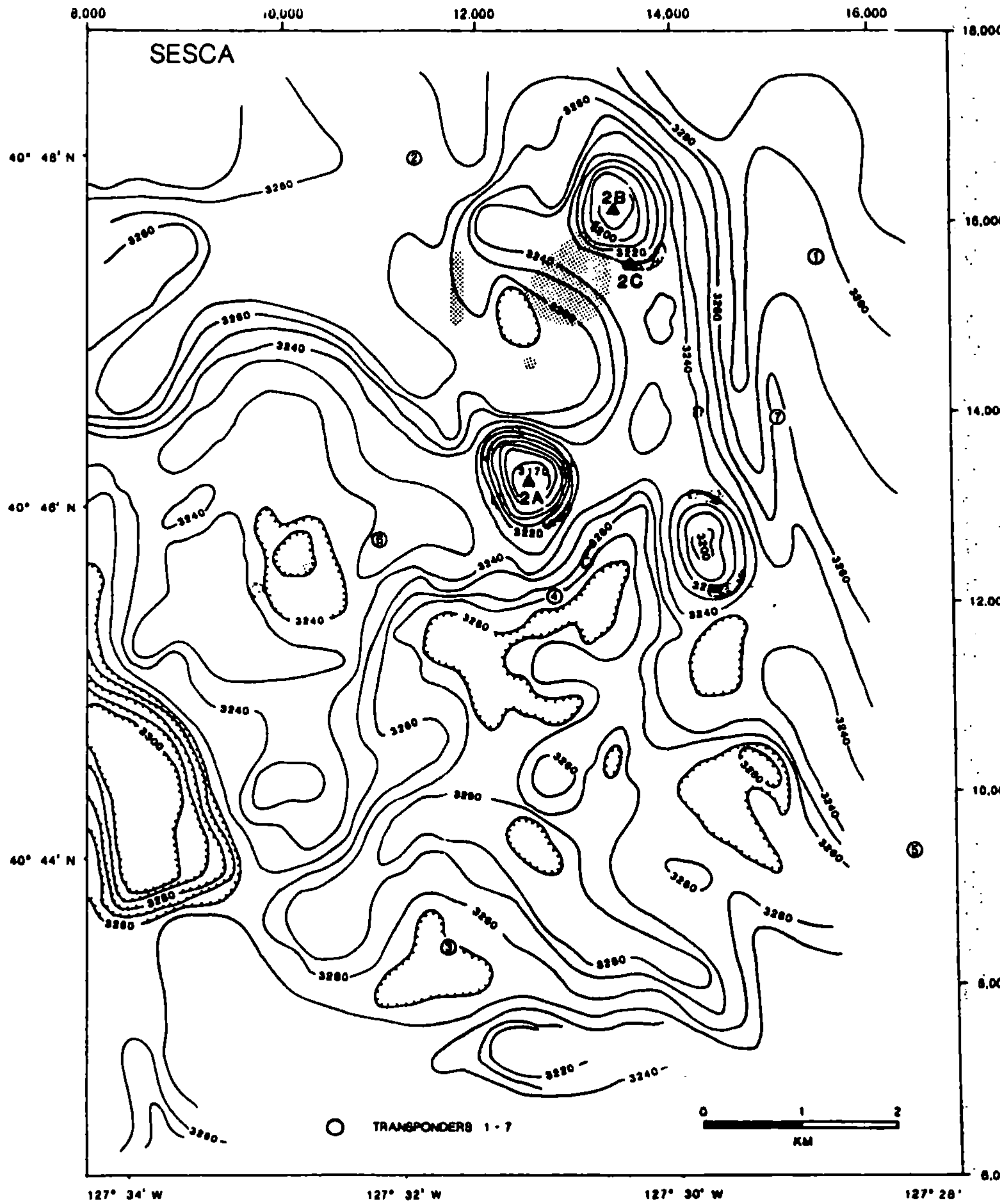


FIGURE 6

MIDDLE VALLEY DRILLING: JUAN DE FUCA RIDGE

The Davis proposal is a model drilling proposal. Concise yet sufficient for the purpose!

Middle Valley is a large, turbidite-filled rift valley in the Northern Juan de Fuca Ridge. It lies near the center of the Bruhnes Magnetic anomaly indicating that the valley floor is geologically very young. There has been debate in the past whether zero age crust lies below Middle Valley. A negative excursion in magnetic intensity near the center of the valley may result from shallow high temperatures, and perhaps recent magmatism.

Middle valley has been extensively surveyed. A high density geothermal survey indicates a heat flow varies inversely with sediment thickness, between 200-700 mW/m 2 , and temperatures at the sediment/basement interface of 100 to 400 O C are predicted.

On the East side of the Valley hydrothermal fluids penetrate through the sediment and form a large mound of hydrothermal material. One massive sulfide deposit has been cored in this part of Middle Valley.

Two multihole drill sites to be done on a single leg are proposed: Site 1 is near an active hydrothermal seep, where sediment is about 300m thick, three holes will be cored with HPC/XCB to basement. One of the holes will be deepened 100m into basement.

Site 2 is near the center of Middle Valley where sediment is about 400m thick. Three APC/XCB holes will be drilled to basement. Two of these holes will be deepened 300m into basements. These holes will be close together to allow hole-to-hole experiments. The basement holes will be prepared for later re-entry for downhole experiments and measurements.

The proposal lists eleven objectives that include studies of biology, paleo-oceanography, clay mineralogy, geochemistry, lithology and diagenesis and catagenesis in a high temperature environment, a sealed, axial hydrothermal system and sampling of zero age crust.

Middle valley has been surveyed in detail using a wide variety of geophysical and geological techniques. Hoever it is important to map geochemical gradients in the porewater of sea floor sediments to estimate actual flow rates involved with the hydrothermal flow.

The Middle Valley drilling program is the best documented and most comprehensive of the Juan De Fuca proposals. Because of the importance of understanding the sedimentary and thermal regime of a thickly sedimented active ridge, and the unique opportunities it presents to sample zero age crust, and penetrate an active hyrothermal system, the middle valley drilling should rank high among all Mid Ocean Ridge targets.

The principle problem will be proper preparation for high temperature drilling and downhole measurements.

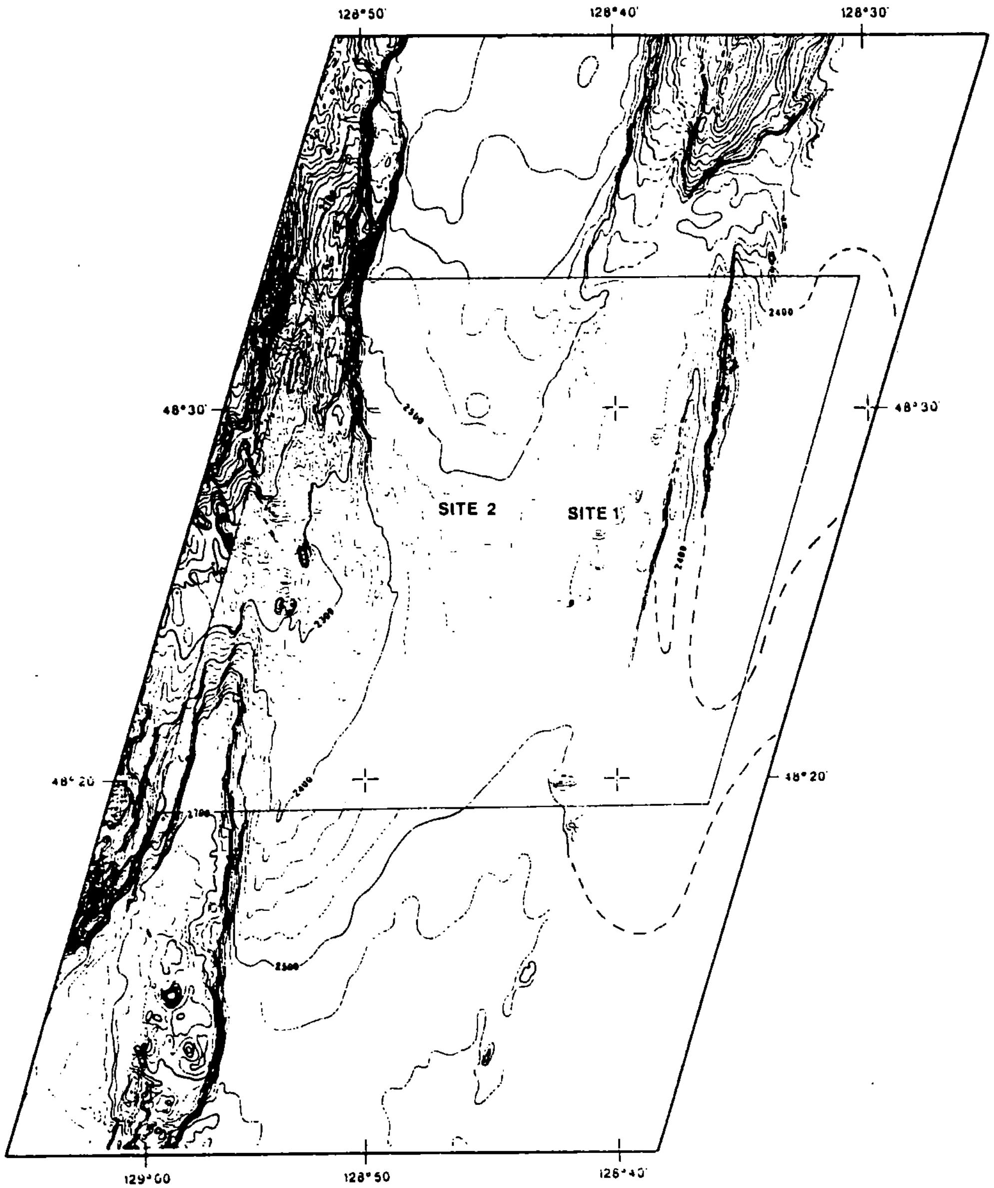
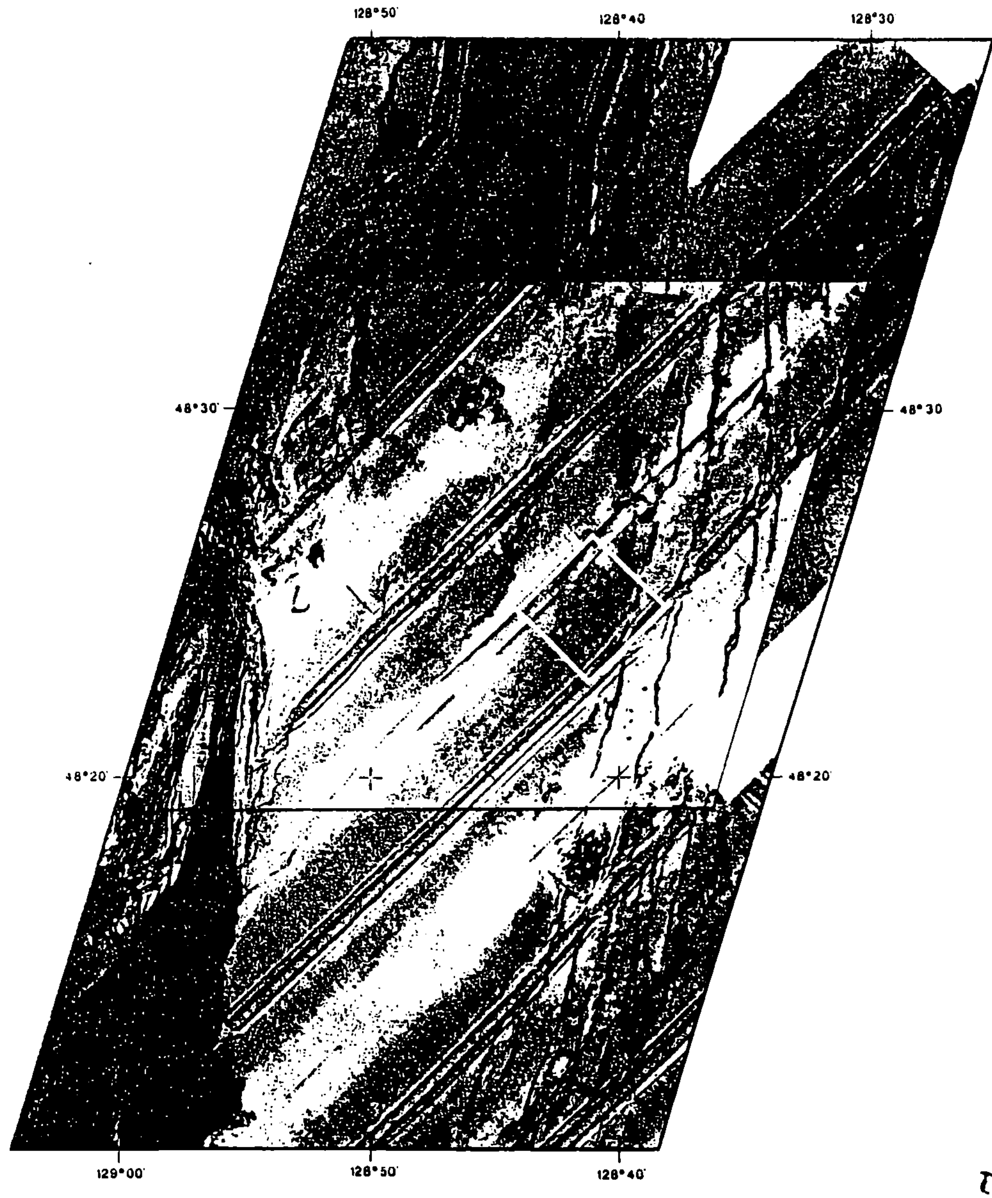

128°50'
128°40'
128°30'
48°30'
48°30'
SITE 2
SITE 1
2400
2500
48°20
48°20'
129°00
128°50
128°40'

FIG. 1


128°50'
128°40
128°30
48°30'
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48°20'
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128°50'
128°40'

FIG. 2

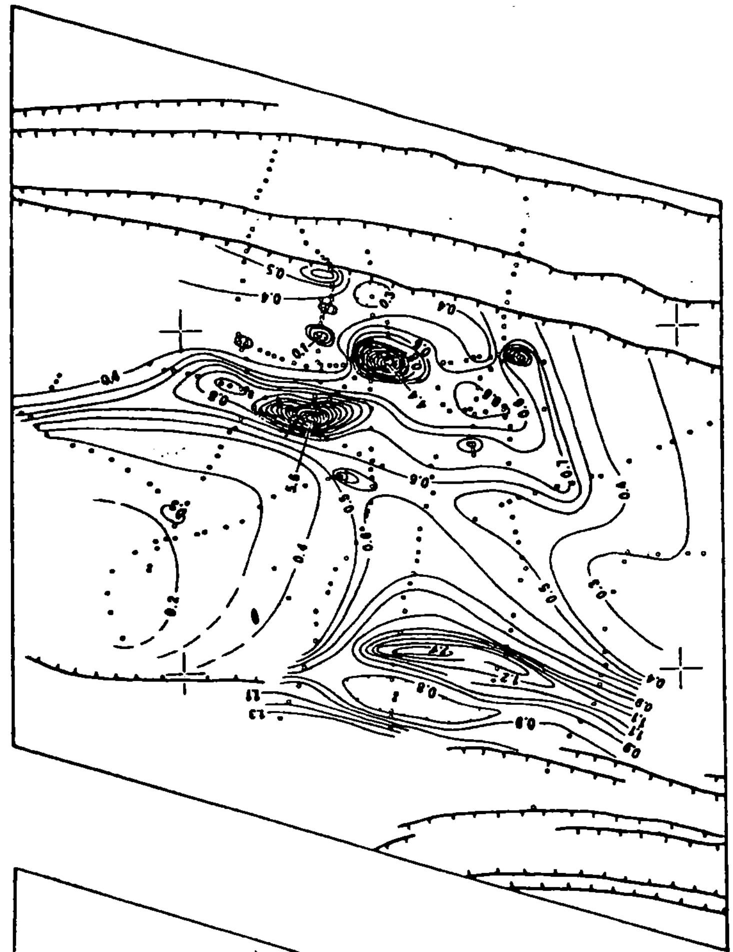


Fig. 5

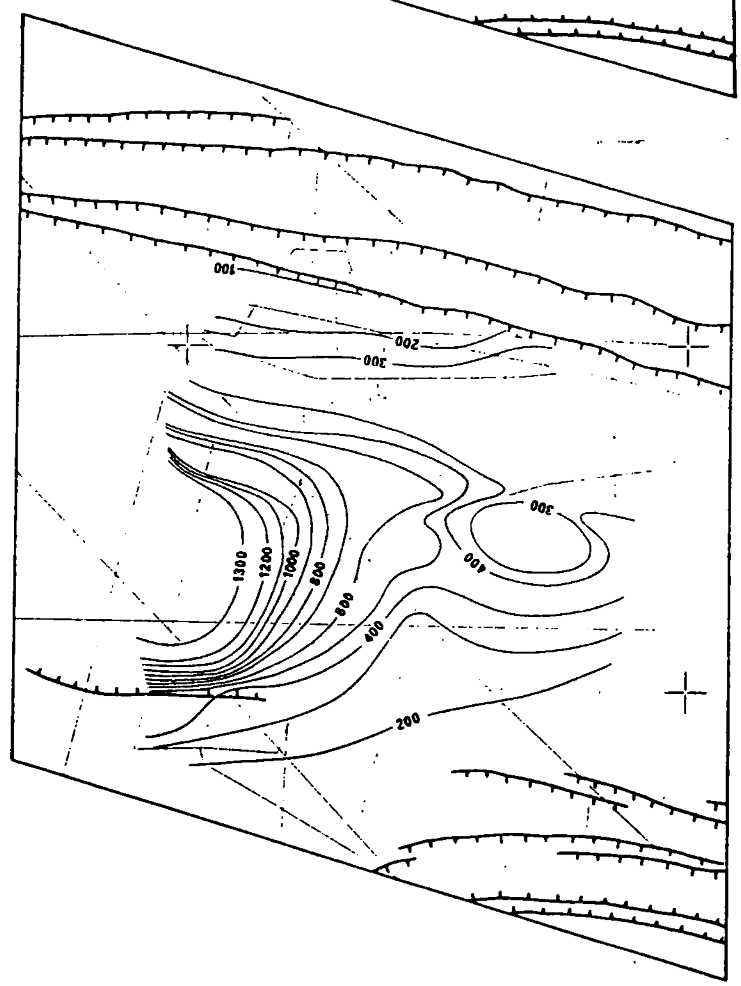


Fig. 4

Fig. 6

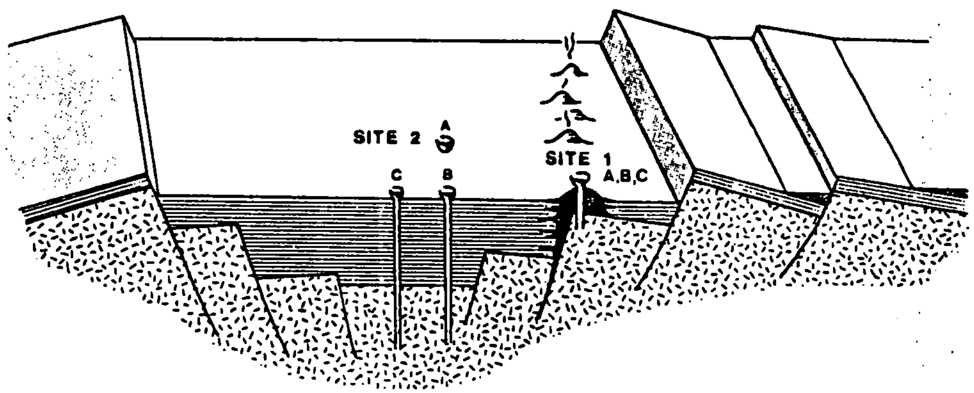


Fig. 9

AXIAL SEAMOUNT DRILLING:

Axial Seamount is an extensively explored Caldera structure that sits astride a small left lateral offset of the Juan de Fuca spreading axis about midway along the length of the ridge segment. The Caldera is defined by a steep horseshoe-shaped escarpment that is open to the south. Active hydrothermal vents have been found near the foot of the walls of the caldera.

A principal objective of the drilling is to examine the internal structure, volcanic stratigraphy, hydrothermal system and petrology of an actively forming volcano on a spreding center axis.

A second objective is to drill into the summit of a recently active, but now extinct off-axis seamount (Brown Bear Seamount) with many of the same objectives. No data on Brown Bear seamount are presented in the proposal.

A third objective is to define the early evolution of Axial Seamount by drilling a hole on the Southeast flank of Axial Seamount to compliment the caldera site.

Proposal 290/E puts forward three possible drill targets:

Site 1. Located in the floor of the caldera near the foot of the bounding e.Grpment where hydrothermal venting and recent magmatic activity has been observed. An objective is to have the hole intersect the stockwork of the active hydrothermal system. It would be exciting to investigate an active volcanic and hydrothermal system in a caldera setting. Drilling at Site 1 will certainly require a barerock guidebase, however it is an attractive drilling target that can probably be achieved in half a leg.

Site 2. Is on the summit of Brown Bear seamount, which only recently became inactive. The objective would be define the structure and petrology of an off-axis seamount and compare it with that at Axial Seamount.

Site 3 A hole on the southeastern flank of Axial Seamount is the third target, which the proposers have given a second priority relative to first two sites.

Sites 2 and 3 should be given a much lower priority than Sites 1 or any of the Middle Valley Sites.

The authors of the proposal report that there are sediment ponds at sites 2 and 3 that could be used to spud in the drill bottom hole assembly. No data are shown to verify this. A large amount of near-bottom, high resolution data have been obtained over Axial Seamount so that the morphology and sea-floor processes are well known. Magnetic and gravity surveys allow broad inferences to be drawn about the subseafloor structure and temperature, the detailed structure below all of the sites is virtually unknown. An MCS and SCS survey over the seamount may provide a clearer picture of the subsurface stucture, but there is no assurance that seismic techniques will define the structures important to optimally locating the holes.

The proposal suggests additional survey work such as near bottom experiments and measurements, that would help delineate the thermal structure, and the foci and intensity of tectonic activity, but these will not be relevant to locating the best drill holes. The subseafloor thermal regime is also unknown and will likely remain so until holes are drilled. The presence of the hydrothermal vents and recent lava flows indicate very high temperatures may be found at shallow depths at Site 1.

One can question whether drilling Axial and Brown Bear Seamounts at this time will teach us much about the deep structure and evolution of an axial seamount. Money would be better spent on near-bottom and on-bottom observations and high resolution imaging. A proposal to drill into an axial seamount may be premature. Much more can be done to define the problem before the drill ship is called in.

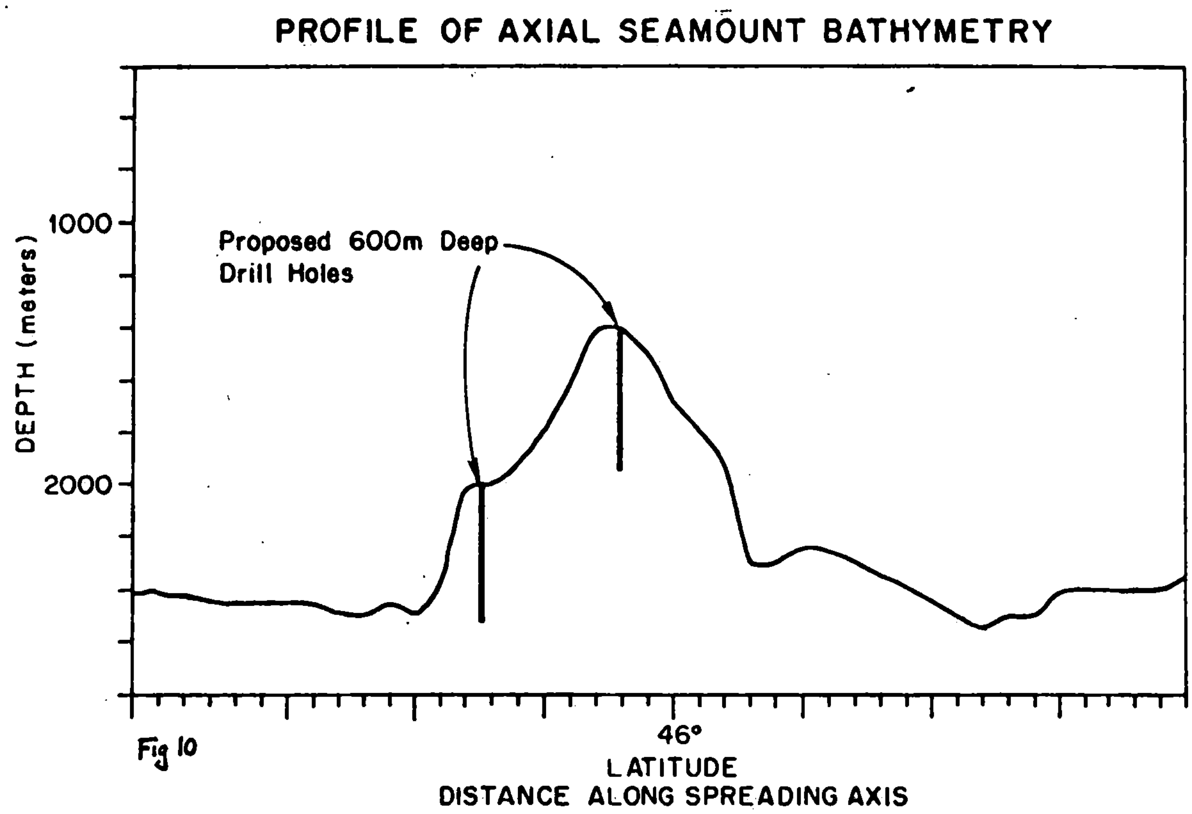


Fig. 10. Bathymetric profile over Axial Seamount (left to right is south to north), showing the relative penetration into the seamount of two 600 meter drill holes, one in the caldera and one on the outer flank.

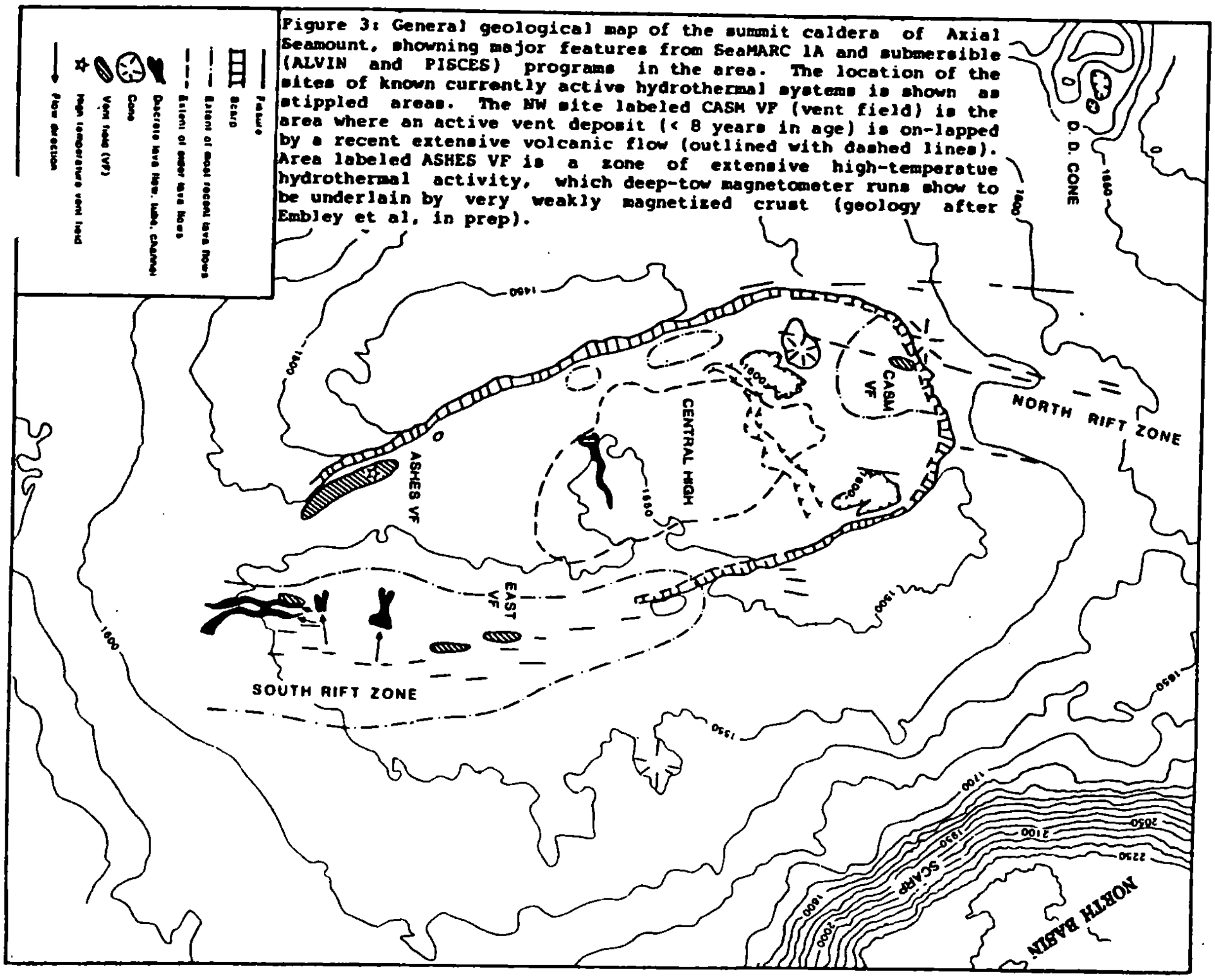


Figure 3: General geological map of the summit caldera of Axial Seamount, showning major features from SeaMARC 1A and submersible (ALVIN and PISCES) programs in the area. The location of the sites of known currently active hydrothermal systems is shown as stippled areas. The NW site labeled CASM VF (vent field) is the area where an active vent deposit (< 8 years in age) is on-lapped by a recent extensive volcanic flow (outlined with dashed lines). Area labeled ASHES VF is a zone of extensive high-temperatue hydrothermal activity, which deep-tow magnetometer runs show to be underlain by very weakly magnetized crust (geology after Embley et al, in prep).

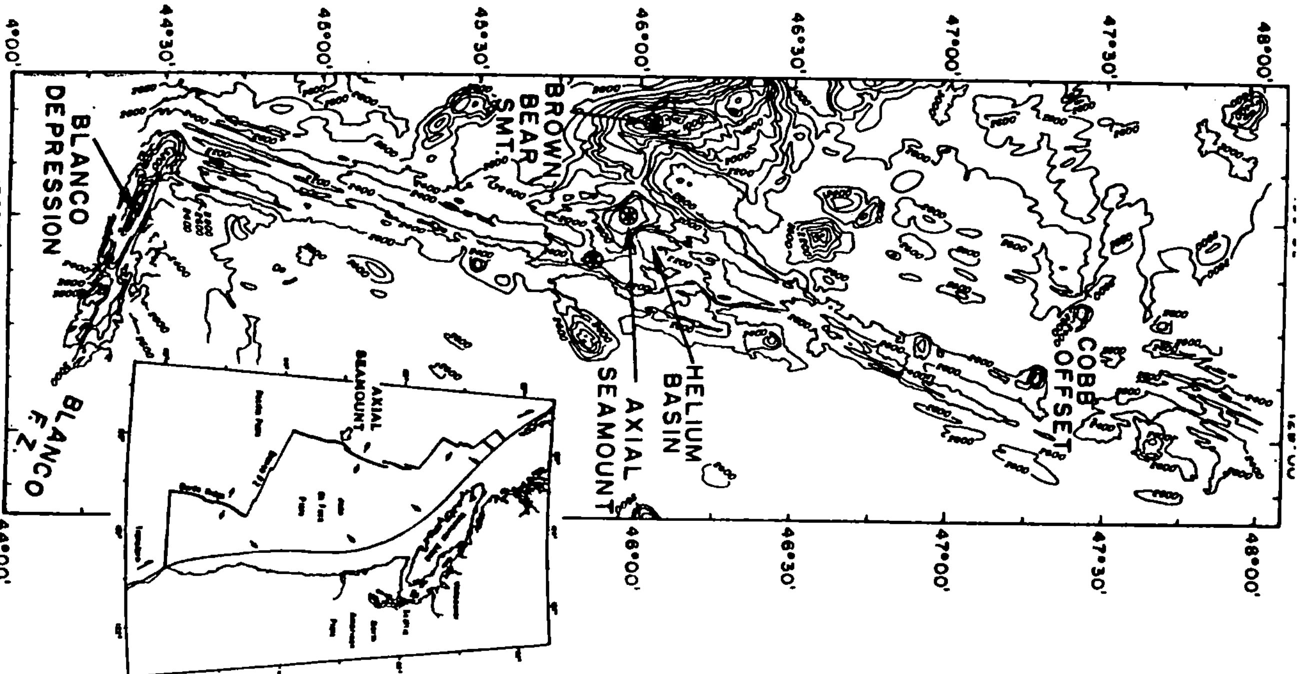


Figure 1: General location map of Axial Seamount on the central Juan de Fuca Ridge. Proposed drilling sites are located in international water, approximately 250 nautical miles west of the Washington-Oregon coast. The stars represent the proposed drill sites on the summit and SE flank of Axial, and the eastern summit of Brown Bear. Axial SEABEAM coverage is adapted from Crane et al., 1985.

Drilling proposal by S.C. Cande: "Southern Chile triple junction". CEPAC Watchdog report from Olav Eldholm.

The proposal addresses the consequences of subducting a spreading ridge and how it effectcs the tectonics of the margin before and after the actual ridge-trench collision. The junction of the Chile Trench and Chile Ridge is suggested as a drilling target because simple and well understood plate geometry and the fact that the change from a pre- to a post collisional setting takes place over only a few hundred kilometers.

Two main scientific problems are raised. First, the nature of the ridge-trench interaction at the present collision zone. It is documented that the process of tectonic erosion is much different here than elsewhere along the trench. However, little is known about the actual collision zone particularly the extent of erosion, the geometry of the accretionary prism, nature of basement and the extent of metamorphism associated with high heat flux. A drilling strategy of two marginal transects is proposed. 1) A transect (B-B', 1-2 holes) directly across the transition zone, 2) another (A-A', 1-2 holes) 100 km to the north as a reference line for the margin in a non-eroded area.

The second problem deals with the character and the effects of the Neogene subduction on inner trench wall south of the triple junction. Particularly, Neogene vertical movements of the upper inner wall, nature of basement below the outer arc ridge and beneath the upper slope basins (Paleozoic metamorphics?), and how the collision relates to the evolution of the Madre de Dios sedimentary basin on the shelf/upper slope. Again two transects are suggested. One (profile 10) to sample the inner wall where collision occurred 10 my with little apparent deformation (2 holes). Another (profile 7) closer to the triple junction (6 my) to drill the outer arc ridge and upper slope (2 holes).

Finally, the possibility of drilling recently sediment covered "zero-age" crust is raised.

Priorities. High: Transect line 10, transect B-B'. Middle: transect A-A'. Low: Transect line 7, "zero-age" crust.

Evaluation: I find it a somewhat difficult task because the proposal (submitted in 1984?) is based on two preprints (Cande & Leslie, in press) which I did not had access to. Moreover, I do not know the status of more recent work, if any. Basically, it appears a sound proposal addressing an important problem in a well-defined geologic setting. The transect strategy also makes sense. On the other hand, I feel that the present site documentation is inadequate for actual site location and that more detailed surveying is needed prior to a final decision. Too little geophysical documentation exists to recommend drilling "zero-age" crust.

Recommendation: Stress the need for site surveying and/or additional site documentation. Evaluate if any of the targets are covered by other active margin drilling programs.

JOIDES Lithosphere Panel Meeting
Hawaii Institute of Geophysics
Univ. of Hawaii, Manoa
Honolulu, HI
2 March - 4 March 1988

EXECUTIVE SUMMARY

1.0 Evaluation of Proposal to Return to Site 735B (SWIR)

LITHP does not endorse a return to Site 735B at the present time. The panel was not convinced that the main stated objective of drilling Moho could be achieved in a single leg. There was also concern that this site will yield results representative of only one extreme end member of the accretionary spectrum and not "normal" oceanic crust. In terms of LITHP's long-term, global priorities, we would prefer drilling a site in a similar tectonic setting in the North Atlantic.

2.0 WPAC Planning

2.1 Geochemical Reference Holes

LITHP considered whether additional reference hole drilling could be integrated with CEPAC proposals and made the following recommendations:

(1) Sites MAR-4, 5 and 6 should be drilled on a single leg to be scheduled during the second year of WPAC drilling in FY90. These three, relatively shallow holes will sample the composition of the sediments entering the Marianas trench, and the summit and volcanoclastic apron of a large seamount typical of those being subducted at this arc.

(2) A second half-leg in the CEPAC program should be devoted to drilling site A2-2 east of the Bonin trench (replacing BON-8) on anomaly M-18. This hole should be drilled ~200m into basement. The second half of this leg should be used either to deepen this hole to 500m or to drill site J5 in the Jurassic Quiet Zone.

2.2 New Proposals

LITHP endorses proposal 298F to acquire VSP profiles in the Nankai Trough.

2.3 Co-chief Nominations

No WPAC co-chief nominations were made since the co-chiefs have apparently already been selected.

3.0 CEPAC Planning

3.1 Engineering Requirements

Engineering development required for CEPAC lithospheric drilling includes: (1) overcoming the rubble problem, (2) deep penetration, (3) high-temperature drilling, and (4) improved (>50%) recovery.

At least two engineering half-legs after 124E will be needed to test and evaluate new hard-rock drilling systems before EPR. At least one of these half-legs should be in the Lau Basin.

Including the engineering legs, at least 4 hard-rock guidebases will be required for CEPAC drilling.

3.2 Comments on PCOM's 18-month CEPAC Program

In order to properly address the scientific objectives of the three LITHP programs included in PCOM's tentative CEPAC schedule, at least 5 1/2 legs of drilling will be required. In addition, the proposed CEPAC program does not include any drilling of young hotspot volcanoes which LITHP considers an essential component of any lithospheric drilling program in the Pacific. Thus in our view, a core LITHP program in the CEPAC area consists of a minimum of 6 1/2 legs:

1 1/2	legs	504B
2	legs	EPR
2	legs	Juan de Fuca/Escanaba Trough
1	legs	Young hot spot volcanism (Loihi, Marquesas)
-----		
6 1/2	legs	

LITHP also supports TECP and SOHP drilling programs in the M-Series/ Jurassic Quiet Zone and on Ontong-Java Plateau since these programs will have some lithospheric drilling objectives.

The following specific recommendations were made on CEPAC lithospheric drilling:

504B
* LITHP favors deviating the hole as the best option for deepening 504B
* We recommend an engineering half-leg at 504B early in the CEPAC program to prepare the hole for further drilling. This should be followed, if hole conditions warrant, by a full leg of scientific drilling.

EPR
* LITHP endorses the EPR Working Group's recommendation that the highest priority should be to drill a single, deep hole into the high-temperature reaction zone immediately above the magma chamber.

* The second priority should be a series of shallower holes (200-500m deep) across the rise axis.

* LITHP also endorses the site selection criteria and survey requirements developed by the EPR Working Group.

* Two legs of EPR drilling is adequate for this phase of CEPAC drilling, provided the engineering development legs proposed above are carried out. We recommend the two legs be separated by a minimum of 12 months.

Juan de Fuca Ridge/Escanaba Trough

* A minimum of two legs will be required to adequately address magmatic/hydrothermal processes, and questions related to ore genesis and sulfide deposition.

* At their second meeting the EPR Working Group should be asked to develop the existing drilling proposals for this area into an integrated drilling strategy for sedimented ridge crests (for this discussion a new working group chairman will be needed).

4.0 Long-Range Planning (1992 and beyond)

LITHP's highest long-term thematic objective is to determine the structure of the oceanic crust and how it forms. Mid-plate and convergent margin processes are important, but lower priority objectives.

Addressing LITHP's long-term thematic objectives will require drilling along two or three spreading ridges (slow and fast, sedimented and unsedimented), as well as one or more deep, crustal penetration holes off-axis on older crust.

The best locations for carrying out this drilling will be in the eastern Pacific (eg. EPR, Juan de Fuca Ridge) and in the North Atlantic (eg. MARK, Reykjanes Ridge). Thus, in the post-1992 time frame, LITHP sees its highest priority drilling objectives located primarily in the eastern Pacific and North Atlantic.

5.0 Other Matters

LITHP endorses LFASE at DSDP 417D/418A, but urges close collaboration with the TAMU engineers to minimize the risk to Hole 418A.

LITHP endorses the recommendations contained in the preliminary report of the PCOM Subcommittee on changes to the JOIDES Panel Structure.

Julian Pearce was appointed the new WPAC liaison.

The next LITHP meeting was tentatively scheduled for 12-17 Sept. in Corner Brook, Newfoundland. John Malpas will serve as host.

JOIDES Lithosphere Panel Meeting
Hawaii Institute of Geophysics
Univ. of Hawaii, Manoa
Honolulu, HI
2 March - 4 March 1988

Members present:

R. Detrick (URI), Chairman
K. Becker (RSMAS)
K. Bostrom (ESF)
L. Cathles (Cornell)
H. Elderfield (UK)
T. Fujii (Japan)
J. Malpas (Canada)
M. McNutt (MIT)
C. Mevel (France)
J. Orcutt (SIO)
J. Pearce (UK)
M. Perfit (U. Florida)
N. Peterson (FRG)

In attendance:

E. Davis (CEPAC)
M. Fisk (SOP)
M. Kastner (PCOM)
S. Howard (TAMU)
J. Karson (ARP)
S. Scott (WPAC)

Absent:

R. Batiza (Northwestern)
S. Humphris (WHOI)
R. Duncan (IOP)
P. Robinson (PCOM)
J. Mutter (L-DGO)

AGENDA

1. Liaison Reports
2. Leg 118 Summary; Return to SWIR?
3. WPAC Planning
4. CEPAC Planning
5. Discussion of COSOD II recommendations
6. Long-range planning (1992 and beyond)
7. Other matters
   DSDP 418A and Wireline Acoustic/Seismic Exp.
   Panel advisory structure; liaisons
   Next Meeting

MINUTES

The meeting began shortly after 9 am with the introduction of several new panel members and the approval of the previously distributed meeting agenda.

1.0 Liaison Reports

1.1 PCOM (M. Kastner)

M. Kastner reported on the results of the last PCOM meeting in Sunriver, Oregon:

1.11 Engineering development

* PCOM emphasized the importance of improving communication between PCOM, the advisory panels and the TAMU Engineering Development Group. PCOM has appointed two "engineering watchdogs" (T. Francis, M. Langseth) to monitor engineering development efforts. An engineering liaison will be assigned to the thematic panels; for LITHP that liaison will be Steve Howard. There was a consensus on PCOM for scheduling one meeting per year at College Station to encourage exchange with the engineering group.

* PCOM has set aside 4% of the ODP operating budget for "special" projects; at least half of this amount is earmarked for new engineering development.

* PCOM has approved a 30-day engineering "half-leg" (Leg 124E) for testing and evaluation of new engineering systems. TAMU will present a proposal outlining what will be done on this leg to PCOM in April. Tools developed both inside and outside ODP/TAMU may be tested. Two more engineering "half-legs" may be scheduled later in the WPAC program after the Japan Sea legs and in the Lau Basin.

* Panels need to provide PCOM with long-term engineering development needs and leg-by-leg engineering requirements

1.12 Wireline logging

* Time estimates for standard Schlumberger logging on ODP legs should be based on three tool string runs without sidewall entry sub deployment.

* PCOM approved $160K for purchase of the Schlumberger formation microscanner; will be ready in about 11 months.

* PCOM approved testing of a wireline heave compensator for JOIDES RESOLUTION.

1.13 WPAC

* PCOM approved the first year of drilling for WPAC consisting of the following seven legs: Banda-Sulu-Celebes-South China Sea, Marianas-Bonin diapirs, Bonin Transect, Nankai accretionary prism, and two Japan Sea programs. Co-chief nominations are requested for the two Bonin legs, the Nankai, and Japan Sea legs.

* PCOM is considering 1 leg of reference hole drilling in the second year of the WPAC program; would like LITHP input on whether additional reference hole drilling could be integrated with CEAPC proposals to drill M-series anomalies or in the Jurassic Quiet Zone (285/E, 287/E).

* PCOM accepted LITHP recommendations on Lau Basin drilling

1.14 CEPAC

* For planning purposes, PCOM has drawn up an 18-month CEPAC drilling plan which it is sending back to the thematic panels for comment. This plan includes four LITHP legs (504B, EPR, and sedimented ridge crests), three SOHP legs (Neogene paleoenvironment, Mesozoic paleoceanography, Anoxic events), and two TECP legs (lithosphere flexure, ridge-trench interactions).

* PCOM would like feedback on what we can and can't achieve with this amount of drilling time in CEPAC and alternative programs in the event the highest priority programs cannot be drilled.

* PCOM approved the establishment of an EPR Working Group. Earl Davis (PGC) agreed to chair this committee.

* PCOM established "watchdogs" for the LITHP legs: 504B - John Malpas, EPR - T. Francis, Juan de Fuca - M. Langseth/M. Kastner.

1.15 Panel Advisory Structure

PCOM established a subcommittee consisting of Francis, Taira, Langseth and Heath to recommend changes to the present panel advisory structure. Their final report will be presented to PCOM in April. Preliminary recommendations include; (1) splitting SOHP into two panels, one for Ocean Paleoenvironment and Paleobiology, and the other for Diagenesis and Sediment Processes; (2) phasing out the regional panels and replacing them with ad-hoc Detailed Planning Groups focussed on specific thematic objectives; (3) external review of mature drilling proposals; (4) creation of a Shipboard Measurements Panel to oversee geochemical, geotechnical and other shipboard analytical techniques and capabilities.

1.16 ODP Publications

* ODP will continue to publish Vol. B, despite problems with it being considered "grey" literature. A five-person editorial board (2 co-chiefs, 1 TAMU editor, TAMU staff scientist, 1 outside scientist) will obtain external reviews and make publication decisions. The volume will

continue to be typeset, but no routine editing will be done except for non-English speaking authors. Figures must be camera-ready; no color plates unless paid for by the authors. Reprints will be limited to 50 per author.

* TAMU will try to identify "non-performers", especially co-chiefs, in order to insure that they do not participate on future ODP legs.

1.2 NSF Report (B. Malfait)

ODP has been approved through 1993; the drilling program for 1989-1993 will be reviewed this year. JOI has a budget of $35.5M for FY88 - $20.5M from NSF and $15M from the six international partners. Budget projections for the remaining years of the 10-yr program are:

FY 1989	$36.0M
1990	38.0M
1991	39.0M
1992	40.0M

These budget projections assume no new foreign partners; some increase in the partner contributions are assumed for FY90-92. Four percent of each annual budget will be set aside for "special" operations (guidebases, ice boats, mine coring system development etc.). Approximately half of this set aside and most of the annual budget increases are to be devoted to engineering development.

In FY88 NSF will support six drilling-related field programs and part of one other program. The plans to change to a more thematically driven program will not effect ODP funding of regional surveys as long as plans are made 3-4 yrs in advance.

1.3 WPAC Report (S. Scott)

As noted in the PCOM report, a six leg WPAC program has been approved for FY89 including an engineering half-leg in the Marianas Trough. Leg 124 (Banda/Sulu/SCS) is already in jeopardy because of clearance problems for drilling in Indonesian waters. Alternative sites may be proposed, but site survey data may be insufficient.

The Sunda program has been removed from the WPAC program because of lack of interest from TECP and clearance problems.

1.4 CEPAC Report (E. Davis)

CEPAC has not met since our joint meeting in Paris last Fall. They have prepared a 22-leg preliminary prospectus, part of which was distributed to the panel. CEPAC requests LITHP input on the following questions:

1) Are we satisfied with the 9-leg CEPAC drilling program proposed by PCOM? Does this decision affect our panel's drilling priorities?

2) Should a full leg be devoted to 504B, or should part of the leg be used to deploy guidebases at the EPR?

3) What is the favored engineering strategy for 504B?

4) Should the strategy developed by the EPR Working Group be followed?

5) Is a similar working needed to devise a drilling strategy for sedimented ridge crests?

6) LITHP input is needed regarding sitting of holes and basement penetration for SOHP Ontong-Java program and TECP/SOHP Old Pacific drilling.

Dave Rea is the new CEPAC chairman.

1.5 DMP (K. Becker)

USSAC will be sponsoring logging schools at the annual GSA meeting and at the Fall AGU meeting (Sunday before AGU) later this year. There will also be a special AGU session on ODP logging results, and a special JGR issue being organized by K. Becker. It was also noted that Brass and Kastner will be organizing a workshop on chemical logging.

2.0 <u>SWIR - Results from Leg 118 and Proposal to Return to 735B</u>

2.1 Scientific Results from Leg 118

Kier Becker summarized for the panel the results from Leg 118. The original objective of this leg was to drill directly into the upper mantle in the Atlantis II fracture zone where abyssal peridotites appear to be exposed at the sea floor. The highest priority site was on a median ridge within the transform valley. Several test spud-ins on this feature were unsuccessful, apparently due to a surficial rubble layer, and the site was abandoned. Several alternative sites were also occupied without success before the guidebase was finally deployed on a shallow platform in about 700m of water on the eastern rim of the Atlantis II fracture zone. This 11 my old site, which was not in the original prospectus for the leg, appears to be a wave-cut platform that exposes foliated and massive gabbro locally covered by sediment drifts.

The guidebase was set in about 26 hrs. In sixteen days of drilling 500m of gabbro were drilled with a remarkable **average** recovery rate of 87%. With the exception of one fine-grained diabase dike, all the rocks drilled are gabbros or metagabbros. Six separate lithologic units were recognized of olivine and Fe-Ti oxide-rich gabbro. Layered troctolites drilled near the bottom of the hole represent an early stage of the differentiation of mid-ocean ridge basalt and could indicate the hole is near the base of layer 3. Tectonically, the entire section drilled at 735B is a single coherent unit largely restricted to amphibolite facies metamorphism.

A complete suite of downhole logging measurements were made at this site. The entire hole was associated with very low porosities and surprisingly low temperatures. The layering in many of the gabbroic units was evident in the resistivity logs. A borehole packer experiment indicated low permeabilities below about 272 mbsf, with higher values above this depth. Compressional wave velocities are in the range of 6.5 to 7.0 km/s measured both in situ and on rock samples. A VSP experiment indicates a strong reflector ~500 m below the bottom of the hole.

2.2 Evaluation of Proposal 300/B - Return to Site 735B

The panel next considered a proposal submitted by Dick et al. to return to Site 735B before the drillship leaves the Indian Ocean later this year. The proponents argue that this site represents a unique opportunity to core the crust-mantle boundary where it has been uplifted and unroofed of layer 2 during the formation of the eastern fracture zone transverse ridge. Based on previous drilling at this site they expect 5-6 weeks of drilling could deepen this hole 1-2 km and "in all likelihood penetrate the oceanic mantle". Because of the importance of the structure of the lower oceanic crust to our understanding of the crustal accretion process, they argue this drilling should not be delayed until the ship returns again to the Indian Ocean.

The panel discussed this proposal at length. There was considerable excitement over the success of drilling at Site 735B and the potential significance of the results from this hole. The importance of the petrologic questions that could be answered by a section drilled through the base of the crust into the upper mantle was also clearly recognized by the panel. However, in evaluating this proposal the panel considered four critical questions: (1) What is the probability of achieving the stated goal of drilling into the mantle at this site? (2) How representative will this section be of "normal" oceanic crust? (3) Is this the best location to carry out this kind of drilling? (4) How does this drilling fit into longer-term LITHP global drilling priorities (discussed in part on Friday morning)?

(1) **Probability of drilling into the upper mantle.** The panel felt that a convincing case was not made in the proposal that Moho was achievable in a single leg. The VSP reflector noted in the proposal could have any one of several origins, and is not necessarily indicative of the crust-mantle boundary. It was noted that if the Moho is as shallow as the proponents claim, the transverse ridge should be associated with a free-air gravity anomaly of >1000 mGal. Gravity data were collected as part of the pre-drilling site survey, but none are shown in this proposal. Several panel members observed that in ophiolites the cumulate layering is frequently repetitive and the troctolites found in Unit 6 are not necessarily indicative of Moho. The cumulate gabbroic section could itself be 3-4 km thick. Recent seismic studies of transverse ridges along slow-slipping transforms in the North Atlantic (Vema, Kane, Charlie Gibbs) do not indicate these features are associated with exceptionally thin crust; Moho is found at approximately normal depths beneath these ridges. Unfortunately, comparable data are not available from the AII fracture zone, but given what is presently known the panel was not convinced that the main stated objective of this proposal could be achieved in 5-6 weeks of additional drilling, even if drilling conditions remained as optimal as they were on Leg 118.

(2) How representative will this section be of oceanic crust? Another question raised by the panel was how representative a hole at this site would be of "normal" oceanic crust. SWIR is in a relatively anomalous tectonic setting at the very slowest end of the accretionary spectrum along a ridge system dominated by horizontal shear. Although drill holes in this kind of environment will ultimately be valuable in understanding the range of accretionary processes, there is some doubt as to how far results from this site could be extrapolated to magmatic systems operating along more "normal" ridge segments. The proponents argue this site is representative of normal crust, but lacking detailed surface geological mapping and regional geophysics this assertion is difficult to evaluate. It was also noted that the absence of a basaltic section at this site, although an advantage in drilling, will make it impossible to study all three components of the magmatic system (extrusives, intrusives, and depleted source material) at this site leaving magmatic models somewhat unconstrained. Thus in the view of the panel, further drilling at Hole 735B will yield results that are representative of only one extreme end of the accretionary spectrum and will not necessarily answer many of the fundamental questions driving deep crustal drilling.

(3) Is this the best location to carry out this kind of drilling? The success of drilling at Hole 735B does suggest a new strategy for deep crustal drilling in which thinner crust near fracture zones can be used as a window into the lower crust. As the proponents correctly point out, it may be years before the technology is available to drill through a complete crustal section, and in the interim drilling proximal to fracture zones, despite their anomalous tectonic setting, may be the only way of sampling the deeper levels of the oceanic crust. If Hole 735B were the only place in the world where this type of drilling could be carried out, then a strong argument could be made to do this drilling now, before the ship leaves the Indian Ocean. However, several panel members noted this is not the case. Gabbros are routinely found exposed at shallow crustal levels along plate boundaries accreting at velocities of less than 15 mm/yr, and at the Oceanographer and Kane fracture zones these exposures occur in a tectonic setting directly analogous to Site 735B. However, unlike SWIR these sites are located in well-studied areas which already possess a wide spectrum and geological and geophysical data at a range of scales. SWIR is totally lacking of this kind of integrated, geological and geophysical database within which to interpret the drilling results. Given its remote location, it is unlikely that SWIR will obtain this kind of high resolution data anytime soon. From this perspective, as well as the availability of the drillship, the North Atlantic is probably a far better area to carry out this kind of drilling.

(4) Role of 735B in long-term, global LITHP priorities. Both COSOD I and II endorsed the concept of "natural laboratories" in which drilling is only one component of a long-term program of multidisciplinary investigations aimed at understanding how accretionary processes vary temporally and spatially. Developing meaningful three-dimensional models of accretionary systems in these areas will almost certainly involve drilling not just one hole, but a suite of holes both along and across-strike. Given our limited drilling resources, these natural laboratories will be few in number and must be carefully selected to be representative of a range of accretionary environments. Because of its remote location and relatively anomalous accretionary environment, it is unlikely that SWIR will be chosen as one of these natural laboratories. Thus Hole 735B is likely to remain a hole in isolation, lacking for the foreseeable future, the complementary investigations and drilling that will be devoted to other areas along the Mid-Atlantic Ridge, EPR or Juan de Fuca Ridge. While this should not necessarily preclude future drilling at Hole 735B, it would be preferable if this type of drilling could be carried out as part of one of the established natural laboratories. Thus in terms of our panel's long-term, global drilling priorities SWIR does not rank high, despite the justifiable excitement over the drilling results from Hole 735B.

Based on the discussions summarized above, the consensus of LITHP was <u>not</u> to endorse a return to Hole 735B before the drillship leaves the Indian Ocean later this year.

2.3 Engineering Results from Leg 118

Steve Howard summarized for the panel the engineering results from Leg 118 and their impact on future hard-rock drilling.

* downhole motors were successful in spudding holes, but core recovery was very low in unconsolidated rubble

* SEDCO is now confident about deploying the guidebase; core recovery jumped from 2% to >35% after the guidebase was set; better recovery was also obtained when drilling was switched from the coring motors to the top drive

* 20-30 hrs of bit life can be expected in competent formations like those encountered at 504B or 735B; in young, fractured basalt like at 648B bit life drops dramatically (~8 hrs)

* average penetration rates are comparable at 504B, 735B and 648B (1.8-2.6 m/hr) indicating that these rates are not formation dependent

* average recovery rates at 735B were substantially higher (~90%) than at either 504B (24%) or 648B (12%) probably reflecting the massive, unfractured character of the gabbroic rocks

* the success in Hole 735B should not obscure the fact that major problems still exist with drilling in young, fractured rock; also problems exist with drilling and recovery rates in 504B that may require new crustal drilling technology

There was some discussion of new bit designs as a means of improving recovery rates. Howard noted that on Leg 118 a large-kerf diamond bit was tried, but it obtained only 6" of core in 2 hrs. He explained that diamond bits are more brittle than rollar-cone bits and thus more sensitive to heave. Smaller-kerf diamond bits would be used in the proposed mine coring system.

Howard suggested that a smaller, cheaper guidebase could be constructed based on the combined experience of Legs 106 and 118. Kastner pointed out that PCOM did not consider this a high engineering priority. Howard replied that new guidebases have to built for EPR and the changes envisioned would not represent a major redesign.

Bostrom asked if drilling using a bottom-lander had been considered. Apparently this technique has been successfully used in Swedish fjords. Howard pointed out that in great water depths and for >1000 m of penetration this technology would not be practical.

3.0 WPAC Planning

3.1 Geochemical reference holes

PCOM is considering 1 leg of reference hole drilling in the second year of the WPAC program and would like LITHP input on whether additional reference hole drilling could be integrated with CEAPC proposals to drill the M-series anomalies or the Jurassic Quiet Zone (285/E, 287/E).

At our last meeting, we recommended a minimum reference hole drilling program of one deep hole outboard of the Bonins (BON-8) and three shallower holes near the Mariana transect of DSDP Legs 59 and 60. This program requires 1 1/2 legs of drilling. Although LITHP has highly rated the Jurassic Quiet Zone proposal (287/E), this drilling cannot be integrated easily with the proposed geochemical reference holes. On the other hand, site A2-2 on anomaly M-18 in the M-series proposal (285/E) east of the Bonins could substitute for the single deep hole proposed at BON-8. There was some debate on the panel as to how deep this hole should be. The consensus was that it should be a minimum of 200m deep, preferably as deep as 500m, to satisfy the objectives of both programs. There was also some discussion about the location of a major fracture zone between A2-2 and the Bonin trench, but this was not considered a major problem since the first order question of the contribution of subducting crust to arc volcanics can still be addressed by drilling at this site. While LITHP has rated the calibration of the age of the M-series anomalies highly, we are not supportive of a second hole, as proposed by Handschumacher et al., to investigate along-strike variations in crustal magnetization along an M-series lineation. We would thus rank the drilling of a 200-500m deep hole in the Jurassic Quiet Zone much higher than a second hole along an M-series lineation.

Based on these discussions we make the following recommendations:

(1) Sites MAR-4, 5 and 6 should be drilled on a single leg to be scheduled during the second year of WPAC drilling in FY90. These three, relatively shallow holes would sample the composition of the sediments entering the Mariana trench, and the summit and volcanoclastic apron of a large seamount typical of those being subducted at this arc.

(2) A second half-leg in the CEPAC program should be devoted to drilling site A2-2 east of the Bonin trench (replacing BON-8) on anomaly

M-18. This hole should be drilled ~200 m into basement. The second half of this leg should be used either to deepen this hole to 500m or to drill site J5 in the Jurassic Quiet Zone.

3.2 Co-chief nominations for WPAC legs

PCOM requested co-chief nominations by LITHP for the two Bonin legs, the Nankai, and Japan Sea legs. However, it was learned that co-chiefs for these legs had already been selected by TAMU, despite protestations by our PCOM liaison to the contrary. Not wishing to waste the panel's time, further consideration of this matter was dropped.

4.0 CEPAC Planning

4.1 Hard Rock Systems Engineering Development

Steve Howard briefed the panel on new hard rock coring systems under study by TAMU engineers. He presented three concepts being evaluated: (1) Navidrill, (2) Navidrill with downhole turbine, and (3) a top-drive mine coring system. The Navidrill was successfully tested on Leg 118 and continued development and testing are planned for future legs. The downhole-driven, turbine Navidrill system could drill significantly deeper holes, but would still be limited to a total penetration of about 250m. It would also require a large diameter hole for the turbine motor. The top-drive mine coring system may offer the greatest potential for future hard-rock drilling since the depth of penetration is limited only by drill string length (initially ~3000m). However, several important technical questions remain about the top drive system; in particular, the feasibility of two heave compensators, and whether or not the mining drill rod can withstand drilling-related bending stresses.

Howard also discussed possible solutions to the rubble drilling problem. Among the options being considered are a special tri-cone bit, drill-in casing, and percussion drilling. The usefulness of cementing was discussed; in some situations it was felt it may work, but in many highly fractured formations it may be of little value. Howard felt that some type of drill-in casing probably offers the best long-term solution to the rubble problem.

Detrick asked if adequate funding was available to support the development of these new systems. Malfait noted that much of the increase in the ODP budget is targeted for engineering development, but because the rest of the program will be close to level funded there will be pressure on the engineering budget. **The panel re-iterates that the development of these new systems are essential to LITHP drilling objectives, especially in CEPAC, and urges PCOM to insure that adequate funding and resources are available to carry out this development effort.**

4.2 EPR Working Group Report

E. Davis led a discussion of a draft report of the EPR Working Group (this report is included as Appendix A). The charge to this group was to provide LITHP and PCOM with recommendations for an EPR ridge crest drilling strategy. The working group met in February, 1988 in College Station, and their final report will be presented to PCOM in April.

The EPR Working Group proposed a suite of eight holes along and across a generic ridge segment (see accompanying figure). The entire program could take 4-6 legs of drilling. Their highest priority is to drill a single deep hole into the high temperature reaction zone immediately above the axial magma chamber. The location proposed for this hole is near the center of the ridge segment and over a well-defined axial reflector, but well outside the central zone of fissuring and normal faulting. The depth of penetration required is 1-1.5 km. This hole will probably require at least two legs of drilling. The second priority is a 500m deep hole, in the axial fissured zone, but not in an active discharge zone. The third and fourth priorities were a series of shallower holes along and across the rise axis, respectively.

The most important conclusions to emerge from LITHP's discussion of the working group report were the following:

* The panel endorsed the working group's recommendation that the highest priority should be to drill a single, deep (> 1 km) hole into the high-temperature reaction zone immediately above the magma chamber

* The panel felt the second priority should be a series of shallower holes (200-500m) across the rise axis, instead of the along-axis holes proposed by the working group. The rationale was that these holes were more directly related to the hydrothermal objectives of primary site

* Geochemical fluid sampling will be very important, but cannot be done at the time of drilling. The holes will have to be sealed for later fluid sampling and temperature measurements. Cl^{36} may be a useful tracer

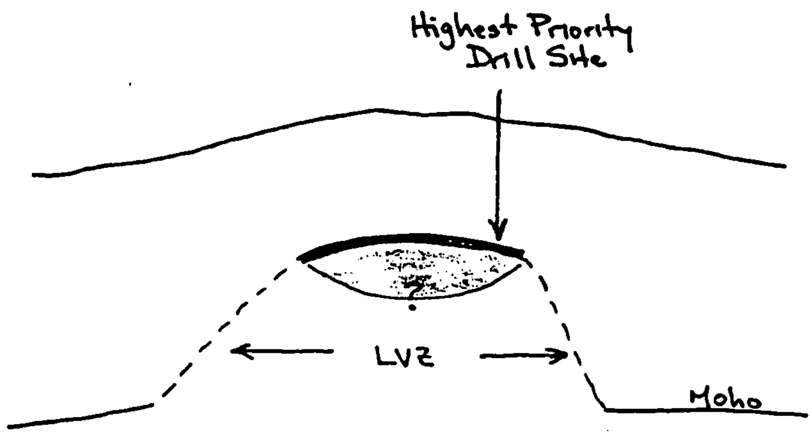
* Engineering development required for EPR drilling include: (1) overcoming the rubble problem, (2) deep penetration, (3) high temperature drilling, and (2) improved (>50%) recovery

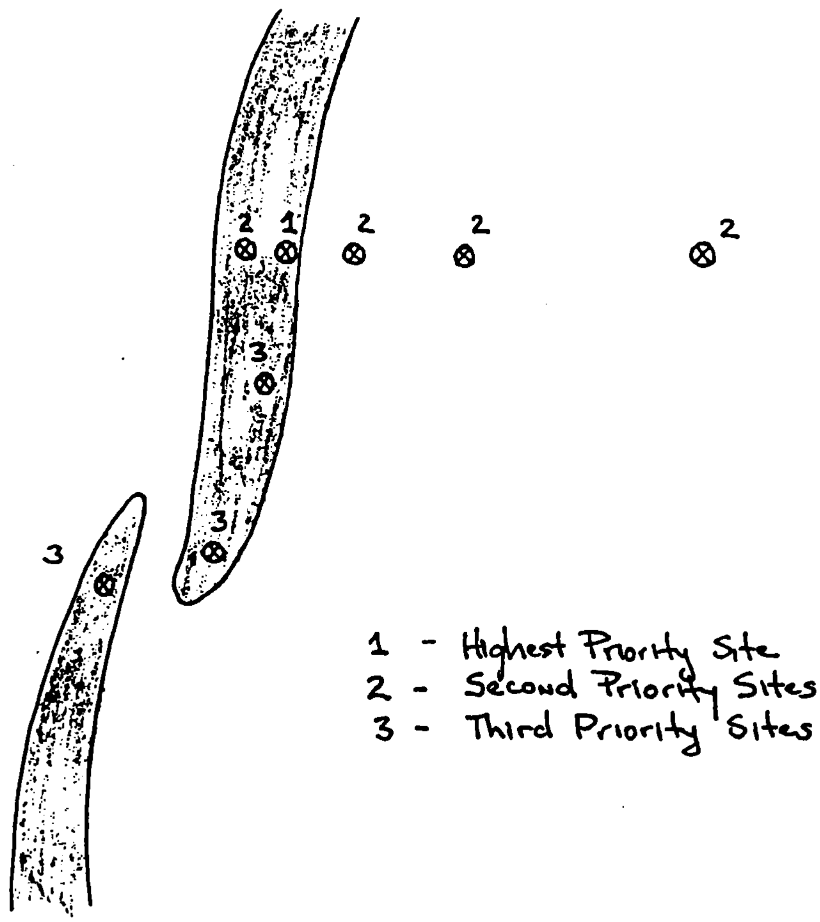
* Two or three engineering half-legs will be required before EPR drilling begins. Ideally the two EPR legs should be separated by 9-12 mo. (ie. the first leg should be scheduled early in the CEPAC program, the second leg toward the end of the CEPAC program)

* Including the engineering legs, 4 hard-rock guidebases will be required for CEPAC drilling

* The panel endorsed the working group's recommendation that if a minimum of 100-200m of penetration is not achievable, then the proposed EPR drilling should not go forward

PROPOSED EPR DRILLING STRATEGY





* The panel endorsed the site selection and survey requirements developed by the EPR Working Group. Based on these criteria the two most likely drilling areas are the 13°N area, and the ridge segment south of the Clipperton Transform near 9°30'N. Both areas are well-studied, but the 13°N area lacks a well-defined axial reflector, while vigorous hydrothermal activity has yet to be found along the ridge segment south of Clipperton. Both areas require additional site survey information (surface mapping and water column studies in the 9°30'N area; better geophysical data in the 13°N area)

* LITHP found the EPR Working Group extremely useful and feels it should serve as a model for how thematic and regional interests can be combined in a thematically-driven drilling program

4.3 Evaluation of New Proposals

Three new proposals have been received since the last LITHP meeting.

1. Principal Horizontal Stress in the Oceanic Crust (66/F Revised)

This proposal is for a program of analastic strain recovery measurements on basalt and limestone samples from Leg 123. This will yield information on <u>in situ</u> stress directions and magnitudes that will be useful in determining lithospheric tectonic processes. The method is relatively simple, inexpensive and nondestructive to core material. The largest potential problem may be properly orienting core samples. This is potentially valuable addition to ODP physical property measurements which has LITHP support.

2. Oceanographic, climatic and volcanic evolution (247/E)

Drilling is proposed along a latitudinal drilling transect in sedimentary sequences and on seamount platforms and in pelagic areas in the NE Pacific. The objectives are primarily paleoceanographic, although some of the proposed holes would provide information on the age, composition and volcanic history of the Patton-Murray Seamount Group, as well as the tectonic evolution of the NE Pacific. Although the problems addressed are important, they do not rank highly among LITHP objectives in CEPAC. We would therefore classify this proposal in our Group 3 CEPAC proposals - "Limited LITHP interest".

3. Drilling in the Ross Sea, Antarctica (296/C)

Drilling is proposed in the Ross Sea to address three main topics: (1) rifting history of the Antarctic plate and uplift of the Transantarctic Mountains, (2) Mesozoic and Cenozoic Antarctic glacial history, and (3) Southern Ocean paleoceanography. Eight shallow and one deep hole are proposed. Sites 7,8 and 9 have some LITHP interest in terms of the first objective, however this program will driven primarily by SOHP and TECP objectives. We would also rank it in Group 3 as described above.

4.4 LITHP Response to PCOM's Proposed CEPAC Program

The panel next discussed PCOM's tentative plan for approximately 18 mo. of CEPAC drilling which includes 4 legs of LITHP interest: 504B (ca. 1 leg), EPR (ca. 2 legs), and Juan de Fuca Ridge/Escanaba Trough (ca. 1 leg). This discussion was focussed around two questions: (1) Has PCOM allocated enough drilling time to properly address the scientific objectives of these three programs? and (2) Are there important LITHP themes in the CEPAC area that are not addressed by this proposed 18 mo. program?

In order to address the first question the panel briefly reviewed the objectives and drilling time requirements for the three LITHP themes approved by PCOM for CEPAC drilling.

Deep Crustal Drilling (504B) - Kier Becker discussed the drilling problems at 504B. The catastrophic bit failures on Leg 111 may have several causes: (1) junk in the hole, (2) spalling of wall rocks, (3) inability to flush cuttings, and (4) formation properties. Becker questioned whether thermal stressing was the underlying problem. He noted that penetration and recovery rates on the first two bit runs on Leg 111 were quite good and suggested that junk and cuttings in the hole were the main problem. Conventional rotary coring may be successful at 504B _if_ the hole is properly cleaned (Kier pointed out that in its initial configuration the top-drive mine coring system will have a drill string length of only 3000m and could not be used at 504B which already is 5050m bsl). There appear to be two possible solutions to this problem: (1) deviating the hole around the junk, or (2) milling out the junk in the hole. Howard estimated milling the junk could take up to 6 weeks, and the hole still might not be completely clean. Deviating the hole is technically feasible and would take less time. Howard estimated that 2-3 weeks of drilling time would be required to deviate the hole in 504B.

Approximately one half-leg of engineering work will thus be required at 504B before drilling can proceed. LITHP believes a full leg of drilling is needed to have a reasonable chance of achieving the major scientific objective of reaching layer 3. The chances of success at 504B would be severely compromised by squeezing the engineering work and scientific drilling into only one leg. We thus recommend 1 1/2 legs be devoted to 504B.

Magmatic/Hydrothermal Processes at a Fast-Spreading, Sediment-Free Ridge Crest (EPR) - Although the drilling stragegy developed by the EPR Working Group may require 4-6 legs of drilling to complete, the panel felt 2 legs were adequate for the 1st phase of this drilling _provided_ at least two engineering half-legs were scheduled after 124E to test and develop new hard rock coring techniques. From an engineering perspective, Howard felt a spacing of about 12 mo. would be needed between these legs, meaning that the first EPR leg should be scheduled early in the CEPAC program and the second leg toward the end.

The panel is thus satisfied with the 2 legs allocated to EPR drilling planned by PCOM for this phase of CEPAC drilling.

Magmatic and Hydrothermal Processes at Sedimented Ridge Crests (Juan de Fuca Ridge/Escanaba Trough) - The panel did not have time at this meeting to discuss the scientific objectives and integration of the three proposals that address this important LITHP theme. However, the consensus of the panel was that a minimum of two legs would be required to adequately address magmatic/hydrothermal processes at sedimented ridge crests, and questions related to ore genesis and sulfide deposition.

At the second meeting of the EPR Working Group, LITHP would like to see the working group integrate these proposals into a coherent drilling strategy for sedimented ridge crests. For this discussion it will be necessary for the working group to have a new chairman (Davis is a proponent of drilling in this area) and the committee membership may have to be augmented somewhat to provide the necessary regional and thematic expertise in this area.

The second question considered by the panel was whether or not the proposed 18 mo. CEPAC program will leave out important LITHP drilling themes. The most obvious ommission in the proposed program is lack of any hotspot drilling. In fact, it is inconcievable that the drillship could pass through the Pacific without drilling a young hot spot volcano. Hot spot volcanism is a major global process which has played a particularly important role in the tectonic evolution of the Pacific. The early history of hot spot volcanos is a critical problem which can only be addressed in the Pacific. We have two highly rated proposals (Loihi - 282E; Marquesas - 291E) focussed on this problem and LITHP believes that at least one leg of drilling should be included in this phase of CEPAC drilling to address this problem.

There are two other CEPAC programs that will probably be driven by SOHP and TECP interests that LITHP also supports. These include the dating of M-series anomalies and Jurassic Quiet Zone crust in the western Pacific (discussed above in the context of Geochemical Reference Holes), and drilling of at least one large oceanic plateau in the Pacific, probably Ontong-Java. In both cases LITHP would support drilling one or more holes 100-500m into basement.

In summary, we believe a core LITHP program in the CEPAC area consists of a **minimum** of 6 1/2 legs:

1 1/2	legs	504B
2	legs	EPR
2	legs	Juan de Fuca/Escanaba
1	legs	Young hot spot volcanism (Loihi, Marquesas etc.)
-----		
6 1/2	legs	

6.0 Long-Range Planning (1992 and beyond)

PCOM has asked the panels to look beyond the CEPAC program and develop their global thematic drilling priorities with a view toward defining where these problems can be best addressed.

LITHP began this discussion with a review of the COSOD II recommendations and the panel's response to those recommendations. Malpas expressed the view that the objectives in the LITHP White Paper and COSOD II are similar, except for the greater emphasis on geochemical mapping in the Working Group 2 report. Detrick pointed out that LITHP represents a broader community than Working Group 2; major lithopsheric drilling themes were also discussed by Working Groups 3 and 4 as well. There was agreement on the panel that the long-term LITHP objectives identified in our White Paper are consistent with the COSOD II recommendations. Cathles argued that ocean drilling was originally sold as a way of testing the plate tectonics paridigm. That has been done and the idea of global cycles - in climate and in the solid earth - provide a framework in which to continue ocean drilling. Peterson commented that the composition of the panels are constantly changing and therefore priorities will change. However, others felt the top 3 or 4 lithospheric drilling objectives will remain the same, although their relative ranking may change as individuals rotate on and off the panel.

In terms of post-1992 planning, the panel attempted to develop priorities within the framework of understanding the solid earth as a global geochemical system. There are three main components of this system that drilling can study: accretionary processes, mid-plate processes, and convergent margin processes. The panel felt the initial emphasis should be on accretionary processes - what is the structure of the oceanic crust and how is it formed? Addressing this objective requires drilling along two or three spreading ridges (slow and fast, sedimented and unsedimented), as well as one or more deep, crustal penetration holes off-axis on older crust. While the primary emphasis should be on these two drilling objectives, the panel recognized it will also want to support drilling which address other components of this system, if the objectives are consistent with the long-range goal of understanding global solid-earth geochemical cycles.

Where should this drilling be carried out? Lithospheric drilling will, of necessity, be focussed on a relatively small number of relatively deep, expensive holes. It is critical that these holes be concentrated in a few, well-studied, representative areas and that they be only one component of a long-term, multidisciplinary program of investigations. The best locations for carrying out this type of drilling effort will be in the eastern Pacific (eg. EPR, Juan de Fuca Ridge) and in the North Atlantic (eg. MARK, Reykjanes Ridge). Deep crustal drilling can potentially follow two different strategies: (1) drilling through the entire crustal section at sites like 504B or 418A, (2) drilling proximal to fracture zones where the deeper crustal levels may be exposed like at 735B on SWIR or near many large Atlantic fracture zones. Thus in the post-1992 time frame LITHP sees it highest priority drilling objectives located <u>primarily</u> in the eastern Pacific and North Atlantic, although some forays in the central and western Pacific or the Indian Ocean may be needed. A second circumnavigation of the drillship would definitely not be in the best interests of the lithospheric community.

7.0 Other Matters

7.1 LFASE - Low Frequency Acoustic Seismic Experiment

John Orcutt described LFASE, a borehole experiment designed to develop a better understanding of the physics of the excitation and propagation of low frequency noise (0.01-50 Hz) immediately above, at and below the seafloor (see Appendix B). The proposed work will be carried out in two stages. In the first stage, a caliper log will be run in the borehole and a seismic and acoustic sensor package lowered into the hole using a ROV. While the surface ship is still tethered to this package other ships will shoot a series of radial and circular seismic lines. In the second stage of the project, the surface ship will separate from the borehole sensor package and leave the area in order to record ambient noise levels. The seafloor recording package and the borehole sensors will be recovered after about 45 days of recording.

The experiment has fairly stringent site criteria which restrict the number of candidate holes. These criteria include deep water (>4000 m), thin sediments (>50m and <1000m), accessibility, and a nearby backup hole. The optimal location for this experiment is 417D, 418A south of Bermuda. Wireline re-entry is a new proceedure and there is some risk these operations could damage the hole or equipment could be left in the hole.

The panel discussed this situation, especially with respect to Hole 418A which is a valuable hole that is a candidate for deepening into the lower crust. In general, there was strong support for the development of wireline re-entry techniques and the utilization of existing boreholes for these types of experiments. The technology developed for LFASE will be valuable for future borehole experiments and long-term monitoring at holes like those proposed at the EPR. To minimize the risk to 418A, the panel urged close collaboration with the TAMU engineers with the possibility of designing sensor packages to facilitate retrieval from the hole.

7.2 Panel Advisory Structure

LITHP endorses the recommendations contained in the preliminary report of the PCOM Subcommittee on changes to the JOIDES Panel Structure.

7.3 Panel Membership

Julian Pearce was appointed the new WPAC liaison. J. Franklin will replace J. Malpas and J. Ertzinger will replace N. Peterson.

7.4 Next Meeting

The panel voted overwhelmingly (19-1) opposing the PCOM suggestion that every other panel meeting be held in College Station. College Station is difficult to reach and holds few attractions outside of Dudley's Draw, the Dixie Chicken and barbacue ribs. In many cases, like this LITHP meeting, it would be far more valuable for the engineers to travel to a meeting outside of College Station since they will be freed of the day-to-day distractions of the office and may have a chance to see places (like an active volcano) and meet people (like drillers from the Hawaiian Hydrothermal Project) that can give them a new perspective on their work.

In the spirit of this view, the next LITHP meeting was tentatively scheduled for 12-17 Sept. in Corner Brook, Newfoundland (including a 2-day field trip to the Bay of Islands ophiolite). John Malpas will serve as host.

APPENDIX A

DRAFT REPORT OF THE ODP EAST PACIFIC RISE WORKING GROUP

Prepared by the Working Group members:

Keir Becker
John Delaney
Bob Detrick
Earl Davis (Chairman)
Craig Forester
Jean Francheteau
Steve Howard
Ken Macdonald
Mike Mottl
Mike Perfit
Ralph Stephen
Rob Zierenberg

DRAFT SUMMARY 88-02-26

Guidelines

The objective of this working group is to provide the ODP planning structure with recommendations for an East Pacific Rise ridge-crest drilling strategy. The discussions were guided by the scientific objectives outlined in reports of preceeding planning groups, namely those of COSOD I, COSOD II, and the JOIDES Lithosphere Panel. The drilling strategy was developed with what are anticipated to be realistic engineering constraints in mind. It should be emphasised that many of these constraints will not be realistic unless major engineering developments devoted to improved crystalline rock drilling and recovery (currently in a mature planning phase) proceed in a timely fashion. Site-specific information was considered in the discussions of the group, but no single specific drilling site is explicitly favoured in the report. Instead, a suite of generic sites are proposed, and specific criteria for optimal site selection are presented.

Working hypotheses concerning ridgcrest magmatic, structural, and hydrothermal processes and their interrelationships are numerous, and require tests by several disciplines of marine science. ODP is just one of a number of tools that can be used to approach these problems, and there is a clear need to integrate many of the experiments that will be carried out in the ridge environment during the next decade. The program outlined here, already an integration of site survey experiments, core sampling, and short- and long-term down-hole observations, will hopefully be an integral part of a much broader sampling and observational program focused on a single ridge segment, with each tool used in an optimal way.

General Objectives

With these guidelines in mind, the following goals were considered to be of highest priority for an East Pacific Rise drilling program, particulary as they can be uniquely adressed by drilling:

1) To test the hypothesis that a reaction zone exists regionally above an axial magma chamber where fluids are in contact with high-temperature rock, and to observe the chemical and physical nature of the water-rock interaction there.

2) To characterize the physical and compositional structure of young oceanic crust.

3) To determine the temporal variability in the composition of magmas supplied to the ridge crest.

4) To "ground-truth" geophysical horizons that can be mapped widely and efficiently through remote seismic and/or electrical methods.

5) To characterize the way in which the oceanic crust is physically and chemically altered by prolonged hydrothermal circulation. (This problem requires additional drilling at older ridge-flank sites.)

Strategy

A suite of eight holes is proposed. Clearly, only a portion of this program can be completed in the time available during the upcoming phase of central and eastern Pacific drilling. Four to six legs may be required ultimately. All holes address high priority objectives, however, and it was felt that all portions of the broader program should be discussed and included in the current phase of planning. The holes can be grouped in order of their relative priority as follows:

1) The greatest technical challenge must be met with a hole that penetrates to a depth as close to the top of the axial magma chamber as possible. This hole should be situated near the centre of the ridge segment and over a clear axial seismic reflector, but well outside the central zone of active fissuring and normal faulting (i.e. 1 - 2 km off-axis). The depth of penetration required for this hole is roughly 1 - 1.5 km below the sea floor, about 4 km below sea level. Completion of this most difficult hole in two drilling legs would be considered a success.

2) A second hole should penetrate the upper crust of the axial fissured zone, but not into an active discharge zone. This hole should penetrate through the intrinsically permeable extrusive layer of the crust and far enough into the underlying dike complex to characterize the thermal field and possibly the permeability there. Completion of this hole will require approximately 500 m total penetration.

3) A pair of additional holes along the segment axis and a third hole on the adjacent overlapping segment axis will compliment holes 1) and 2) and provide an along axis petrologic and chemical transect for determining the nature of the temporal and spatial variability of lavas erupted along the axis of the segment from its centre to its distal end. These holes should be sited in a position similar to 1), but penetration only of the extrusive layer is required (approximately 300 m).

4) A second suite of three holes situated across the ridge segment summit will also compliment holes 1) and 2). This

transect will allow a longer time sample of the petrologic variability of a single ridge segment to be studied, although to a certain degree this can be approached through surface sampling. More importantly, it will allow the time-dependent hydrothermal alteration of the crust to be studied. The primary objectives can be reached again by drilling the extrusive section only (c. 300 m), although additional penetration into the upper 100 to 200 m of intrusive section would be valuable for chemical and hydrologic studies.

5) A hole in an axial discharge zone was considered to be a very high priority, but it was unanamously agreed that as yet, no discharge zone yet observed on the East Pacific Rise is sufficiently large or "mature" to warrent drilling. The objectives to be met with a hole or array of holes at a discharge site must be approached at another more suitable location.

Criteria for Site Selection and Recommendations for Site Surveys

Tectonic, magmatic, and hydrothermal processes at mid-ocean ridges are spatially and temporally variable, and are dependent on spreading rate. Thus there is no single "type" section. Certain characteristics are desirable, however, so that a focused drilling program can address the above problems well. The segment to be drilled should have:

1) Fast but not ultra-fast spreading rate. This and the need to be away from the magnetic equator requires that the program be located between 5 and 18 degrees north.

2) A strong, continuous, and shallow axial seismic reflector, suggesting the presence of a shallow crustal magma chamber.

3) Vigorous hydrothermal activity.

4) Simple topography, structure, and history.

5) A well defined overlapping rift offset on at least one distal end.

6) A well defined upper crustal reflector (inferred to be the base of the primary extrusive layer) beneath portions of the segment axis and flanks.

7) Relatively simple variations in basalt composition along the segment axis.

Perhaps more that any other program, the sucess of drilling relies heavily on segment and site characterization. Studies must range in scale from regional mapping (much of which is well in hand or underway) to detailed engineering-scale geophysical studies that can reduce the chances of spudding into highly incompetent formation. Time is short, and fortunately segment-scale investigations are numerous enough that the first decision, that of which ridge segment should be drilled, can be made with reasonable confidence soon. Concerted efforts then must be made to complete the necessary detailed surveys and sampling.

Requirements for Engineering Developments

None of the drilling proposed should be attempted with currently employed drilling technology. The following difficulties place new and challenging demands on ODP:

1) The upper section of young oceanic crust is known to be highly incompetent. Casing may need to be set in the upper tens of metres of this potentially rubbly material at every hole. Several hundred metres of penetration, with at least 50% recovery, are required at every hole.

2) The highest priority objective requires penetration and sampling to a depth of at least 1 km below the sea floor, approximately 4 km below sea level.

3) High temperatures will be encountered at depth in many of the holes. It must be anticipated that in the highest priority hole, formation temperatures will exceed 400 degree Centigrade. Mechanical and chemical consequences must be considered for drilling, sampling, and logging.

4) Due to the inability to observe in situ temperatures and pressures and to sample formation fluids in an open hole, a means by which the top of the holes (the deep axial hole as a minimum) can be sealed with sensors in place down the hole must be developed.

Adaptation of high-speed, narrow-kerf diamond drilling technique to the JOIDES Resolution is currently under study. This technique is used commonly in crystalline rock on land by the mineral exploration and geothermal industries, and it offers an excellent chance for dealing with many of the problems outlined above. A new departure such as this is the only way that will allow any of the high priority objectives outlined in this report to be met. It is essential that this and other necessary developments proceed rapidly and that adequate testing of new tools be executed before this East Pacific Rise drilling program begins.

THE 1989 LOW FREQUENCY ACOUSTIC-SEISMIC EXPERIMENT

2 March 1988

The Low Frequency Acoustic-Seismic Experiment (LFASE) is a scientific endeavor scheduled to take place in the spring of 1989. The major objective of this experiment is to develop a better understanding of the physics of the excitation and propagation of low frequency noise (0.01 - 50 Hz) immediately above, at and below the seafloor. In addition to these noise experiments, we shall conduct signal experiments using a variety of impulsive and oscillatory sources at the ocean surface. Data from these signal experiments will delimit the elastic properties of the bottom for use in the noise studies as well as provide unique data for understanding the attenuation of sound in the coupled ocean-seafloor system.

The investigators will develop and exploit a new ocean technology to locate and probe DSDP holes with a maneuverable, tethered deep submergence vehicle. Using this technology they will emplace a multi-node seismic sensor within the cased portion of DSDP borehole 418. The overall system will consist of the borehole, three-component inertial sensors and borehole hydrophones as well as ocean bottom seismographs and a vertical hydrophone array. The experiment will be preceded by a visit of the re-entry system to the borehole to determine the condition of the re-entry cone using sonar and photographic means as well as a re-entry of the hole with a caliper log.

The actual LFASE experiment will consist of two complementary stages. In the first stage, the R/V Melville will emplace the instrumentation on the seafloor and within the borehole while remaining coupled to the borehole seismic and acoustic sensors through the re-entry vehicle and its tether. Other ships will shoot a series of radial and circular lines using airguns, explosives and tuned sources to provide data required to characterize the seafloor including the sediments, crust and uppermost mantle. The subsequent data analyses will employ a full suite of techniques for determining the vertical elastic properties of the seafloor as well as the anisotropic behavior of the ocean crust and uppermost mantle.

The second stage of the experiment is designed to provide recordings of long time series of unadulterated seafloor noise in the absence of ships. The R/V Melville will divorce itself from the borehole sensors and return to port with the shooting ship. The ocean bottom seismographs and the borehole sensor recording systems are presently being modified to provide several gigabytes of recording capacity in order to allow nearly continuous seafloor recording. Data from all the sensors will be jointly examined to develop a full understanding of the noise at the bottom. The R/V Melville will return to the recording site after several weeks to recover the seafloor apparatus and extract the borehole array from DSDP Hole 418.

Overall coordination for the program is provided by the Johns Hopkins University Applied Physics Laboratory with assistance by a group of scientists from government and private organizations including the Science Applications International Corporation (SAIC), the Naval Oceanographic Research and Development Activity (NORDA), Woods Hole Oceanographic Institution (WHOI) and the Scripps Institution of Oceanography (SIO).

Fiscal Year 1988 tasks include the purchase (from CGG of France) of the multinode and multicomponent broad band seismograph for emplacement in the seafloor (WHOI/MIT), design and construction of the bottom control unit for the array (WHOI), the updating of the electronics, timing and recording capacity of available ocean bottom seismographs (SIO and NORDA), updating the VEKA vertical hydrophone array (NORDA), and the preparation of a Remotely Operated Vehicle (ROV) for borehole re-entry (SIO).

The Ocean Drilling Program (ODP) and the Joint Oceanographic Institutions, Inc. (JOI) have supported related research objectives and planning for future experiments. The JOI U.S. Science Advisory Committee (USSAC) sponsored a workshop in 1987 entitled *Science Opportunities created by wireline re-entry of deepsea boreholes* and the USSAC Program Plan calls for the development of a wireline re-entry system for general seafloor use during the next three years. Borehole seismometry and sub-seafloor instrumentation are the subjects of another JOI-USSAC workshop scheduled for April 1988, *Permanent Ocean Bottom Geophysical Observatories.*

This project is made possible by the successes of the Deep Sea Drilling Project (DSDP) and the Ocean Drilling Project (ODP) which have been sponsored by the National Science Foundation and several non U.S. partners. This research follows directly from the earlier DSDP studies in the Atlantic in a re-entry and recovery from Hole 395A in 1981 (Leg 78B) and in the Pacific at Hole 581 (leg 88, 1982) and the later Ngendei Experiment (Hole 595B during Leg 91 in 1983). These earlier experiments were funded by the Defense Advanced Research Projects Agency (DARPA) and this agency is providing the major share of the funds for this experiment. The development of reliable and affordable deep sea maneuvering systems that can operate from conventional research ships will extend the scientific yield from the seafloor boreholes. The ODP regularly exploits the holes drilled in the seafloor from the D/V JOIDES Resolution through petrological, geochemical and paleomagnetic studies of the samples and logging, electrical and seismic studies of the holes. These decades of studies recognize that the existing boreholes are a scientific legacy that are available for further exploitation. Studies such as LFASE are required as ocean scientists seek to exploit seafloor measurements in the global study of the Earth through the deployment of long term observatories.

The first actual tests of a re-entry system were carried out in France using the submersible Nautile in 1986. The French approach used a special frame (NADIA - Navette de Diagraphie) fitted with a logging winch and 1,000 m of cable which was docked in the re-entry cone by the submersible. The next step in the French program will be to re-enter DSDP Hole 396B in the Atlantic. Scientists at the Pacific Geoscience Centre in Canada intend to use an advanced ROV for re-entry with a NADIA-like system. At a later stage, the Canada group would use the ROV to guide instruments, suspended from a surface ship, into a re-entry cone. This is very similar to the approach being taken in LFASE.

DRAFT MINUTES

SEDIMENTS AND OCEAN HISTORY PANEL

Rice University
March 7-9, 1988

Members Present:

A. Droxler (Rice Univ)
P. Froelich (LDGO)
R. Gamson (USSC)
M. Goldhaber (USGS)
D. Kent (LDGO)
L. Mayer (Dalhousie - Chairman
P. Meyers (U. of Mich)
W. Normark (USGS)
I. Premoli-Silva (Milan, Italy)
T. Saito (Yamegata, Japan)
R. Sarg (Exxon)
A. Schaaf (GIS, France)
R. Stein (Giessen, FRG)
N. Shackleton (Cambridge, U.K.)

In Attendance:

J. Austin (ARP)
G. Brass (PCOM)
S. O'Connell (TAMU)
W. Sliter (CEPAC)

Absent

W. Berger (SIO)

1. Opening Remarks and Approval of Previous Minutes:

   1.1 The meeting began at 8:45 a.m. with introductions and welcome from André Droxler on behalf of Rice University.

   1.2 The minutes of the 31 August - 2 September meeting in Tokyo were accepted.

2. Panchmn Meeting Report (Mayer):

   The Chairman reviewed the results of the annual Panel Chairman's meeting held in conjunction with the PCOM meeting in Sun River, Oregon. The majority of time at this meeting was spent discussing models for the JOIDES Advisory Panel structure. The wide range of views expressed by the PANCHM emphasizes the difficulty in establishing a broadly accepted planning structure. The final PANCHMN recommendations were presented as were the recommendations concerning Engineering Developments and ODP publications.

3. PCOM Report (Brass):

   G. Brass reviewed the results of the Sun River PCOM meeting.

3.1 The approved WPAC program was presented: (Appendix A)

3.2 Brass commented that PCOM was evolving and taking a more active role in reviewing programs and making scientific decisions.

SOHP is pleased to see PCOM taking a more active role in reviewing the science but is concerned that PCOM may not have the regional or disciplinary representation that the thematic and regional panels possess. If PCOM is to take this more active role we would hope that care is taken to see balanced representation on PCOM.

3.3 PCOM has formed a committee to evaluate Advisory Panel structure. This committee will make submission to PCOM in April. Initial feedback suggests that planning will be thematically driven, that 'working groups' may play a more active role and that the mandate of SOHP will be covered by more than one panel.

<u>SOHP strongly supports these preliminary recommendations and encourages their implementation</u>.

3.4 The initial PCOM decisions on CEPAC were presented. These will be discussed in the CEPAC section of the minutes.

3.5 The lengthy PCOM discussion of engineering problems was discussed.

The SOHP has long recognized the poor communications between the scientific community and the TAMU engineers. We applaud both PCOM's and TAMU's efforts to resolve these problems and in particular support the establishment of dedicated engineering legs and of a PCOM watchdog panel charged with monitoring engineering activities.

The SOHP is happy to see engineering legs that are free from scientific interference, but remind PCOM and TAMU that it is critical that scientists be the judge of the relative success of many new systems (e.g. the engineering definition of a successful core orientation device often greatly differs from the scientists).

4. TAMU Report (O'Connell):

4.1 Summaries of the drilling results of Legs 118, 119, and 120 were presented.

4.2 Progress made on NAVIDRILL reported:

- experiments have been carried out with several new bits
- it is now free-fall deployable and compatible with XCB and ACB
- it is presently being tested on various rock types in Germany
- it will be deployed on Leg 121

4.3 Leg 124E (Engineering Leg) Priorities:

- 30-day leg
- Test diamond coring system for EPR & possibly cherts
- DMP has requested 5 days for testing of wireline packer, heave compensator, formation microscanner, Geoprops probe

5. Sampling and Technology Issues:

5.1 Whole-round sampling:

The SOHP has long been concerned with inflexible sampling policies that have included routine whole-round sampling for physical properties and geochemistry. <u>We applaud the IHP recommendation to end routine whole-round sampling for physical properties (they have recommended that a review board approve requests for whole-round physical property samples) and urge IHP to establish similar guidelines for geochemical whole-round sampling</u>.

5.2 Pore water analysis:

It has been pointed out to the SOHP that routine pore water analyses program on board the Resolution is in desperate need of modernization. <u>P. Froelich will review the situation and submit a report to the SOHP</u>. The SOHP will pass its recommendations on to PCOM and TAMU.

5.3 Microscopes:

Numerous shipboard participants have documented the poor state of maintenance of shipboard microscopes. <u>The SOHP urges TAMU to assign to one of the shipboard technicians the responsibility of routinely maintaining shipboard microscopes</u>.

5.4 Paleomagnetics:

The paleomagnetic record is of fundamental importance in establishing the temporal framework for almost all ocean history studies. Despite this, and despite repeated requests on the part of the SOHP, problems of core orientation and barrel magnetization continue to plague the program.

Dennis Kent will document these problems and submit a report to the SOHP. Upon receipt of this report, the SOHP recommends that TAMU call a meeting of, or solicit opinions from a number of active paleomagnetics specialists to discuss core orientation and core magnetization problems. The SOHP further recommends that TAMU explore the feasibility of using non-magnetic drill string and that time be allotted on a future engineering leg to explore means of resolving paleomagnetic problems.

5.5 Heat Flow Probe:

The SOHP has received several reports of inconsistent and unreliable measurement from the ODP heat flow probe. The problems seem to be related to motion of the drill bit. We recommend that TAMU investigate the reliability of the heat flow measurements being made.

5.6 Double HPC's:

Both the SOHP and PCOM recommended double HPC of Site 677 to ensure continuous recovery. Unfortunately, the double HPC samples received from this site overlapped by 1 m or less, not enough to ensure a continuous section. <u>The SOHP urges that TAMU establish guidelines for the proper drilling of overlapping sections and that these be available to the Co-chiefs and the drilling crew</u>.

5.7 Sub-bottom Depths:

The ability to draw stratigraphic correlations is strongly related to our ability to accurately determine sub-bottom depths. The SOHP has been disturbed by several reports of large hole-to-hole inconsistencies in the sub-bottom depths of clearly identifiable horizons. These inconsistencies call to question the accuracy of shipboard sub-bottom depth calculations and can severely compromise our achievable stratigraphic resolution. <u>The SOHP requests that TAMU assess their ability to accurately measure sub-bottom depths and explore means of improving these measurements</u>.

6. Information Handling Panel Report (Mayer):

6.1 The results of the Information Handling Panel's meeting were summarized. Our Japanese representative was informed that the Japanese paleontological reference collection has not been updated because no samples have been taken recently. Efforts are underway to begin paleontological reference collection sampling again.

6.2 The SOHP applauds IHP's effort to update and maintain the databases.

6.3 The SOHP understands the IHP's concern for demonstration of the responsibility of those requesting samples but requests that such documentation be kept on file for those making multiple sample requests, thus reducing unnecessary paperwork.

6.4 The SOHP was concerned to learn of a situation where the TAMU core curator denied the post-cruise sample request of a German investigator claiming overlap in interest with another (TAMU) post-cruise investigator. We request that the IHP establish a policy on such requests that might avoid the appearance of conflict of interest.

7. Indian Ocean (I. Premoli-Silva):

7.1 Isabella Premoli-Silva reviewed the status of upcoming Indian Legs.

7.2 The sedimentary sequences that will be cored on Leg 121 are potentially of great interest to SOHP. We urge that all efforts be made to ensure their proper recovery and sampling.

8. Atlantic Ocean (J. Austin):

8.1 The Atlantic Regional Panel members have been involved in organizing a series of workshops and will continue doing so.

9. Southern Ocean (P. Meyers):

Since our last meeting, the SOHP has received two proposals for drilling in the Southern Ocean. In light of our new mandate to review every proposal, we discussed each in detail.

9.1 Proposal 297/C (Barker et al.):

Objectives: a) history of uplift and subsidence of the fore-arc resulting from subduction of a spreading center

b) fore-arc structure; thermal metamorphism
c) history of Antarctic Peninsula glaciation
d) changes in terrigenous sediment supply relative to tectonic and climatic history.

This proposal contains two objectives (C and D) that are clearly of interest to the SOHP. However, several concerns were raised:

(a) the problems associated with recovery in tillitcs
(b) the problem of dating the section (low carbonate, high terrigenous input, numerous turbidites and hiatuses (e.g. Site 325)
(c) proposal is immature--new seismic data is needed
(d) we would like to see Bransfield Strait objectives included
(e) question merits of site relative to Legs 113 and 119 sites.

In summary, we see several objectives that are of strong SOHP interest in this proposal, however, the paleoceanographic objectives must be better developed, and we should await the workup of Leg 113 before it is considered further.

9.2 Proposal 296/C (Cooper et al.):

Objectives: a) Antarctic rifting history; uplift of transantarctic mountains
b) timing of rifting and rift grabens

c) Mesozoic and Cenozoic glacial history

This proposal suggests a series of sites that should result in a relatively high-resolution Neogene glacial record in a rare locality where erosion has not removed the record. This is extremely important to the SOHP and quite complimentary to Leg 113. The tectonic objectives are plausible and critical to understanding the glacial history of Antarctica. There is a brief discussion of paleo-seaways that could be better developed, but all-in-all the SOHP is very enthusiastic about this proposal.

10. Western Pacific (R. Sarg):

10.1 Geochemical Reference Holes:

PCOM has asked SOHP to evaluate the concept of Geochemical Reference holes particularly with regard to the Bonin/Marianas area and Old Pacific Crust.

The objectives of the geochemical reference sites were reviewed. Geochemical mass balances are clearly within the mandates of the SOHP but never among our highest priorities.

Several questions about the geochemical reference hole program were raised:

a) Major concern was heterogeneity of both sedimentary section and oceanic crust. Inasmuch as we do not full understand this heterogeneity, we do not see how a few number of holes can address this problem and why one spot is better than another.

b) Single holes may be very incomplete - we do not know how much of section is actually being subducted. It may be more appropriate to take averaged of all samples recovered in given ocean.

c) We do not yet understand the role of fluid interaction in terms of chemical mass balances. How is this taken into account?

d) If 'geochemical reference site' hypothesis is valid--we should see significant differences in areas behind regions subducting different types of oceanic sediments. Do we? Be^{10} data suggests that the situation is much more complicated than that proposed.

In summary, the SOHP supports the concept of geochemical reference sites but believes that there are a number of problems associated with the hypothesis. In particular, problems with poorly understood heterogeneity weaken the argument for the specific siting of reference holes. <u>We, therefore, recommend that reference sites be optimized for other objectives, that a strictly geochemical reference site not be drilled in WEPAC and that for the Pacific, an Old Pacific crust site would be most useful for this study</u>.

10.2 South China Sea Margin Transect - 46/D (Hays et al.):

The WEPAC Panel has been impressed by the new site survey data from the SCS transect region. The SOHP reviewed this proposal in the light of paleoceanographic and particularly sea level objectives and came to the following conclusions:

The SOHP strongly supports the concept of a S.C.S. Margin transect, particularly if industry well data on the margin is available. Such a transect is particularly relevant to our (and COSOD II's) high priority objective of establishing the history of sea-level fluctuations inasmuch as it provides an important compliment to data to be recovered from the N.E. Australian Margin and atoll drilling. In addition, this young oxic basin provides a good comparison to the anoxic Sulu Sea.

However, as presently written the proposal does a very poor job of documenting how the selected sites could be used to address the question of sea-level history. In particular, there is no discussion of how the siliciclastic sequences will be dated. In addition, the SOHP feels that the proposal does not demonstrate the adequacy of the site surveys for selecting the sites chosen. Are crossing MCS lines available for selected sites?

Given the sites proposed, the SOHP believes that this program will probably take more than one leg. We prioritize the proposed sites as follows:

SCS 1 - basinal oceanic crust
SCS 4 - slope, on hinge line (must avoid faults!)
SCS 3 - slope, synrift and rift sediments
SCS 2 - rise, synrift and rift sediments

In summary, the SOHP sees the potential of deriving important sea level and paleoceanographic information from the SCS margin transect. The proposal does not fully develop the approach to be taken for these studies. More critically, the proposal does not adequately justify the selection of sites based on site survey data. Until such justification is provided, the SOHP cannot evaluate this program and recommends that this time be shifted to higher priority objectives in the CEPAC region.

10.3 N.E. Australia margin

The Chairman reported to the Panel the progress made in producing a N.E. Margin drilling prospectus. This prospectus was accepted by PCOM. It is possible that the program described in the prospectus would take more than one leg. If so, the SOHP recommends dropping 9A or 10 and Site 13.

The SOHP continues to support, in principle, the MVT proposal designed to look at the pre-mineralization host environment at the existing NEA sites. The Chairman has written to the MVT proponents and asked them to provide accurate estimates of the time needed to conduct their experiments and to carefully look at the availability of needed tools.

10.4 Nankai Geohydrology - 295/D (Geiskes et al.):

At our last meeting, we were asked to comment on a geohydrology program at Nankai. While we confirmed our interest in geohydrology studies, we could not respond to specific questions without a proposal. A proposal has now been submitted and the SOHP is quite disappointed. Specifically, the proposal is very poorly documented.

- there is little information on the exact studies proposed;
- there is little discussion of what measurements should be made;
- there is little discussion of how measurements will be made;
- there is no discussion of how much drilling time is involved.

Is extra shiptime necessary?

More critically, this proposal is not at all tied to either of the other two existing Nankai proposals and the details of how the proposed measurements will be related to hydrogeological processes is not addressed. We would also like to see justification of why Nankai is more appropriate than the Oregon Accretionary Prism for a hydrogeology program.

Given these deficiencies, the SOHP cannot support a leg devoted to these studies. Based on the information provided, we recommend that a geohydrology program be added to the objectives of Nankai I (Leg 127) to be fit within the existing time frame.

10.5 Proposal 287/D - ^{10}Be (Sacks et al.):

^{10}Be, a cosmogenic radionucleide with a relatively short half-life and an affinity for sediment has been identified as a possible tracer of subduction processes. This proposal is very relevant to geochemical reference sites and should be incorporated into any reference hole study. However, because of the short half-life and generally low oceanic sedimentation rates, the SOHP believes that such a study may be more appropriately done with a large number of standard piston cores rather than the drill ship.

10.6 WPAC Co-chief Recommendations:

TAMU informed us that all Co-chiefs have been selected except for one each on Legs 128 and 129. For either of these legs, we suggest:

Jim Ingle
Carolyn Isaacks
Hugh Jenkyns
Joe Morely

11. CEPAC:

The relevancy of discussion of the CEPAC panel's last meeting was questioned in light of the results of the most recent PCOM meeting and PCOM's directives regarding CEPAC drilling. Similar questions have been raised by CEPAC proposal proponents (e.g. Sancetta letter - Appendix B) regarding the status of their efforts in light of the PCOM directives. These are important questions that must be addressed by PCOM.

In the absence of additional guidance, the SOHP will proceed with CEPAC planning as it has in the past. We cannot (nor do we want to) ignore the substantial efforts of our colleagues on CEPAC as we cannot dismiss the efforts of the numerous CEPAC proponents who continue to submit proposals. We will, therefore, discuss the results of the CEPAC and proceed to review, in detail, all new CEPAC proposals submitted to the Panel. When we have finished these discussions, we will evaluate the new proposals in light of our previously established CEPAC themes and rank them in this thematic framework relative to all other CEPAC proposals. Upon completion of this procedure, we will discuss and respond to the PCOM's CEPAC directives.

11.1 CEPAC Panel: (W. Sliter)

CEPAC has reviewed the top priorities of the three thematic panels and produced a second prospectus that consists of 22 legs. The prospectus does a good job at incorporating the highest priority objectives of the SOHP and while we believe that there is room in this prospectus for combining programs, it is a reasonable starting point for CEPAC planning.

11.2 New Proposals: 247/E (revised) (Bornhold et al.)

This proposal contains a number of objectives that are within the SOHP's top ranked CEPAC theme of Neogene Paleoceanography. More importantly, it addresses these objectives in the North Pacific, potentially providing some of the highest latitude sites available to us. The drilling strategy outlined by both SOHP and COSOD II for addressing these problems is one of transects and the sites proposed here could become key high-latitude components of a latitudinal transect.

Several concerns were raised, however. In particular was concern over the ability to recover sequences with well-preserved carbonate. As presented, the proposal is still a bit vague about the precise locations of sites; further survey work is necessary before the mid-transect sites can be selected (some survey work is scheduled for 1989-90). Of the sites proposed, the SOHP ranks the Patton Murray Seamount site as highest priority. This area has been surveyed but the proposal reports only a cursory shipboard examination of the cores. We would encourage the proponents to follow up on these cores so as to better establish the appropriateness of this site. Based on existing documentation, we would select the Bettis Area site as an additional site for the transect but believe that even more appropriate sites may be found as a result of future survey work.

In summary, this proposal addresses many of the SOHP's highest priorities. We encourage the proponents to follow up on existing and future site survey data in order to more clearly demonstrate the appropriateness of the sites selected. Well-documented sites will be ranked very highly and incorporated into our first priority North Pacific transect.

11.3 287/E (Handschumacher and Vogt)

- A proposal to drill M-series anomalies. These sites are not located on oldest Pacific crust (no Jurassic where proposed) and therefore are of limited interest to the SOHP.

11.4 283/E (Jacobi et al.)

- A proposal to examine the influence of the Kuroshio Extension on sedimentation on the Abyssal Plain. The SOHP has a number of problems with this proposal:

  1. The sites are very deep (5800 - 6000 m). How will the brown clays be dated and sedimentation rates established?

  2. The program, as proposed, seems regional in nature and difficult to justify under our guiding themes. Questions of paleocirculation are critical in a global sense but more appropriately studied at passive margins.

11.5 Response to PCOM's CEPAC Directive:

The chairman and the PCOM liaison related the events leading to PCOM's CEPAC directives to the Panel. While the Panel realizes that planning must be done within some sort of time frame, we are quite disappointed to see that POLITICS and not SCIENCE appears to be determining these time constraints. The Panel could find no scientific justification presented by PCOM for limiting CEPAC drilling to 18 months. In fact, the 18-month limit was imposed before any science was presented. It was our understanding that PCOM was responsible for SCIENTIFIC planning and not POLITICAL decisions (these should be made at EXCOM). These arbitrary time limits only serve to propagate the circumnavigation philosophy that has so frustrated us in the past. We implore the PCOM members to place national interests behind scientific merit in making their decisions and thus allow the planning process to function as it should.

Despite the Panels abhorrence of PCOM's CEPAC actions, we are faced with a directive to which we must respond. Our approach to this response was to evaluate our CEPAC themes, see how the newly discussed proposals fit into our ranking of all CEPAC themes and proposals and then determined what a minimally acceptable SOHP CEPAC program would consist of.

Evaluation of CEPAC themes and new proposals:

After evaluating the three new CEPAC proposals brought before the Panel, our highest priority CEPAC themes remain unchanged (see minutes of Tokyo meeting - Appendix B). We reiterate that each of these themes focuses on critical sediment and ocean history problems and that we would like to see CEPAC drilling address all of them. Proposals 283/E and 287/E did not generate enough enthusiasm to change SOHP rankings. Revised proposals 247/E contains two sites, that if better documented, will be amongst SOHP's highest ranked sites.

Having reviewed all CEPAC proposals submitted to the SOHP to date and having reaffirmed our CEPAC themes, we set out to determine what a MINIMUM SOHP CEPAC Program would involve. The SOHP concurs with PCOM in their selection of our top four themes for a MINIMUM program and agrees that with the careful selection of sites some of these thematic objectives can be combined.

Theme 1: Neogene Paleoceanography: High-resolution surface and bottom water Neogene history of the Pacific and its relationship to paleoclimate, sea level and tectonic events.

This continues to be our highest priority theme for the Pacific. It is important to note that this theme is also well represented in the priority one recommendations of the COSOD II Working Group I. Both the SOHP and COSOD II Working Group I recommend a strategy of drilling transects (or arrays in the COSOD II document) to meet the objectives of this theme. We separate Neogene from longer time period problems because of the differences in the data available, resolution achievable and the overall drilling strategy for addressing higher frequency fluctuations. The COSOD II report presents well-documented arguments for the need for broad areal and depth coverage in order to understand the ocean system. To achieve this coverage, they recommend a total of 20 Neogene transects with 8 in the Pacific. We support this recommendation, but as a <u>MINIMUM</u> requirement for the Resolution's first visit to the Pacific we propose three transects and contend that Neogene Paleoceanography in the Pacific <u>cannot be studied</u> with less than these three transects. In order to look at surface water, deep water, and latitudinal (frontal) variations, we propose a MINIMUM requirement of: 1) a Western Pacific depth transect; 2) an eastern equatorial transect; and 3) a North Pacific transect.

The selection of sites for the western and eastern Pacific transects was quite straightforward. Two highly-ranked (by both SOHP and CEPAC) proposals (142/E - Ontong Java Plateau and 221/E - Equatorial Pacific paleoenvironments) directly address our highest priority themes and show very high potential for success. The Panel has had four proposals (195/E, 199/E, 247/E and 259/E) that are relevant to the Northern Pacific transect, and we reviewed three proposals in detail to see how (or if) sites could be combined to meet our primary objectives.

Our primary objectives for a North Pacific transect include:

1. Understanding global ocean circulation; the history of the oldest, O_2 depleted deep water.

2. Has deep water formed in the North Pacific?

3. Establish a detailed calcareous high-latitude stratigraphy.

4. The history of North Pacific surface waters and the Arctic Front.

5. Understand the onset of biogenous silica blooms and biotic species radiations.

6. The history of acolian and ice-rafted sedimentation in the North Pacific.

We believe that the objectives can be addressed with a transect consisting of the following sites:

Meiji 1 and 2 from 259/E
NW 1,3, and 4 from 199/E
PM1a from 247/E

Theme 2: Mesozoic-Paleogene Paleoenvironments

Ideally an SOHP program for Pacific Mesozoic-Paleogene paleoenvironmental studies would contain three components: 1) sites in the Bering Sea; 2) sites on the Shatsky Rise; and 3) sites on selected atolls and guyots.

Bering Sea: Of the proposed Bering Sea sites, Site BR1 on Sounder Ridge (proposal 182/E) with a paleolatitude of approximately 20^{o}N presents the best opportunity of recovering a well-preserved pre-Neogene section. Unfortunately, we have several concerns with the proposed site:

1. There is very thick turbidite sequence--drilling may not get beyond the Neogene.

2. The paleoposition of this site is uncertain.

3. It is not clear that 20^{o}N is a high enough paleolatitude for paleoenvironmental studies.

4. What is the effect of at least 1000 m of burial on the section.

Because of these uncertainties, we view this site as a high-risk site and in this light will not include it in our MINIMUM CEPAC program. We do, however, hope that the potential for Bering Sea sites to shed light on pre-Neogene paleoenvironmental problem can be better documented and, if so, will push strongly for their inclusion in a core CEPAC program.

Atolls and Guyots: Three proposals (202/E, 203/E, and 260/E) aimed at a variety of objectives have called for the drilling of atolls and guyots. In terms of a MINIMUM CEPAC program aimed at looking at pre-Neogene paleoenvironments, the SOHP proposes an E-W transect consisting of the following sites:

OS-3 (proposal 260/D) on Ogosawara Plateau at the western end of the transect to address problems of Cretaceous paleoenvironment where there is ample evidence of good carbonate preservation.

A 3-guyot transect consisting of Allison, Menard and Wilde guyots is proposed (from proposal 203/E). Along with problems of pre-Neogene paleoenvironment drilling, these guyots will address questions of sea-level fluctuations, the timing and causes of platform drowning, and the history of advance and retreat of platform margins.

Sylvania and Harrie Guyots (from proposal 202/E) drilling into the pelagic cap of each.

Shatsky Rise: provides low paleolatitude record of Mesozoic-Paleogene record with good bio- and magnetostratigraphy and the possibility of looking at paleowater mass data. Two sites are proposed (from proposal 253). These will be discussed further under Theme 4.

Theme 3: Sea Level - Atolls and Guyots

The use of atolls and guyots as "dipsticks" for studying sea level fluctuations has long been supported by the SOHP and has recently been endorsed by the COSOD II Working Group I. While the guyot drilling suggested above will address the questions of pre-Neogene sea level fluctuations, none of the proposed sites will address Neogene sea-level history. We encourage the atoll and the guyot proponents to compare paired atolls and guyots and to drill the margin of a living atoll to get at the Neogene sea-level history. We suggest Enewetak as a possible site for this work.

Theme 4: Anoxic Events

Shatsky Rise (proposal 253) is the preferred site for exploring anoxic events in the Pacific. A three-hole transect is proposed, but the SOHP believes that in a MINIMUM program the question of anoxic events can be addressed with two sites (SHAT 1 and SHAT 3). It is important to note that the ability to drill through interbedded cherts and chalks must be established before this can be a viable drilling program.

11.6 The SOHP MINIMUM CEPAC Drilling Program:

The SOHP has identified four high-priority themes (Neogene paleoceanography, Mesozic-Paleogene paleoenvironment, Atolls and Guyots: Sea-level fluctuations, and Anoxic events) to be included in a MINIMUM CEPAC program. Many of these themes can be addressed simultaneously and to do so, we propose the following drilling programs:

1. Western equatorial depth transect - Ontong Java Plateau - as in proposal 142/E - Neogene paleoceanography

2. Eastern equatorial transect - as in proposal 221/E- Neogene paleoceanography

3. North Pacific transect - Meiji 1 and 2 (259/E); NW 1, 3, and 4 (199/E), PM 1A (247/E) - Neogene paleoceanography

4. Atolls and Guyots - OS-3 (260/D); Allison, Menard and Wilde Guyots (203/E); Sylvania and Harrie Guyots (202/E); Enewetak (202/E) - Mesozoic-Paleogene paleoenvironment, sea level

5. Shatsky Rise - SHAT 1 and SHAT 3 (253/E) - Mesozic-Paleogene paleoenvironments, anoxic events

These five drilling programs make up the core of the MINIMUM SOHP CEPAC program. We emphasize that many of the proposed sites are HPC sites and that several of the proposed programs (e.g. Shatsky Rise) involve less than one leg's worth of drilling.

12. Next Meeting:

October 4, 5, 6 - Milan, Italy

13. Rotations and Liaisons:

Bob Embley, Phil Meyers, and Rick Sarg are scheduled to rotate off the Panel. We sincerely thank each of them for their services and suggest the following replacements.

To replace Embley - Roger Flood, LDGO; Bob Halley, USGS; P. Scholle, SMU

To replace Sarg - Tom Loutit, EPR

To replace Meyers - the Panel would like to add a paleoclimate modeller:
Eric Barron, Princeton
Judy Parrish, University of Arizona

Liaisons - IOP - Isabella Premoli-Silva
WPAC - Bob Garrison
CEPAC - André Droxler
(Meyers will attend next CEPAC meeting)

14. Other Issues:

14.1 G. Brass suggested that the SOHP should review cruise prospectus to ensure that final cruise plans reflect original intentions. The SOHP agreed with this and will do so in the future.

14.2 Logging: The SOHP reiterates its strong support for the logging program. We would like to see a better integration of the logging scientist with other members of the scientific party. We would also like to see an increased effort to improve the mode of presentation of the log data.

15. Arctic Drilling:

L. Mayer and G. Brass briefed the SOHP on the efforts underway to organize an international program for high Arctic scientific drilling. Options for various platforms and the proposal for a Centennial of the Nansen Drift (C.O.N.D.) being developed by J. Thiede (Germany), Y. Y. Kristoffersen (Norway), and L. Johnson (ONR) were described. Brass expressed concern over the perception by some in U.S. that Arctic drilling is of interest only to a small number of regional experts.

The SOHP was greatly disturbed by this perception. High Arctic drilling has long been a prime (though unattainable) goal of this Panel. It was cited in COSOD I as a primary objective and reiterated in COSOD II as a priority one goal. Even a small number of deep cores from the Arctic basins will revolutionize our understanding of, and ability to model global oceanographic and climatic problems. Arctic drilling is anything but a regional problem. Rather it may provide the critical inputs necessary to develop an understanding of the global ocean system.

The SOHP strongly supports the international effort for a high Arctic drilling program. We do not view this program as a competitor to ODP, but rather a necessary complement, that will only be accomplished with a dedicated and concentrated effort. We encourage the proponents of the high Arctic drilling program to work closely with ODP and its advisory structure and look forward to a successful project.

16. COSOD II:

The Panel had a long discussion of the COSOD II meeting and document. This discussion can be summarized as follows:

There was general disappointment and frustration over the structure of the meeting. There was a consensus that much of what would be produced was predetermined. We acknowledge the desire of the organizers to focus the program on exciting aspects of the science but this led to the exclusion of several high priority SOHP themes (sedimentology, metallogenesis and diagenesis).

In contrast to the meeting itself, the document produced was excellent. Of particular concern to the SOHP were the working groups whose mandates involved SOHP themes (Working Group I, Working Group III, Working Group V). We are particularly pleased with the report of Working Group I, which produced a very well focussed plan for addressing objectives that are totally consistent with the SOHP's highest priority themes. Our only concerns with the Working Group I report are the absence of any discussion of sedimentological problems (e.g. depositional manifestation of continental erosion and uplift history) and an apparent over emphasis of Neogene problems. We feel that it is quite relevant to point out that Working Group I attracted, by far, the largest portion of the community, clearly indicative of the global significance of these themes.

Working Group III more than adequately covered our concerns with hydrogeology but only implicitly dealt with problems of oregenesis, metallogenesis and sea-floor mineralization. Sediment diagenesis and global ocean chemistry seemed to have slipped through the cracks.

In contrast with Working Group I and Working Group III, there was general outrage with the results of Working Group V. We applaud the effort to bring paleobiologists into the program but the separation of the paleontologists from the paleoceanographers was unwarranted. The recommendations of this working group (aside from improved database statements) were unrealistic and unproductive. The working group report serves only to reinforce the notion that paleobiology problems cannot drive the drillship. Rather, the appropriate material for these studies can be readily collected in the course of addressing the global problems described in Working Group I.

There was also concern expressed over the push for a the second platform. The SOHP would rather see effort put toward developing cheaper long coring capabilities (e.g. GPC and wireline coring systems).

Contrasting COSOD II to COSOD I, we found that the COSOD I report was much more descriptive--a retrospective of what had been done and a shopping list of what we should do. COSOD II, with the benefit of a number of years of additional data, was much more focused and oriented towards the testing of specific models. This is a natural evolution in the development of a global drilling program and one that we applaud.

17. Long-term Planning:

With its final throws of exhaustion, the SOHP began the important task of long-term planning. As a guideline for this planning, we assumed a reasonable length of time available for drilling (i.e. several years) and <u>no regional constraints</u>. We then asked ourselves what major global themes would we address and how would we formulate a global program to attack these themes. We developed six themes:

1. Neogene Paleoceanography - Short period changes. (à la COSOD II) including Arctic and Southern Oceans

2. The history of sea level (à la COSOD II)

3. Longer period changes - the pre-Neogene paleoenvironment

4. Paleoupwelling and productivity

5. Diagenesis and paleochemistry

6. Depositional manifestations of continental uplift and erosion:

Working groups were formed and over the next few months these themes will be further developed. The fully developed themes will be presented in the form of a White Paper and submitted to the JOIDES Office for publication in the August JOIDES Journal.

EXECUTIVE SUMMARY

JOIDES TECTONICS PANEL MEETING
CORVALLIS, OREGON
15-18 MARCH 1988

Western Pacific

a. Celebes/Sulu

The goals of dating the basement of the Celebes and Sulu basins are of broad tectonic interest. Sites CS-1 and SS-1 address these goals, but Site SS4 is extraneous.

b. Geochemical reference sites

The Panel suggests sites (3-4 minimum) that can also address tectonic targets (Jurassic Quiet Zone and M-Series Dating, see Appendix to Minutes).

c. 1. Nankai second leg
   - the overall plan clearly addresses important thematic objectives. TECP sees the need, however, to review a more detailed proposal with more clearly defined objectives illustrated by clear seismic sections.

   2. Zenisu Ridge
   - views unchanged, TECP still questions uniqueness of site and dateability.

   3. ^{10}Be reference site
   - is not viewed as contributing significantly to TECP goals.

   4. Aoba (Vanuatu) intra-arc basin
   - immature.

   5. Self-boring pressureometer
   - To be encouraged but premature.

   6. Japan Sea bore hole seismometer (Proposal 155F)
   - endorsed in principle but with questions about specifics and trade-off with down hole time needed.

   7. Japan Trench-Nankai Trough Melange (Proposal 281D)
   - interesting but not thematically compelling.

d. South China Sea Margin (Proposal 46D second revision)

TECP is split (6 yes, 3 no, 3 abstain) on the thematic importance of drilling the South China Sea margin, but still willing to consider again the question of whether this is an important opportunity to further understanding of passive margins. There is also virtually unanimous disquiet about accepting 46D as it stands.

e. Lau Basin

TECP remains broadly interested in the program of Lau Basin drilling but does not strongly support a one hole fore-arc program.

Central and Eastern Pacific

a. TECP confirmed its top 5 thematic takings for CEPAC:

1. M-Series dating
2. Lithosphere flexure
3. Ridge-trench interaction
4. Pre-70 Ma plate motions
5. Deformation in accretionary prisms

The Panel suggests that Themes 1 and 4 can be addressed in relation to geochemical reference hole drilling (see above). Themes 2 and 3 await, respectively, an analysis of dating problems and detailed site information. At present the most interesting proposal for Theme 5 involves fluid circulation studies.

b. 1. Behavior of accreted and basinal sediments (Proposal 299F)
   - of thematic interest but immature.

2. Marquesas moat (Proposal 291E)
   - very high thematic interest but lacks supporting data.

Miscellaneous Proposals

a. Stresses in oceanic crust (Proposal 66F revised)
   - immature, a contribution to future planning.

b. Antarctic Peninsula margin (Proposal 297C)
   - high thematic interest but requires more data.

c. Ross Sea (Proposal 296C)
   - of interest particularly in interaction between tectonic and paleoenvironmental themes.

Planning

TECP White Paper on Global Themes for ODP will emphasize tectonic processes, particularly active ones. The White Paper will strongly emphasize measurement of parameters of tectonic significance and interaction with other programs. Priority topics (not ranked) are:

1. Plate kinematics - past and present
2. Dynamics of the lithosphere
3. Structure of deep crust and mantle
4. Rifted margin processes
5. Convergent margin processes

Target date: Submission to JOIDES Journal 9-1-88

DRAFT

JOIDES TECTONICS PANEL MEETING
CORVALLIS, OREGON
15-18 MARCH 1988

Panel Members Present:

Ian Dalziel (USA) Chairman
Roger Buck (USA)
Dan Davis (USA)
David Engebretson (USA)
Karl Hinz (FRG)
David Howell (USA)
Kenneth Hsü (ESF)
Robin Riddihough (Canada)
François Roure (France)
Peter Vogt (USA)
Graham Westbrook (UK)

In Attendance:

Greg Moore (WPAC)
Nick Pisias (PCOM)
Tom Shipley (PCOM)
Kensaku Tamaki (Temporary TECP replacement for Nakamura, Japan)

AGENDA

1. Preliminary introductions
2. Minutes of previous meeting
3. Chairman's remarks and up-date
4. Report from PCOM Chairman
5. Discussion of agenda
6. Report from liaisons (1)
7. Western Pacific (including proposal reviews)
8. Report from liaisons (2)
9. Central and eastern Pacific (including proposal reviews)
10. Miscellaneous proposal reviews
11. Long-range planning
12. Next meeting

MINUTES

Tuesday, March 15, 1988

1. New Chairman, Dalziel, welcomed new members Roger Buck and David Engebretson. Dan Davis kindly agreed to act as recorder for the Chairman.

2. Minutes of Previous Meeting

   Graham Westbrook noted that in the Executive Summary Section 2B Nankai the word "fluid" was missing before the word "composition". With this change, the minutes were unanimously adopted.

3. Report from PCOM

   PCOM Chairman Pisias reported plans for FY 89:

Leg 124	Banda (Co-chiefs Hinz and Silver)
Leg 124E	Engineering test leg
Leg 125	Marianas
Leg 127	Nankai
Leg 128	Japan Sea I
Leg 129	Japan Sea II

   and for FY 90:

   Four legs pretty well set --
   South China Sea Margin
   Vanuatu
   NE Australian Margin
   Lau Basin
   Three legs less well defined --
   Geochemical reference
   Nankai geotechnical
   Banda-Sulu

   For "planning purposes" Pacific Ocean was allocated 3 years. WPAC had 11 very strong programs and therefore went to 22 months; CEPAC has tentatively been assigned 18 months.

   Present allocation of 9 CEPAC legs:

   LITHP 4
   SOHP 3
   TECP 2 Flexure of Lithosphere and Chile Triple Junction

   PCOM Chairman has asked TECP to comment on this and to designate a third topic as a back-up "tectonic leg"

   Changes in Panel structure were discussed. TECP is to be maintained as one unified body.

   Safety problems were reported with regard to Exmouth Plateau drilling.

   Budget projections to 1992 ($40M) were reviewed.

4. Indian Ocean

Proposal Review

The proposal to return to Site 735B on the SW Indian Ocean Ridge was reviewed (Proposal 300B). Several questions were raised:

- How adequate was the original site survey?
- The survey still seems inadequate and insufficiently documented (particularly seismic reflection regarding nature of possible Moho reflection).
- Is the site really on "normal" oceanic crust (i.e., generated at the ridge)?
- What is the nature of the foliation on which the supposed listric normal fault interpretation is based and on which the comparison with St. Paul's Rocks is made?
- What other leg would need to be dropped? (Nankai cannot slip due to typhoon season).
- Reflector alluded to could be intracrustal, there are known culminations and depressions in magma chamber roofs along the strike of ridges.

Summary of Views: While drilling through Moho is not a stated objective of TECP it is of course an exciting prospect. The Panel is, however, unconvinced that there is a well established case that Moho can be reached at 735B and that the latter is not in an anomalous area. There is a serious need for survey data.

Motion -- TECP, for reasons stated, does not support an immediate return to 735B on the basis of the proposal submitted.

Vote in favor -- 11-0 with 1 absention.

5. Western Pacific

Question of Co-chiefs for WPAC legs was not discussed as PCOM Chairman had informed TECP Chairman that the necessary decisions had been made.

5.1 WPAC liaison, Greg Moore, reported. The comments of TECP were solicited particularly on Lau fore arc drilling and proposed Japan Sea bore hole seismometer.

5.2 Proposal Reviews:

After initial discussion of South China Sea drilling it was decided to postpone detailed discussion until after a review of the regional tectonic setting as reflected in proposals for Sulu and Celebes sites.

a. Karl Hinz (proponent) reviewed Proposals 292E and 293E.

Consensus (reached in absence of K. Hinz): The goals of dating the basement of the Celebes and Sulu basins is indeed of broad tectonic significance in understanding the geodynamics of SE Asia and the Panel supports them. Sites CS-1 and SS-1 do address these goals directly and should be drilled although there is need for more precise information on location (with respect to transform faults for example). Site SS-4 is tectonically exciting but extraneous to the main goal of the leg in question and could dilute seriously the efforts made in that direction. The Panel would be favorably disposed towards the drilling of a site for dating the inception of spreading in the southwestern South China Sea but is not satisfied with the data presented so far in support of SCS 5.

b. In response to PCOM's request for comments on tectonic objectives that could be addressed while drilling Geochemical Reference Holes, Peter Vogt presented an analysis of Proposal 267F (See Appendix 1).

Consensus: It appears that drilling as proposed in 267F can address requirements of Jurassic Quiet Zone and M-Series drilling (285E, 287E) while also acquiring the necessary material for geochemical reference. A minimum of 4 sites are required to meet the TECP goals.

Wednesday, March 16, 1988

c. Nankai drilling (Proposals 295D, 301D)

While broadly endorsing the goals of a second Nankai leg, the Panel emphasized the need for more documentation of the sites, particularly NKT 3 and NKT 5. Interpretations of the JAPEx line on which these sites are located in another proposal (see 281D below) raised additional questions about their significance. The need for the revised second Nankai leg proposals to be reviewed by the thematic panel as well as by WPAC was emphasized.

With regard to Proposals 298F and 155F, we believe that vertical seismic profiling is essential at sites such as those in the Nankai prism (298F) in order to obtain *in situ* velocity data, but the bore hole observatory proposal (155F) is more problematical. The Panel endorses it theoretically but has concern about the effects of currents on the reentry cone, of sea bottom and sea surface reflections, and of drilling disruptions on core stress considerations. What are the expected improvements in resolution anticipated from deployment of a bore hole instrument, and how long will data be recorded to compensate for the time expended in deployment?

Our views on Proposal 177D (Zenisu Ridge) are unchanged: The important point is not the thrust itself but the timing. We still question the uniqueness of the site and the dateability.

The proposal for a ^{10}Be ocean reference site (Proposal 289E) is not viewed as contributing significantly to our accretionary wedge mass balance concerns. We are not convinced that new sites are needed off the high ^{10}Be area of the arc.

The proposal for drilling in the Aoba intra-arc basin (Proposal 294D) to study ophiolite emplacement is immature. The copy we received does not have a well documented case for the drilling. In particular it lacks site data and makes us uncertain that the target can even be reached in the basin.

The proposal for a self-boring pressure meter (Proposal 299F) is interesting. We strongly encourage the development of tools like this for a variety of settings (not just Cascadia), but the proposal is premature in terms of development of the tool and possible deployment.

Consensus on Nankai Transect (Proposals 295D, 298F, 301D). The Panel addressed the question of whether a second Nankai leg is warranted within the framework of the above proposals, particularly 301D that provides an overview of the planned drilling. It was concluded that the plan does clearly address thematic objectives. Nankai is a well studies margin and a good "counterpoint" to the Barbados fore arc. There is, however, real need to come back to TECP, in addition to WPAC, with better data (i.e., seismic lines) and more clearly defined objectives, and answers to some important questions:

- Is there a major problem with BSRs and gas hydrates?

- How are the main sites located structurally on the profile?

- Is there a problem with sea mount collision (see Proposal 281D)?
- Is NKT1 far enough to seaward?
- Is NKT 3 on a thrust or merely a fold?
- What are exact goals of NKT5?
- What type of tools (e.g., packers, etc.) will be used?
- What about hole stability in a sandy section?

Overall TECP would like to see a better constrained program better illustrated on a seismic section.

d. TECP had a long discussion on the question of drilling the South China Sea margin (Proposal 46/D second revision). While recognizing that the proponents had considerably improved the overall rationale of the proposal there is still considerable disquiet about the overall goals. Finally the Question "Do we support the concept of drilling the South China Sea margin" received 6 "Yes" votes to 3 "No" votes, with 3 abstentions. On the Question"Do we endorse the double-revised Proposal 46D as it stands", TECP voted 0 "Yes", 8 "No" and 4 abstentions.

Consensus: These votes be conveyed to proponents with information that K. Hsü and K. Hinz are available (with TECP Chairman) for discussion. Half the Panel support the concept but there is still unanimous disquiet about accepting the proposal (46/D) as it stands.

Typical concerns centered around lack of certainty about the plate and kinematic setting (e.g., relationship to India-Asia "extrusion" tectonics) and the marginal basin setting (a "plus" to some and a "minus" to others).

At least two major concerns expressed at the previous TECP meeting went unheeded:

- Could two or even one hole not satisfactorily discriminate between different models?
- Proposed transect should not cross the extension of an inferred transform fault, albeit one of limited offset.

e. Proposal 281D (Japan Trench-Nankai Trough) is an interesting suggestion addressing an interesting problem but it is short on data as a proposal and expresses a doubtful idea for making volumetrically important melange material.

Consensus: An interesting problem but we do not see a clear idea of where it can be done properly and of what the drill will teach us.

f. Lau Basin

Consensus (as before): We remain broadly tectonically interested in the program of Lau Basin drilling but remain of the opinion that one hole in the fore arc during a program designed to mainly address the volcanic history is not going to prove of outstanding tectonic interest.

6. Central and Eastern Pacific

6.1 The Panel reviewed the ranking of CEPAC drilling themes arrived at during the September 1987 meeting in Celerina. It reaffirmed its intense interest in the top 5 themes but did not wish to devote any of the others to a higher status although noting that some might be drilled as peripheral to other projects.

Thus in response to PCOM's question of TECP's ranking in CEPAC, we strongly urge that PCOM plan a drilling program that addresses all of the following themes:

1. M-series dating
2. Lithosphere flexure
3. Ridge-trench interaction
4. Pre-70 Ma plate motions
5. Deformation in accretionary prisms

The Panel took note of PCOM's letter concerning TECP priorities and the fact that PCOM specifically requested:

a. Comment on the assignment of items 2 and 3 above as the target of specific tectonic legs in a CEPAC drilling program; and

b. Identification of an alternative topic for a "tectonic leg". Rather than follow this line of thinking TECP prefers to restate the reasons for continuing to regard the above 5 themes as being of the highest tectonic priority for CEPAC drilling, and to suggest that at least 3 of them are of broad interest and should be planned in the context of multipurpose legs.

M-Series Dating and Pre-70Ma Motion

TECP restates the vital importance of these topics for the earth sciences in general. They represent critical constraints on the overall reference frame of plate tectonics and have major importance for sea level changes, the orogenic and magmatic history of continental margins, and almost all tectonic problems of a global scope.

These two themes can be addressed in a program to drill in the western Pacific for geochemical reference sites and the appendix by Peter Vogt (see also section 5b) analyzes such a program. TECP is also requesting CEPAC to re-evaluate Proposal 280/E in this regard.

Lithospheric Flexure

TECP still believes the study of flexure in the oceanic lithosphere is of the highest priority. Of the two proposals to address this problem (3E and 291/E) the former (Hawaiian moat) is preferable in the sense that the setting is "cleaner" (i.e., away from fracture zones). What is urgently needed is an analysis by the proponents of how the main thrust of the proposals is affected by the likely difficulty in obtaining dating for the past 2-1/2 million years at a satisfactory resolution. The Panel understands that D. V. Kent has analyzed the situation from the dating point of view for SOHP. The proponents need to "get back" as soon as possible on this one.

TECP notes that this theme is on the list of global thematic priorities in the LITHP White Paper and is therefore not of thematic interest solely to TECP as indicated by PCOM.

Ridge-Trench Interaction

TECP continues to regard this theme very highly. An up-date by Graham Westbrook of Steve Cande's recent R/V *Robert D. Conrad* cruise at the Chile rise-trench triple junction (for Site Survey in connection with Proposal 8E) gives grounds for optimism that suitable drill sites for addressing the main tectonic issues will be identified once MCS data are processed. The proponent is urged to get a revised proposal submitted as soon as possible.

Deformation in Accretionary Prisms

While the results for the Nankai Trough drilling will influence to some extent plans for future accretionary prism drilling, it is clear that the eastern Pacific offers many opportunities to pursue the important goal of understanding tectonic accretion (and erosion) at convergent margins:

> Vancouver margin to penetrate the décollement and investigate underplating (237E at 1.5 km); Oregon margin (233E) for hydrogeologic investigations; Andean margin (8E) for erosional, trench-ridge and trench-fracture zone interactions, Cascadia (277E) for aseismic slip -- to name but a few. The hydrogeology objectives for the Oregon margin are of greatest immediate interest the TECP given the importance of fluid circulation at convergent margins.

6.2 Proposal Reviews

Proposal 224E Drilling on the Escanaba Trough/Gorda Rise was not rated as being of high thematic interest to TECP.

Proposal 299F To study the behavior of accreted and basinal sediments was rated as being of thematic interest but is immature.

Proposal 291E To study the most of the Marguesas Island chain is of very high thematic interest (see Section 6.1) but the tectonic setting of the Marguesas chain is not as well known as that of the Hawaiian chain. Also the proposal lacks supporting geophysical data.

7. Miscellaneous Proposals

Proposal 66/F (Revised) to measure principal stresses in the oceanic crust is of high thematic interest. It clearly meets objectives stressed by COSOD II and should be considered with other proposals in considering how to proceed with *in situ* stress measurements. There appear to be problems with regard to core orientation measurements.

Proposal 297/C for studies related to ridge/trench interaction along the Antarctic Peninsula margin is of high thematic interest to TECP. The evidence of uplift is not, however, clear to all Panel members and the "drillability" and "dateability" of the glaciogenic(?) sedimentary apron are of considerable concern. The proponents are encouraged to resubmit addressing these questions as well as supplying additional data (many seismic lines are now available from this margin).

Proposal 296/C for drilling in the Ross Sea area was judged to have its main value in the interface between tectonic and paleoenvironmental themes rather than on the tectonic themes alone. Most of the tectonic themes can be addressed in other parts of the world. TECP is very sympathetic to this proposal as one with very broad interest. More information on the tectonic objectives (e.g., uplift of the Transantarctic Mountains) and how they would be addressed by the drill is needed from the proponents. The proposal is recommended for SOHP consideration in particular because of its Antarctic ice/climate implications.

Thursday, March 17, 1988

8. Medium-Long Range Planning ("beyond CEPAC")

The Panel spent the whole day on broad discussions of priorities for future tectonic drilling in the light of the COSOD II Report, especially the recommendations of Working Group 3 (Fluid Circulation) and Working Group 4 (Stress and Deformation in the Lithosphere). It was agreed that the TECP White Paper on Global Thematic Priorities should be based on the following:

Goal To identify major problems related to tectonic processes that ocean drilling should be addressing, and to develop recommendations on the drilling strategies and technical development required to carry out this drilling.

Background Prepared after COSOD II and reflecting the Tectonic Panel's view of how ODP should move forward addressing the main tectonic problems identified therein as well as others the Panel regards as being of pressing importance to understanding the tectonic evolution of the continents and ocean basins.

Emphasis Tectonic processes, particularly active processes only addressable with the drill at sea.

New Thrusts

Measurements of parameters of tectonic significance

Interaction with other major programs in the earth sciences.

Priority Topics (not ranked)

- Kinematics of present and past plate motion.
- Dynamics of the lithosphere.
  a. Interplate stresses and the driving forces.
  b. Plate boundary stresses and deformation.
- Structure of the deep crust and of the mantle.
- Processes leading to the development of rifted continental margins.
- Processes at convergent plate boundaries.

It was acknowledged that there is need to interact with others (for example Workshop Convenors) in preparing the White Paper. The goal is to have a first draft prepared by mid-June 1988 and the final version ready for the JOIDES Journal by September 1, 1988.

9. Next Meeting

The next meeting of the Tectonics Panel will be in Hannover, West Germany, during the week of October 3-7, 1988 subject to PCOM approval.

Geochemical Reference Holes on old Pacific crust east of the Marianas/Bonins arcs:
Positioning of Drill-sites to satisfy "M-Series Dating", "Magnetic Amplitude Variation", and "Jurassic Quiet Zone" objectives

P. Vogt (3-14-88)

(1) According to its 14 Dec 87 letter to TECP,

> "PCOM is considering drilling "Geochemical Reference" holes for the Bonins and Marianas. As proposed by LITHP, this would require one and a half legs of drilling. It is possible that this drilling can also address objectives of "M-Series Dating" and "Old Pacific Drilling". PCOM would like your input as to the positioning of proposed geochemical reference holes (Proposal 267/F) in the Bonin and Marianas area which can also address other tectonic issues."

(2) TECP should enthusiastically (a) endorse these "Geochemical Reference Holes", (b) suggest that at least two complete legs be devoted to them, and (c) provide PCOM with sites which provide the geochemical reference holes (as defined in 267/F) while achieving the objectives of "M-Series Dating" and "Old Pacific Drilling". (The latter is here equated with crust of the Jurassic Magnetic Quiet Zone (JMQZ), nominally everything older than anomaly M-25).

In its tentative 18-month drilling program for the eastern and central Pacific (14 Dec 87 letter) PCOM excluded any M-Series/Old Pacific drilling, even though these topics were highly ranked by TECP and satisfy various LITHP and SOHP objectives. So, the geochemical reference holes seem to be the only opportunity to address M-Series/Old Pacific problems.

3. Following are the pertinent recommendations of 267/F:

(a) Because the integrated crustal alteration history of fast-spreading crust has never been investigated through drilling, we propose that a major multiple re-entry hole be drilled on an identifiable M-Series magnetic anomaly in the western Pacific, that this hole be drilled to 500m depth into basement, and that a full logging/seismic program be devoted to study of such a hole.

(b) To relate the compositions of subducted sediment and ocean crust to arc systems that will be subject to multi-leg drilling efforts in the western Pacific, we propose drilling at least five single-bit holes through the sediments into ocean crust up to bit destruction, east of the Bonin and Mariana arcs. The five targets are necessary to investigate the range of materials being subducted and to have holes in front of both these geochemically distinct arcs. The holes would be: (1) one hole for each arc drilled into ocean crust away from incoming seamounts and through a pelagic sediment cover; (2) one hole for each arc drilled into distal portions of volcaniclastic aprons derived from large seamounts, which make up an important component of the Pacific plate in this region; (3) one hole placed on the summit of a seamount, to be drilled through its sediment cap and well into basement. This sequence of holes should provide some sampling of each principal component involved in subduction, and a series of shallow basement composition to compare with the deep multiple re-entry hole put into Pacific crust nearby. These holes could also provide significant regional information concerning the history of western Pacific ocean crust, seamounts, and Cretaceous paleooceanography.

Obviously, there would be distinct advantages to combining the deep penetration objectives with the arc-specific objectives, and one of the single-bit holes could also be the deep hole. Although we believe that a single package encompassing all these objectives would have the greatest scientific benefit, we consider that the regional (arc-related) objectives could be accomplished with the suite of single-bit holes, and that there could be flexibility in assigning the location of the deep site. In view of logistical considerations (ship track, ease of return site, regional priorities) this is an important consideration. For these reasons, the re-entry site could be physically remote from the Bonin/Mariana arcs if necessary, but it should be within the M-Series magnetic lineations that characterize the spreading rates and general crustal history of material now being subducted in the western Pacific.

4. Seamount/apron Objective: PCOM has already assigned 1 leg to the "Ogasawara Plateau" (260/F) located seaward of the southern Bonin arc. The "Ogasawara Plateau" drilling includes guyots (seamounts), a broader aseismic ridge, and archipelagic aprons. This satisfies the "seamount" and "apron" geochemical reference hole objective for the Bonin arc.

In addition PCOM endorsed proposals 202/E (Drowned Marshall guyots)and 203/E (Central Pacific guyots) which although unsatisfactory for the purpose of dating Mesozoic Pacific hotspot traces should also provide geochemical reference hole information - particularly if the ages and compositions turn out to be similar to the Ogasawara Plateau edifices.

Note however that 202/E, 203/E, and 260/F all target large edifices. It may be that these are volumetrically and compositionally most important for the down-going slab's contribution (if any) to the arc magmas. However, the far more numerous smaller edifices are not represented in these proposals, raising the possibility of biased sampling. (Proposal 280/E, "Drilling the Cretaceous-aged Geisha seamounts and Guyots in the Western Pacific" did include smaller edifices but his proposal did not meet PCOM approval).

As regards the Marianas arc, there are two guyot/seamount complexes, the Dutton and the Magellan seamount clusters, conveniently situated not far east of the Marianas Trench. U.S. Navy multibeam data are published for the Dutton seamounts and will soon be available for the Magellan seamounts. A drillsite on the summit of one or more guyots would satisfy the "Geochemical Reference Hole" objective while providing valuable sea level/carbonate bank/guyot formation data for the eastern end of the Mesozoic guyot province. The authors of proposal 280/F would be willing to write a proposal for the Dutton/Magellan edifices if there is a reasonable chance the sites will be accepted.

It is possible that the "archipelagic apron" sampling could be combined with Old Pacific crustal sampling (Sites 1, 2, 3, and 6 of proposal 285/E, "Jurassic Quiet Zone, Western Pacific") if the crustal sites are situated to sample the thinner, distal portions of the aprons on their way to basement.

(5) Basement Sampling: In situating drill-sites to sample what is being subducted under the Marianas-Bonin arcs, attention should be focussed on the geometry of crustal isochrons and fracture zones seaward of the arc. The age of the crust presently entering the Bonin Trench ranges from about M-20 (Tithonian) to M-10 (Hauterivian). The age of the crust presently entering the Marianas Trench ranges from about M-20 in the north to pre-anomaly 29 (Callovian-Bathonian?) in the south. In general the crust gets older with increasing distance east of the trenches. Therefore the characteristics of the crust just entering the trench at any site is not identical (although probably close) to what has already been subducted.

From the general isochron pattern it is apparent that crust of the type already subducted at any point on the arc can still be sampled to the northeast where it has not yet arrived in the trench. For both, the geochemical reference hole and Old Pacific/M-Series sampling it is not critically important to place the drillsites immediately seaward of the trenches.

Although proposal 267/F did not mention fracture zones, they too should be sampled for Geochemical Reference Hole purposes. Note that fracture zones are not entering the Marianas and Bonin trenches at right angles as for the Aleutian arc. If arc volcanics are influenced by "fracture zone crust," perpendicular entry would provide a better test. However, if the average composition of the subducting crust is to be assessed, fracture zones cannot be left out, particularly for the Bonin arc where a number of fracture zones are being subducted parallel to the trench.

Geochemical Reference Hole sampling east of the Bonin arc can be combined with M-Series dating and magnetic amplitude calibration (Proposal 287/E, "Deep Drilling in the M-Series, Western Pacific"). As a minimum, drillsites A2-1 and A2-3, both located on anomaly M-18 of the Japanese lineations, would establish the age of this chron and the difference in composition between the "high magnetic amplitude" crust. Whether the amplitude difference (a general feature of the M-Series in this region!) reflects a primary compositional or structural difference or a secondary difference related to differential alteration, this pair of drill-sites offers the opportunity to calibrate an easily measurable geophysical characteristic which can then be used to map crustal structure, composition, or alteration. One of the two sites should be chosen as the 500m deep site proposed in 267/F. The location is on a well-defined magnetic lineation, in an area well-mapped magnetically and bathymetrically, and having an age intermediate between the youngest crust subducted under the northern Bonin arc in the last 10 My, and the oldest crust subducted under the Marianas arc.

Several different candidates for sites for the old Pacific crust seaward of the Marianas arc could be chosen from sites JJ-1 through JJ-6 (Proposal 285/E). Each site has its own advantages, and the drilling of two sites is highly desirable.

Site JJ-5 will date what is probably the oldest Pacific crust, and is exciting from that viewpoint alone. Although this is older (perhaps by 10 to 20 m.y.) than crust subducted under the Marianas arc, basement composition will provide an end-member. (Probably there is little or no significant age-dependent difference between 150 and 170 Ma crust anyway).

Site JJ-3, on Handschumacher's "M-38", is valuable as a calibration tiepoint for the oldest recognizable magnetic lineation. A similarly aged site could be found in the area of JJ-6 based on the new anomaly identifications there (K. Tamaki, personal communication).

⊙ COMBINED W. GEOCHEM REF. SITE OBJECTIVES 260F, 285E
(267/F) 287E

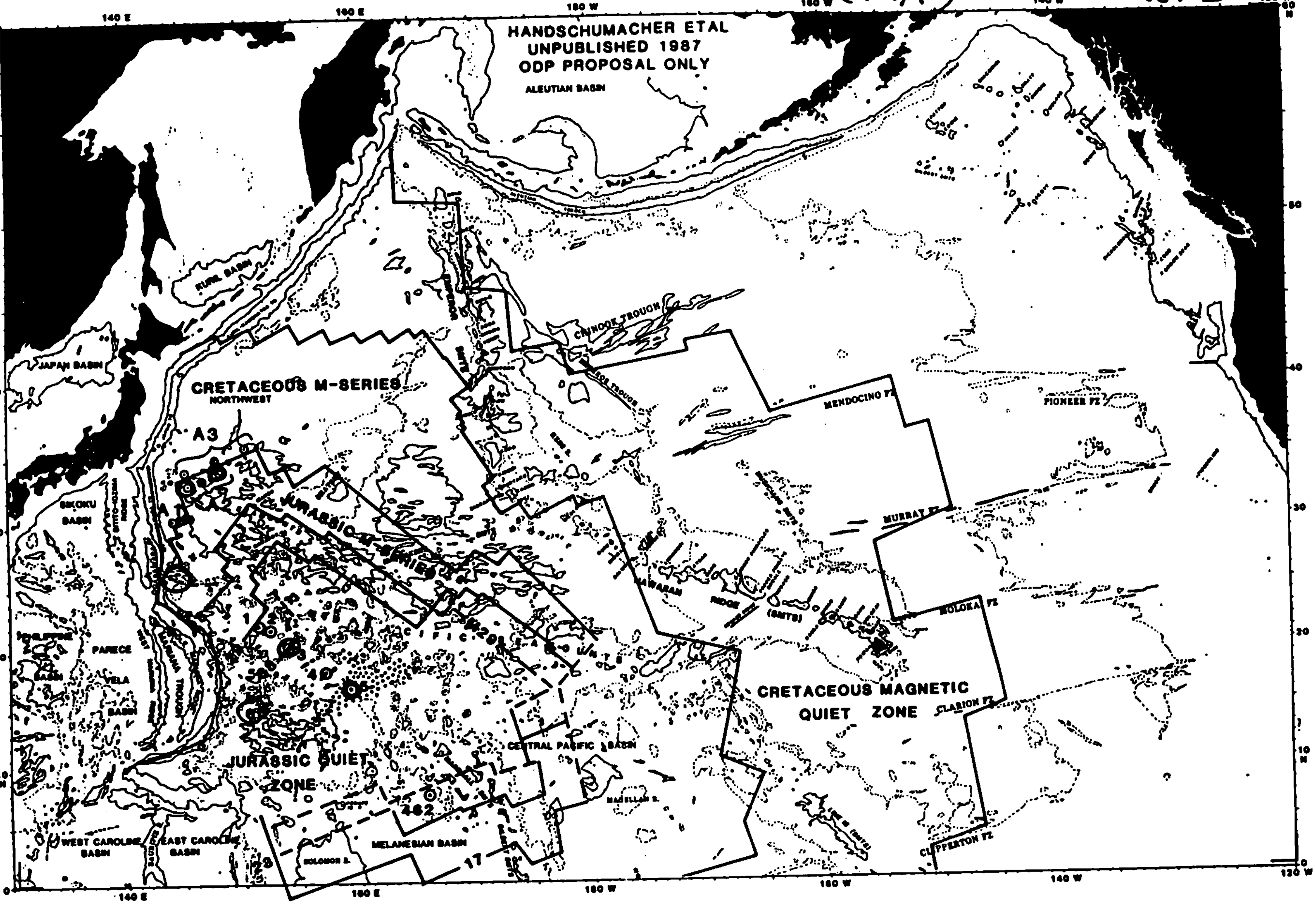


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FIG. 1

⊛ COMBINED WITH GEOCHEM REF. SITE OBJECTIVES

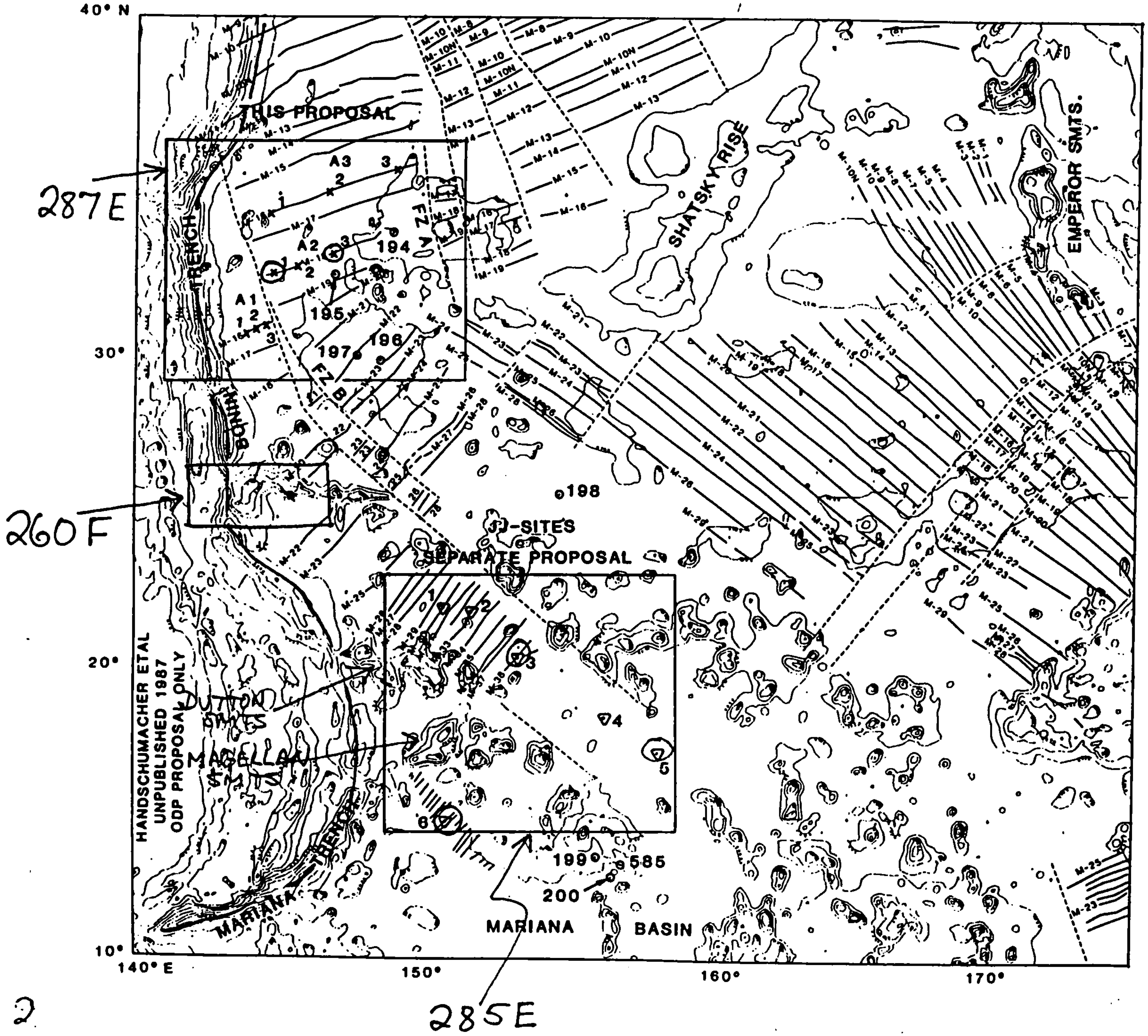

FIG. 2

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OCEAN DRILLING PROGRAM
SITE SURVEY PANEL MINUTES

Lamont Doherty Geological Observatory
Palisades, New York

March 15-17, 1988

Present:
John Peirce* (Chairman, Canada)
Fred Duennebier* (USA)
John Jones* (UK, alternate for Kidd)
Steve Lewis* (USA)
Alain Mauffret* (France)
Heinrich Meyer* (Germany)
Greg Mountain * (USA, incoming Chairman)
Kiyoshi Suyehiro* (Japan)
Carl Brenner (ODP Data Bank)
John Ladd (soon to be at NSF)
Marc Langseth (PCOM liaison)
Bruce Malfait (NSF)
Audrey Meyer (TAMU)
Brian Taylor (WPAC)
Michael Wiedicke (JOIDES Office)

Regrets:
Birger Larsen (ESF)
Tom Pyle (JOI)

**Panel members*

1. PRELIMINARY MATTERS

The Chairman welcomed Greg Mountain as a new panel member and as incoming Chairman.

Denny Hayes welcomed the SSP to Lamont.

There were no changes to the minutes from the last meeting.

National ship schedules were brought by all representatives and are attached as Appendices A-F.

2. REPORTS

A. PCOM (M. Langseth)

Indonesian clearance for Leg 124 is viewed as a potential problem. June 3 is the drop date if clearance is not obtained.

The tentative 2nd year of WPAC drilling is

- Nankai II
- Reference Sites (BON-8 and MAR-6)
- South China Sea Margin
- Northeast Australia
- Vanuatu (DEZ 1-5 and IAB 1A, 2A)
- Lau Basin (No guide base, include forearc site).

TAMU has requested a second engineering leg in the Lau Basin to test drilling in fractured basement rock.

The tentative CEPAC program is attached as Appendix G and watchdogs listed.

The discussions on the restructuring of panels were reviewed. The subcommittee report goes to PCOM in April and then to EXCOM.

B. TAMU (A. Meyer)

At its meeting last week, PPSP rejected Exmouth Plateau sites EP-6, 7 and 12, while approving sites EP-2 and 11. Sites EP-9 and 10 were approved with the following guidelines:

1) a number of seismic lines must be shot across EP-9 by the JOIDES *RESOLUTION* during the first NW Australia leg; and

2) EP-10 can be drilled on the second leg only if EP-9 is completed without major indications of gas.

A further meeting of PPSP will be held on April 5 to see if alternative sites ("twins" to dry industry wells?) can be salvaged.

On the Engineering Leg (124E), TAMU will probably sail a "science advisory board" of 4-6 scientists with shipboard experience.

Results of Legs 116-119 and the beginning of Leg 120 were presented.

In reviewing the TAMU action items from the previous minutes, the following points were made.

1) The Navidrill was successfully tested on 118 and will be tested again on 121.

2) TAMU is strongly encouraging inclusion of site survey chapters in Volume A. Accomplishing this is sometimes limited by having only one free back pocket foldout in each Part A. There was an inconclusive discussion on the extra money needed to best display site survey results in Part A.

3) Underway Geophysics

A letter received by A. Meyer from Alan Cooper (USGS), who was the geophysicist on Leg 119, outlines numerous recommendations for improving underway geophysics on the JOIDES *RESOLUTION*. Many of these recomendations are precluded by the lack of money for new equipment and others by a lack of sufficient availability of marine techs.

ACTION: DUENNEBIER to read Cooper's letter and provide A. Meyer with comments. (completed at meeting)

C. JOIDES OFFICE (M. Wiedicke)

The JOIDES Office moves to Hawaii on October 1, 1988. Ralph Moberly will be the new PCOM Chairman. The non-U.S. liaison is Laurent D'Ozouville from France.

D. ODP DATA BANK (C. Brenner)

Brenner distributed the FY'87 report on Data Bank activity.

The Data Bank budget for FY 87 was $198K. For FY 88 the budget is $204K. For FY 89, the budget is projected at $208K.

The microfilm reader, which has been sought by the Data Bank for some time, is being bought by the JOI Special Projects fund.

Data storage needs at the Data Bank are considered adequate through the CEPAC drilling.

E. CEPAC REPORT (A. Mauffret)

The last CEPAC meeting was in October.

The EPR Working Group has met and reported to LITHP.

The USSAC-funded EPR synthesis is expected to be completed this summer. Three copies of this synthesis report will be produced, one of which will go to the Data Bank.

An aeromag survey (Tamaki, Kobayashi, Handschumacher and Sager) is reported to have found anomaly M-38 in the Pigafetta Basin. Reportedly there were no sills detected in this area on the Larson/Shipley cruise. The survey was cut short by equipment problems - the undone portion in the Nauru Basin may be done on *WASHINGTON* as an SCS program. Other ODP site survey cruises for 1988 include:

1) Chile Triple Junction (Cande on *CONRAD*) Acquired 1800 miles of MCS data and 100% SeaBeam coverage.

2) Hawaii Moat (Detrick on *WASHINGTON*, ETD May 17) High resolution seismics planned. Chronologic reolution question is still left open. The USGS Gloria surveys on *FARNELLA* reportedly collected digital SCS on a wide grid.

ACTION: Lewis to get copy of *FARNELLA* cruise reports and track charts pertaining to Hawaii moat for Data Bank.

3) W. Pacific Atolls (Schlanger on *WASHINGTON*, 4-5/88); will include SCS, SeaMarc, magnetics and dredging.

4) NW Pacific Hotspot (Lonsdale) and NE Pacific Meija Sediment Drift (Keigwin) (both on *WASHINGTON*, 8/88).

5) W. Pacific Guyots (Winterer on *WASHINGTON*, 11/88).

6) Ontong-Java Transect (Winterer on *WASHINGTON*, 12/88).

3. SITE SURVEY ASSESSMENTS OF SCHEDULED LEGS.

A. 121 - Broken Ridge/Ninetyeast Ridge (Weissel/Peirce)

The Broken Ridge sites were reviewed by Weissel in light of the results from Leg 119.

The Ninetyeast Ridge sites were reviewed by Peirce.

All sites on Leg 121 are approved by the SSP. The site survey matrix is attached as Appendix H.

B. 122 - Exmouth Plateau

Further discussion of this leg was irrelevant given the PPSP decision of last week.

C. Leg 123 - Argo Abyssal Plain (Brenner)

All data for AAP1B is at the Data Bank. For AAP2 there is a potentially serious discrepancy between the plotted magnetic anomalies and their published interpretation. This appears to be a timing error in the merged data tape, but it is critical as AAP2 is positioned on M25.

ACTION: PEIRCE/BRENNER call Gradstein, Hiertzler, and WHOI to insure that a plan of action is agreed upon to resolve the discrepency between the plotted magnetic anomalies across Argo Abyssal Plain and their published interpretation.

D. Leg 124 - Banda/Celebes/Sulu/S. China Sea Basins (H. Meyer)

A table of site locations and data was distributed by B. Taylor to correct previous ambiguities arising from typos and other errors. It is attached as Appendix I.

1) Banda Sea

On February 29 the *DARWIN* surveyed an 18 mile long SCS line, oriented NE/SW, over BNDA-1 and a 40 mile long SCS line, oriented NW/SE, over BNDA-2, and a short line over BNDA-3.

ACTION: JONES to get Masson to send copies of *DARWIN* data and track chart over BNDA 1, 2 and 3 to H. Meyer, C. Brenner, A. Meyer and B. Taylor ASAP. Brenner to send data presently in Data Bank to H. Meyer in time for WPAC meeting.

Previously planned and funded site surveys for this area foundered because of the lack of Indonesian clearances. On the currently available data BNDA-1 is not drillable from a site survey perspective because the complex basement is very poorly imaged. The basement at BNDA-2 is more clearly imaged and the SSP feels that there is adequate data to drill it even without the *DARWIN* data.

Seismic refraction data are not considered essential to these sites because the availability of the minicone makes exact depth determinations a low priority need.

Sediment isopach maps are needed for both areas.

ACTION: H. MEYER will review *DARWIN* data with WPAC at their April meeting. He will complete a site survey matrix and send via Telemail final recommendations regarding BNDA-1 to G. Mountain for review and transmission to PCOM before their meeting in mid-April.

2) Celebes Sea

The CEL-1 site survey data were reviewed. The matrix is attached as Appendix ~~I~~ I. This site is approved by the SSP.

3) Sulu Sea

Site 5A on line 7 appears to be undrillable because of indications of gas migrating out of the trench. At the moment there is no map at a useful scale of core locations, heat flow locations, or bottom photography stations.

Proposed site SS2 on line 4 also seems to be a high risk site as there are several features on the seismic line which can be interpreted as gas indicators.

Proposed site SS3 on line 5 is separated from the trench by a basement ridge which appears to interrupt potential migration paths from the trench. The seismic line does not appear to have the same possible indications of gas (as noted on line 4 above) near the SS3 location. However, the seismic grid is wide (20-30 miles), the geometry of the ridge is uncertain, and its effectiveness as a block to possible migration is equally uncertain.

Although there is enough data in this area for scientific purposes, in order to convince PPSP that a safe site can be found the following additional work needs to be done near the proposed site SS3:

a) A detailed depth to basement map is needed, incorporating SeaBeam data to get some sense of the strike of outcropping ridges. There appears to be no SCS tracks in the area which can help constrain the strike of the ridge near SP 2800 on line 5.

b) Maps of all available station data in the area are needed at a useful working scale.

c) A core is needed at the proposed location.

d) Bob Thunell (U. South Carolina) will be running a coring cruise in the area on *MOANA WAVE*. Fred Dunnebier telephoned Thunnel during the meeting, and when asked Bob said he would be willing to spend about a day acquiring analog seismic lines on either side of line 5 to confirm the strike length of the isolating basement ridge and a cross line across the site. The cruise is scheduled for Aug. 88.

e) Mountain has written Thunell a letter specifying the positions of these lines, and that letter is attached as Appendix K. If PPSP meets before the cruise departs, their conclusions may significantly affect the need for this additional data.

4) South China Sea

Site SCS-9 is planned to confirm the age of magnetic anomaly 6. WPAC wishes to move the site onto either line BGR 17 or 18. In order to accomplish this at their next meeting, it is necessary that the magnetic profile be plotted at the same horizontal scale as the seismic data even if the final magnetic corrections are not yet ready.

ACTION: **H. MEYER will work with BGR staff to plot magnetics plotted at seismic scales for site SCS-9 before the WPAC meeting. At that meeting he will complete a new site survey matrix for sites SCS-9 and SCS-5B to be hand carried by Pisias to PCOM, and also forward them by computer mail to Mountain. MEYER will also expedite sending SO-49 magnetics to ODP Data Bank.**

Site SCS-5 was originally placed on the axis of the extinct spreading center in the SW China Sea. Site SCS-5B was chosen to place the site in Philippine waters to minimize clearance problems. It is placed on a LDGO MCS/SeaBeam/heat flow profile where crossing SCS and ESP's are available.

The SSP approves sites SCS5-B and SCS-9, assuming that the plans above are carried out without difficulty.

The only data not resident in the Data Bank are the SO-49 magnetics.

E. Engineering Leg 124E, Manila-Guam, December, 1988 (A. Meyer)

1) 8000 m W.D. site

Objectives: Test APC coring and positioning capability with nearly full drill string deployed. Also test bending stress on pipe.

Requirements: 8000 m W.D. Sediment thickness and type not important, but need to avoid sites where Cretaceous chert is exposed at surface in order to spud in without difficulty.

The best chance seems to be in the axis of the Marianas Trench, but there are no records showing unequivocal evidence of sediment there near Guam.

ACTION: **DUNNEBIER will be crossing Marianas Trench axis at location of potential deep-water engineering test site twice next month on *MOANA WAVE*. He will send profiles to A. Meyer with copies to the Data Bank.**

2) Test of rented mining system

Requirements: Desire 50-200 m of sediment over a basalt section. T.D. of hole should be 1000-1700 m. Limits are positioning stability for shallower depths and specs of drill rod strength for deeper depth.

Possibilities:

a) Seamount 853 was surveyed for IPOD, but probably basement depth of 2150 m is too deep.

b) Forearc may offer some sites.

c) Caroline Ridge is possible. Japanese may have data there.

ACTION: **SUYEHIRO will look for Japanese data on Caroline Ridge for Leg 124E and feed back to A. Meyer**

3) XCB/Navidrill/Logging Tests

Objectives: Series of side by side holes to test different operating parameters and compare core recovery. Section with alternating hard/soft sediments would be ideal. Logging wants to test BHTV and perhaps packer, so they need consolidated sediments.

Possibilities:

a) Perhaps Patty Fryer knows of some serpentine diapirs which are shallow enough.

b) Over Benham Rise, just east of Luzon, LDGO MCS lines C2006 and V3613 may offer possibilities.

Summary: The SSP does not need to formally review these sites, but we stand ready to assist in whatever way we can.

F. Leg 125 - Bonins I (Duennebier and Taylor)

1) Sites MAR 3 and 3A on Conical Seamount.

Active venting of cold water was discovered in ALVIN dives by Fryer. Seamount is a diapiric feature made up of serpentinite derived from mantle of upper plate being mobilized by dewatering of subducted slab.

Seismic is unsuccessful at imaging any internal structure to these diapirs.

Stoffers (Kiel) will take a core here this summer on SO-57.

With the exception of this core, all necessary data are at the Data Bank

2) BON-7

Similar flow features are seen on SeaMarc on this serpentinite constructional feature as on Conical Seamount. Adequate data are available for drilling.

3) BON-6

Final site position not yet chosen by WPAC, but adequate data is available for optimizing location and drilling. Adequate cores are available in area if reentry is needed.

All Leg 125 sites are approved by SSP, subject to the core being taken at MAR 3.

ACTION: **DUENNEBIER prepare site survey matrix for Leg 125. Included as Appendix L.**

G. Leg 126 (Taylor)

1) BON 5a/5b.

Sites near and in canyon to sample complete forearc section.

Some spudding in problems may be encountered at Site 5b if hard sands are present on floor of canyon. If so, hole can be moved to edge of canyon.

New seismic and SeaMarc data need to be deposited at the Data Bank.

2) Sites 1/2

In forearc rift and adjacent to it. There is concern that high temperatures may be encountered at site BON-1.

ACTION: SUYEHIRO contact Nishi Mura of the GSJ and forward heat flow data (paper/preprint?) by courier to M. Langseth for review. LANGSETH and MOUNTAIN make recommendations prior to WPAC meeting in April. There may be some chance for a detailed heat flow profile by the GSJ.

3) BON-3 and 4 are adequately supported by available data.

Summary: SSP approves sites BON 2, 3, 4, 5a and 5b.

ACTION: DUENNEBIER to complete matrix for Leg 126 sites for inclusion in minutes as Appendix M. SUYEHIRO to ask GSJ for a set of selected core descriptions near planned sites for submission to Data Bank to provide background info for TAMU engineers. Any failed coring attempts because of hard bottom are especially important to know about.

H. Leg 127 - Nankai (Suyehiro)

Reviewed new data.

SSP approves sites NKT - 1, 2, 3, 5.

ACTION: SUYEHIRO to coordinate submission of SSP profiles (ESP's shot with one ship held stationery in strong current) to ODP Data Bank.

I. Legs 128/129 Japan Sea (Suyehiro)

As many of the proposed sites in the Japan Sea may raise concerns with PPSP, because of the possibility of shallow gas, **the SSP strongly recommends that the nominated Co-Chiefs (Suyehiro and Tamaki) seek an early review by** PPSP in order to forestall last minute planning surprises.

Site Jlb. The nearest core (VM 28-271P) is 35 miles away and it recovered sandy/silty clay with ash layers. This and DSDP holes seem to be adequate for engineering.

There is adequate data for Site J1b available for PPSP to make an informed decision.

J3a - Site on possible obducted slice of crust. The tectonics of this site are indiscernable without migrated sections. **The 1988 survey should plan crossing lines, with migration.**

J1D - Site on presumed fossil spreading center. It is located on a structural high and may be vetoed by PPSP. A crossing MCS line is planned for 1988.

J2a - Yamato Rift. This site is adequately documented with existing data and does not appear to present any safety problems.

Sites Jlb, J2a and JS2 are approved from an SSP perspective, noting that there may be safety concerns at Jlb and that JS2 really needs high resolution seismic data to optimize its value.

Suyehiro reviewed the downhole seismic experiment planned for site J1b. The basic instrument will be built and tested this summer. The instrument could be hard-wired to shore even after being placed in the hole. Deployment may be tested on the Engineering Leg (124E).

4. SITE SURVEYS OF OTHER WPAC DRILLING PACKAGES

A. NE Australia (Jones)

The recent site survey has an excellent grid over all the proposed sites. There is good distribution of cores to resolve spudding in questions.

The following additional work will be needed to complete the site survey package:

1) Completion of processing, including migration on slope sites. Full sections need to be displayed. Do not cut off the bottoms of the sections!

2) Submission of cruise report and core descriptions to the ODP Data Bank.

3) Structure and isochron or isopach maps at appropriate intervals in order to properly choose sites and demonstrate lack of updip closure to PPSP.

The SSP strongly recommends that the NE Australia drilling package be presented on a preliminary basis by the site proponents to PPSP in order to get their advice on viable site alternatives and what documentation they will require for allaying safety concerns.

The SSP notes that the safety packages for Leg 101, which referred to a similar environment, was well received by PPSP and should be used as one possible model for preparing NE Australia safety package.

Site NEA-4 - The crossing lines appear to be out by about 500 m. A discussion of navigational accuracy should accompany each structure map.

Site NEA-10A - The target is the upper part of a Miocene rift in a relatively unstructured position. Dredges on the scarp of the platform indicate that the reef section is breeched. Structural maps will be needed to demonstrate that the position of breeching is structurally higher than and connected to the reef section at the proposed site.

Detailed notes of the SSP watchdog and site survey matrix are attached as Appendix N.

B. South China Margin (Mountain)

Mountain reviewed the science and the supporting data for the proposed drilling. The available data set appears to be excellent (see attached site survey matrices, Appendix O), but more work is needed in order to properly choose site locations, specifically including:

1) All lines near target sites need to be migrated (plans are in place to do this).

2) Structural maps need to be made at all proposed sites, specifically including at least the top of the pre-rift section, the top of the syn-rift section, and an isopach of the syn-rift section.

3) Careful velocity scans and depth estimates need to be done at all proposed sites in order to get accurate drilling time estimates for planning purposes. The current proposal seems unduly optimistic as to how much can be accomplished in one leg.

4) A detailed bathymetry map at a working scale is needed.

C. Lau Basin (Duennebier)

DARWIN will be surveying there with GLORIA in June with Larry Parson (IOS) as Chief Scientist. There is a critical need for a seismic profile on 18° 40' S between 176°-178° W and tied to *SONNE*'s survey grid.

ACTION: JONES contact PARSON to insure that required Lau Basin SCS line is obtained. BRENNER provide PARSON with a copy of *SONNE* cruise report.

Hawkins has a cruise planned on *WASHINGTON* in January, 1989 including SeaBeam, SCS (air and water guns), 3.5 kHz, and dredging.

ACTION: SSP will review *DARWIN* data at next meeting in order to give advice to Hawkins. KIDD coordinate sending *DARWIN* data to DUENNEBIER for review prior to meeting.

D. Vanuatu (Mauffret)

USGS data at Data Bank. French seismic data still being processed at USGS.

DEZ-1 Velocity analysis indicates velocities of 2 km/sec in cap rock at SP 703. Spudding in should not be a problem.

DEZ-2 The calculated velocities of 3.5 km/sec above the décollement indicate that the overriding plate is igneous. Soft sediment for spudding in still has not been demonstrated.

SSP requests further velocity analysis and a look at 3.5 kHz data at DEZ-2 and downslope where overriding plate is thinner. Both USGS and French data should be l ooked at.

ACTION: MAUFFRET write to Fisher at USGS (cc: Brenner, Mountain and Taylor) to request analysis of velocities and 3.5 kHz data over DEZ-2 to resolve questions regarding spudding in and depth to décollement surface.

DEZ-5 - Velocities in the cap rock are about 2.35 km/sec, indicating that no difficulty in spudding in should be expected.

E. Reference Sites (Taylor)

At the Bonin reference site (unnumbered) there appears to be adequate data (crossing MCS, magnetics, ESP'S, and 3.5 kHz).

In the Marianas there is still no precise site location chosen, so data adequacy is impossible to assess. LITHP has been asked by PCOM to define a site location.

ACTION: **MOUNTAIN to contact Detrick to get specific location of Marianas ref. site. BRENNER will send all site data to KIDD for review at next meeting.**

5. INITIAL REVIEW OF HIGH PRIORITY CEPAC SITES

A. East Pacific Rise.

Discussion premature until we have synthesis and the Working Group Report.

ACTION: **LEWIS contact Detrick and prepare a synopsis review of EPR and 504B for next meeting.**

B. Juan de Fuca.

No discussion as Peirce not prepared to give a report. Will review at next meeting.

C. Neogene Paleo-environment (H. Meyer)

1) Ontong Jave Plateau depth transect (#142E).

No specific sites have been chosen yet. Winterer will acquire high resolution SCS in the area with SeaBeam in ll/38.

The SSP feels that a critical objective of this site survey is to obtain good seismic correlations from the top of the plateau across the slope into the basin, if possible. Every effort should be made to obtain optimum seismic continuity across the slope region.

2) Equatorial Pacific (#221E)

There is no information on the available survey data to support the proposed sites.

The SSP requests that the site proponents for the Equatorial Pacific proposal document the seismic evidence backing up each of the proposed sites. The proposal cannot advance further without this documentation.

D. Mesozoic Paleoceanography (Duennebier)

A site survey of 13 guyots is scheduled by Duennebier in March-April, 1988. The survey plan is to run a SeaMarc ring around each guyot, looking for dredge sites. Then they will shoot two crossing SCS lines, and then they will dredge both the igneous basment and the cap rock. Further review scheduled at the next meeting.

E. Shatsky Rise (Suyehiro)

The proposal is based on DSDP drilling and old airgun seismic records. The site survey matrix of existing data is attached as Appendix P.

The SSP is very concerned that drilling on the Shatsky Rise may proceed only on the old data currently available. Given the sedimentary complexity of the Shatsky Rise and the problems expected with drilling chert, more data appears to be needed to adequately support drilling. In particular, high resolution SCS and side scan sonar data are needed.

ACTION: **BRENNER provide SUYEHIRO with available data on Shatsky Rise for review at next meeting. DUENNEBIER will talk to Schlanger and LEWIS will talk to Sliter for their views before the next meeting.**

F. Chile Triple Junction (Lewis)

The site survey areas include one area north of the ridge/trench collision zone, the collision zone itself, and an area south of the collision zone where collision appears to have happened about 4 m.y. ago. The north and south grids are less dense than the main survey area.

The survey included SeaBeam with 80 cu. in. watergun, MCS at 10 km grid with 4000 cu. in. airgun array, 240-channel, 96-fold data and 12 sec recording.

The data set presently abvailable looks superb and should allow well documented sites to be proposed. No further review by SSP is appropriate until a specific drilling proposal has been made.

G. Hawaii Moat (Mauffret)

Further survey planned as discussed above. The major problem seems to be establishing that adequate biostratigraphic age control of 100,000-200,000 years is achievable. The available core data is being reworked to look at this problem.

H. Marquesas (Mauffret)

The available data include SeaBeam, SCS, gravity, magnetics, dredging and coring. There is a proposal by McNutt, Detrick, and Mutter under consideration by NSF to obtain MCS and SeaBeam and conduct a two ship seismic experiment with Franchteau in 1989.

The SSP agrees with the site proponents that more data is necessary to make this a viable drilling proposal. There is little point in further review until more data are available.

I. Old Pacific proposals

No review prepared.

ACTION: **BRENNER send data package for Old Pacific proposals to KIDD for review at next meeting. KIDD contact Shipley and Lancelot regarding new data to include in review.**

6. OTHER BUSINESS

A. JOI/USSAC Workshop on Sea Level Changes.

The Workshop is scheduled for October 24-26 in El Paso with a field trip to the Guadeloupe Mts. led by Peter Vail scheduled for the weekend previous, October 22-23. Contact Mountain for further details, as he is one of the organizers.

B. Industry representation on SSP.

SSP requests that PCOM appoint an industry person to SSP. Peirce will be rotating off SSP at the end of 1988 to be replaced by Keith Louden of Dalhousie.

C. Alain Mauffret is rotating off SSP after this meeting.

A replacement is not yet named. The Chairman thanked Mauffret for his effective contributions to the work of the SSP and his long term membership.

ACTION: MAUFFRET/MOUNTAIN brief new French representative on review responsibilities for next meeting.

D. Early reviews by PPSP

The SSP recommends that serious consideration be given to holding a special meeting of PPSP for early review of NE Australia, Japan Sea and South China margin.

7. CHANGE OF CHAIRMANSHIP

Greg Mountain officially assumed the position of SSP Chairman.

Mountain acknowledged the excellent leadership that Peirce had provided the Panel, and thanked him for his help in advising Mountain of his new responsibilities.

Mountain reiterated previous expression of thanks to and acknowledgement of contributions from Alain Mauffret, and stated Mauffret's continuation as an alternate member would be a welcomed service to the Panel..

8. LIAISONS

A. S. Lewis to CEPAC in Menlo Park, 23-25 March.

B. H. Meyer to WPAC in Hannover, 11-13 April.

ACTION: MOUNTAIN arrange with Rea, Taylor, and Pisias for CEPAC and WPAC liaisons. Also appoint liaison for summer meeting of PPSP. Also contact Davis/Detrick regarding need for liaison to EPR Working Group.

9. NEXT MEETING

The next meeting is tentatively scheduled for Swansea, Wales, on 27-29 September with Rob Kidd as host.

ACTION: MOUNTAIN request formal approval for meeting at appropriate time, no later than July 1.

10. CLOSING

Mountain thanked Brenner for hosting the meeting in Palisades.

Appendices not yet available
(Ships schedules, ..)

SITE SURVEY PANEL

Palisades, New York
March 15-17, 1988

ACTION ITEMS

ACTION: DUENNEBIER to read Cooper's letter and provide A. Meyer with comments. (completed at meeting)

ACTION: Lewis to get copy of *FARNELLA* cruise reports and track charts pertaining to Hawaii moat for Data Bank.

ACTION: PEIRCE/BRENNER call Gradstein, Hiertzler, and WHOI to insure that a plan of action is agreed upon to resolve the discrepency between the plotted magnetic anomalies across Argo Abyssal Plain and their published interpretation.

ACTION: JONES to get Masson to send copies of *DARWIN* data and track chart over BNDA 1, 2 and 3 to H. Meyer, C. Brenner, A. Meyer and B. Taylor ASAP. BRENNER to send data presently in Data Bank to H. Meyer in time for WPAC meeting.

ACTION: H. MEYER will review *DARWIN* data with WPAC at their April meeting. He will complete a site survey matrix and send via Telemail final recommendations regarding BNDA-1 to G. Mountain for review and transmission to PCOM before their meeting in mid-April.

ACTION: H. MEYER will work with BGR staff to plot magnetics plotted at seismic scales for site SCS-9 before the WPAC meeting. At that meeting he will complete a new site survey matrix for sites SCS-9 and SCS-5B to be hand carried by Pisias to PCOM, and also forward them by computer mail to Mountain. MEYER will also expedite sending SO-49 magnetics to ODP Data Bank.

ACTION: DUNNEBIER will be crossing Marianas Trench axis at potential deep-water engineering test site twice next month on *MOANA WAVE*. He will send profiles to A. Meyer with copies to the Data Bank.

ACTION: SUYEHIRO will look for Japanese data on Caroline Ridge for Leg 124E and feed back to A. Meyer

ACTION: DUENNEBIER prepare site survey matrix for Leg 125. Included as Appendix L.

ACTION: SUYEHIRO contact Nishi Mura of the GSJ and forward heat flow data (paper/preprint?) by courier to M. Langseth for review. LANGSETH and MOUNTAIN make recommendations prior to WPAC meeting in April. There may be some chance for a detailed heat flow profile by the GSJ.

ACTION: DUENNEBIER to complete matrix for Leg 126 sites for inclusion in minutes as Appendex M. SUYEHIRO to ask GSJ for a set of selected core descriptions near planned sites for submission to Data Bank to provide background info for TAMU engineers. Any failed coring attempts because of hard bottom are especially important to know about.

ACTION: SUYEHIRO to coordinate submission of SSP profiles (ESP's shot with one ship held stationery in strong current) to ODP Data Bank.

ACTION: JONES contact PARSON to insure that required Lau Basin SCS line is obtained. BRENNER provide PARSON with a copy of *SONNE* cruise report.

ACTION: SSP will review *DARWIN* data at next meeting in order to give advice to Hawkins. KIDD coordinate sending *DARWIN* data to DUENNEBIER for review prior to meeting.

ACTION: MAUFFRET write to Fisher at USGS (cc: Brenner, Mountain and Taylor) to request analysis of velocities and 3.5 kHz data over DEZ-2 to resolve questions regarding spudding in and depth to décollement surface.

ACTION: MOUNTAIN to contact Detrick to get specific location of Marianas ref. site. BRENNER will send all site data to KIDD for review at next meeting.

ACTION: LEWIS contact Detrick and prepare a synopsis review of EPR and 504B for next meeting.

ACTION: BRENNER provide SUYEHIRO with available data on Shatsky Rise for review at next meeting. DUENNEBIER will talk to Schlanger and LEWIS will talk to Sliter for their views before the next meeting.

ACTION: BRENNER send data package for Old Pacific proposals to KIDD for review at next meeting. KIDD contact Shipley and Lancelot regarding new data to include in review.

ACTION: MAUFFRET/MOUNTAIN brief new French representative on review responsibilities for next meeting.

ACTION: MOUNTAIN arrange with Rea, Taylor, and Pisias for CEPAC and WPAC liaisons. Also appoint liaison for summer meeting of PPSP. Also contact Davis/Detrick regarding need for liaison to EPR Working Group.

ACTION: MOUNTAIN request formal approval for meeting at appropriate time, no later than July 1.

JOI Joint Oceanographic Institutions
INCORPORATED

Suite 800
1755 Massachusetts Ave., N.W.
Washington, D.C. 20036 USA

Telephone (202) 232-3900
Telemail: JOI.INC
Telex 257828

March 9, 1988

88-108

RECEIVED MAR 1 ? 1988

Dr. Nicklas G. Pisias
College of Oceanography
Oregon State University
Corvallis, OR 97331

Dear Nick,

The enclosed letter invites me to discuss "the JOI/ODP prospective" on a proposed program of Scientific Drilling in the Arctic Ocean at a meeting in Ottawa this June.

In regard to the ODP half of this prospective, I think it would be useful to get PCOM's advice and comment. Would you please add this item to the agenda for the April PCOM meeting.

Thank you.

Sincerely,

Tom

Thomas E. Pyle
Director
Ocean Drilling Programs

cc: D. J. Baker
E. S. Kappel

Enclosure

Energy, Mines and Resources Canada — Energie, Mines et Ressources Canada

Earth Sciences — Sciences de la Terre

308

29 February 1988

Dr. T. Pyle
JOI Inc.
1755 Massachusetts Ave., N.W.
Suite 800
Washington, D.C. 20036

Dear Dr. Pyle:

SUBJECT: SCIENTIFIC DRILLING IN THE ARCTIC OCEAN: PLANNING FOR THE 1990'S

Locked beneath a nearly permanent cover of ice, the deep-sea basins of the Arctic Ocean hold the potential key to a number of fundamental geologic, tectonic, and climatological problems. Recognizing the critical need for scientific deep-ocean drilling in the Arctic, an international effort has begun, aimed at organizing a major drilling expedition to the deep Arctic. While deep drilling will be the primary goal of this expedition, the platform will also serve as the focus of numerous other polar experiments.

In December 1986, the IUGG-ICL, the IUGS-CMG and the Geological Survey of Canada (GSC), sponsored a workshop, attended by Arctic drilling experts, and aimed at assessing the technical feasibility of Arctic deep drilling. The workshop concluded the such drilling would be complicated and costly, but FEASIBLE with existing industry and ODP technology. A key element of an Arctic drilling effort is the need for a Class 8, ice rated, research platform. The Government of Canada has committed itself to the construction of such a platform, and, as the plans for this vessel are being finalized, it is important that representatives of the scientific community gather to:

1. review the status of the international effort
2. pinpoint specific objectives and targets
3. evaluate the capabilities of the proposed Class 8 platform and other facilities
4. organize future efforts

../2

Atlantic Geoscience Centre
Geological Survey of Canada
Bedford Institute of Oceanography
Box 1006, Dartmouth, Nova Scotia
B2Y 4A2
Telex 019-31552

Centre géoscientifique de l'Atlantique
Commission géologique du Canada
Institut océanographique de Bedford
C.P. 1006, Dartmouth, Nouvelle-Ecosse
B2Y 4A2
Telex 019-31552

Canada

Dr. T. Pyle
29 February 1988
Page 2

The IUGG-ICL, IUGS-CMG, and the GSC have therefore organized a two day meeting to be held at the Geological Survey of Canda in Ottawa on June 23 and 24, 1988 in order to address these issues. We enclose a tentative agenda for this meeting and look forward to your participation.

In order to facilitate the discussion of scientific objectives and specific targets, we ask that you fill our copies of the enclosed site summary form for any drill site that you know (or perceive) there to be interest amongst the scientists you represent. While some sites can be defined in detail, many others can only be discussed "generally" representative of a particular scientific problem. Any information you can provide will help us to formulate a more specific drilling program and to better define the capabilities necessary to achieve our goals. We request that these forms be returned to:

Larry Mayer
Department of Oceanography
Dalhousie University
Halifax, NS B3H 4J1

by 10 May 1988 so that we can have a compilation ready in time for our meeting.

Any suggestions or proposed workshop agenda would be welcomed. Would you also please indicate as soon as possible whether you will be able to attend or not.

Sincerely yours,

K.S. Manchester

SCIENTIFIC DRILLING IN THE ARCTIC OCEAN

PLANNING FOR THE 1990'S

I. Welcome and Introduction
L. Johnson, J. Thiede, C. Barnes

II. Status of International Effort
A. Germany - J. Thiede
B. Norway - Y. Kristoffersen
C. Sweden - J. Backman
D. U.K. - A. Mayer
E. U.S.A. - L. Johnson
F. U.S.S.R. - A.P. Lisitsyn
G. Canada - M.J. Keen

III. The JOI/ODP Perspective:
T. Pyle

IV. Scientific Objectives and Specific Targets
L. Mayer

V. Review of Alternatives for Drilling Platforms and Support Vessels:
S. Blasco
M. Peterson

VI. The POLAR 8
A. Status
B. Planned capabilities
W. McCloy

VII. Discussion:
A. Discrepancies between existing (or planned) capabilities and scientific objectives
B. How can discrepencies be resolved

VIII. Other Issues:
A. Site surveys
B. Political concerns

IX. Where do we go from here:
A. Centennial of Hansen's Drift
B. Other alternatives

PROPOSED LIST OF ATTENDEES

Dr. L. Johnson
Geophysical Sciences
Office of Naval Research
Arlington, VA

Dr. A.P. Lisitsyn
Chief of Oceanography
Institute of Oceanography
USSR Academy of Sciences
Moscow

Dr. M. Peterson
Chief Scientist
NOAA, Dept. of Commerce
Washington, D.C.

Dr. A. Green
Exxon Production Research
Houston, Texas

Dr. R. Corell
Associate Director Earth Science
National Science Foundation
Washington, D.C.

Dr. G. Brass
Rosentiel School of Marine & Atmospheric Science
University of Miami, Florida

Dr. A. Mayer
N.E.R.C.
London

Dr. P. LaPointe
Director, Polar Continental Shelf Project
Geological Survey of Canada
Ottawa, Ontario

Mr. K. Hewitt
Canadian Marine Drilling
Dome Petroleum
Calgary, Alberta

Dr. Y. Kristoffersen
Seismological Observatory
University of Bergen
Bergen, Norway

Dr. J. Thiede
Geogich - Palaontologische Institute
Christian - Albrechts Universitat
F.R. Germany

Dr. N. Ostenso
Director Sea Grant
NOAA, Dept. of Commerce
Rockville, Md.

Dr. T. Pyle
JOI Inc.
Washington, D.C.

Dr. A. Grantz
United States Geological Survey
Menlo Park, California

Dr. J. Backman
Dept. of Geology
University of Stockholm
Sweden

Dr. C. Barnes
Director General
Geological Survey of Canada
Ottawa, Ontario

Dr. J. Malpas
Dept. of Earth Sciences
Memorial University
St. John's, Newfoundland

Mr. W. McCloy
Project Director
Polar Icebreaker Project
Canadian Coast Guard
Ottawa, Ontario

Mr. J.F. Searle
Senior Naval Architect
Polar Icebreaker Project
Canadian Coast Guard

Mr. S. Blasco
Atlantic Geoscience Centre
Geological Survey of Canada
Dartmouth, Nova Scotia

Dr. L. Law
Director, Pacific Geoscience Centre
Geological Survey of Canada
Sidney, British Columbia

Dr. G. Hempel
Director, Alferd Wegener Polar Inst.
Bremerhavn, West Germany

Dr. P. Mudie
Atlantic Geoscience Centre
Geological Survey of Canada
Dartmouth, Nova Scotia

Mr. K.S. Manchester
Atlantic Geoscience Centre
Geological Survey of Canada
Dartmouth, Nova Scotia

T. Vorren
Institute of Geology/Biology
University of Tromso
Tromso, Norway

Capt. D. Johns
Northern Operations Manager
Canadian Coast Guard
Ottawa, Ontario

Dr. D. Ross
Assistant Direactor
Atlantic Geoscience Centre
Geological Survey of Canada
Dartmouth, Nova Scotia

Dr. L. Mayer
Dept. of Oceanography
Dalhousie University
Halifax, Nova Scotia

Dr. M.J. Keen
Director, Altantic Geoscience Centr
Geological Survey of Canada
Dartmouth, Nova Scotia

Dr. R. Jackson
Atlantic Geoscience Centre
Geological Survey of Canada
Dartmouth, Nova Scotia

A. Karlquist
Swedish Polar Research Society
Secretariat
Stockholm, Sweden

EXECUTIVE SUMMARY

Central and Eastern Pacific Panel Meeting
Menlo Park, California
23-25 March 1988

The Central and Eastern Pacific Regional Panel met 23-25 March, 1988 at the U.S. Geological Survey in Menlo Park, California. New members of CEPAC, Beiersdorf, Floyd and Kroenke replaced von Stackelberg, Jenkyns, and Scholl, respectively.

CEPAC heard liaison reports from PCOM (Coulbourn), LITHP (Davis), TECP (Riddihough), SOHP (Meyers), JOIDES Office (Stambaugh) and JOI (Kappel). The thematic panels were unanimous in their dismay at PCOM for placing artificial limitations on CEPAC science. Each established a minimum core program for their CEPAC requirements. The SSP reviewed the data base for many of the highly ranked CEPAC programs and found it to be in quite good shape.

Most of the meeting was spent in writing a prospectus for each priority program. These programs are:

LITHP Priority Objectives:

EPR bare-rock, fast spreading ridge	Francheteau
Sedimented ridge axes	Davis
504B penetration of lower crust	Flower
Young hotspot volcanism	Batiza

TECP Priority Objectives:

Ridge-trench interactions	Lewis
Lithospheric flexure	Kroenke
Cascadia accretion and dewatering	Riddihough
Oldest crust/geochemical reference	Floyd
Pre-70 Ma plate motions	Mixed with other programs as part of multiobjective sites

SOHP Priority Objectives:

West Pacific Equatorial Depth Transect	Okada
E.Pacific Equatorial Latitudinal Transect	Beiersdorf
North Pacific Transects	Schrader

Atolls and Guyots	Schlanger
Shatsky Rise depth transect	Sliter
Bering Sea paleoenvironment/paleolocation	Meyers (will be Sancetta)

In other actions, CEPAC has asked Loren Kroenke to be our liaison to TECP, replacing D.Scholl. CEPAC was impressed by the work of the LITHP East Pacific Rise Working Group and is delighted that such a working group will review the proposed programs for the sedimented ridge crests in the Northeast Pacific. We urge TECP to establish a similar group to investigate accretionary prisms and how drilling on the Cascadia Margin would fit into a global scheme.

Future meetings of CEPAC are scheduled for:

18-19 July 1988	Corvallis, OR
17-19 October 1988	Ann Arbor, MI

CENTRAL AND EASTERN PACIFIC REGIONAL PANEL MEETING

USGS, Menlo Park, California
23-25 March 1988

ATTENDANCE

Members:
D.Rea, Chairman, H.Beiersdorf, E.Davis, M.Flower, P.Floyd, J.Francheteau, L.Kroenke, H.Okada, S.Schlanger, H.Schrader, W.Sliter (Absent: C.Sancetta)

Guests and Liaisons:
R.Batiza (LITHP), W.Coulbourne (PCOM), S.Lewis (SSP), P.Meyers (SOHP) R.Riddihough (TECP), E.Kappel (JOI), S.Stambaugh (JOIDES Office)

INTRODUCTIONS AND REVIEW OF AGENDA

Chairman D.Rea introduced new members, H.Beiersdorf, P.Floyd and L.Kroenke, and presented the agenda for the meeting. CEPAC thanked old members (in absentia) H.Jenkyns, D.Scholl and U.von Stackelberg, for their long service to CEPAC and ODP. W.Sliter, hosting member, reviewed meeting logistics and events.

LIAISON REPORTS

PCOM:

W.Coulbourne reported on the December PCOM meeting in Sunriver. He reviewed the status of the Western Pacific program planning, noting the potential clearance problems with Leg 124 (Banda-Sula-SCS). PCOM dedicated a short leg (124E) to engineering tests to help ensure that high thematic objectives in the Western Pacific can be achieved and to improve logistics. WPAC's prospectus through Leg 129 was accepted by PCOM, with the remainder of the 22-month WPAC program awaiting definition at the April meeting.

Coulbourne reviewed PCOM's directions for CEPAC planning. Discussions at Sunriver included how to achieve thematic objectives within the framework of existing proposals. Intense interest in regional directives for the drillship was expressed (timeframe for returning to the Atlantic, e.g.). PCOM took highly ranked programs from each of the three regional panels, assigned watchdogs and devised a tentative program (Attachment A).

Considering that each thematic panel had a minimum of four priority programs, Rea recalled the CEPAC tradition of proposing multiple-objective holes to achieve the best drilling prospectus for the area. Coulbourne added that PCOM's list of proposals relating the priority themes should be revised if CEPAC feels they do not adequately address the stated thematic objectives.

CEPAC briefly discussed the recent unfavorable PPSP review of the Exmouth Plateau drilling. LITHP and TECP liaisons reported that their panels were not in favor of inserting additional drilling attempts at SWIR (Hole 735B) into the remaining Indian Ocean drilling schedule at this time.

LITHP:

E.Davis reported for LITHP. Davis said that attendance of a TAMU engineer at the meeting greatly aided the panel in its discussions of engineering needs for LITHP programs; future meetings at College Station should also improve engineering liaison.

CEPAC encourages engineering liaison between TAMU and thematic panels whenever possible.

LITHP has outlined the following core program for Central Pacific drilling in response to the PCOM tentative schedule:

LITHP Core Program for CEPAC Area

Program	Ideal Drilling Time Required
1. Return to 504B	1.5 legs, including .5 as engineering time to fish & condition hole from previous drilling
2. EPR bare rock	Minimum of 2 legs
3. Sedimented ridge (NE Pacific)	2 leg minimum
4. Young hotspots (Loihi or Marquesas)	1 leg minimum

These programs represent highest priority programs, with an estimated 6.5 legs of drilling time required.

Davis also reported on the deliberations of the EPR Working Group; CEPAC was delighted to see a coherent set of objectives for the proposed effort at the East Pacific Rise.

CEPAC discussed the engineering requirements for high-temperature drilling at EPR and the possibility that slim-line logging tools (rented from Schlumberger) may be required with the mining drilling system.

CEPAC encouraged the continuation of some form of the LITHP EPR Working Group to bring the same coherence to proposed drilling plans on sedimented ridge crests in the Northeast Pacific.

TECP:

R.Riddihough reported on the March meeting of the Tectonics Panel. TECP was concerned that PCOM only selected two tectonics programs for the initial tentative CEPAC drilling program, and strongly reaffirmed their commitment to five programs for that area. These programs are:

1. M-series dating
2. Pre-70 Ma plate motion
3. Flexure of the lithosphere
4. Ridge-trench interactions
5. Deformation and fluid circulation in accretionary prisms

CEPAC noted that programs 1,3,4 and 5 could be readily meshed with existing proposals but that program 2 could best be achieved by adding basement objectives to multi-purpose sites. CEPAC also noted that the Hawaii flexure program still hinges on dating and that the Chile triple junction program depends on finding good drilling targets. Promised reports by D.Kent on the Hawaii dating and by S.Cande on the results of his recent cruise should resolve these issues.

Loren Kroenke (U.Hawaii) volunteered to replace D.Scholl as CEPAC liaison to TECP.

SOHP:

P.Meyers reported on the recent meeting of the Sediments and Ocean History Panel. SOHP decried the PCOM limitation on CEPAC drilling and reaffirmed its five highest priority programs for the Pacific:

A. Neogene Paleoceanography

1. Western equatorial Pacific depth transect
2. Eastern equatorial Pacific latitudinal transect
3. North Pacific transect

B. Mesozoic and Paleogene paleoceanography and sea level

4. Atolls and guyots
5. Pacific anoxic events

Further, SOHP strongly encouraged efforts in high-latitude paleoceanography in the Bering Sea, and dewatering of accretionary prisms.

SSP:

S.Lewis reported on the meeting of the Site Survey Panel. SSP's first hard look at the data sets supporting the highly-ranked drilling themes showed most objectives to be quite well-documented.

More SCS lines would enhance efforts on Shatsky Rise, Eastern Equatorial Pacific, and North Pacific Paleoceanography.

Other Reports:

S.Stambaugh discussed some of the activities of the JOIDES Office, including PCOM plans to promote engineering development and to restructure the advisory panels. E.Kappel presented a brief overview of the JOI budgetary outlook over the FY88-92 timespan.

FUTURE MEETINGS

18-19 July	Corvallis, OR
17-19 October	Ann Arbor, MI

PREPARATION OF CEPAC PROSPECTI

The main task of the March, 1988 CEPAC meeting was to prepare a more complete prospectus for Pacific drilling. At the Paris meeting in October of 1987, CEPAC prepared brief, one-page outlines of 22 programs for Pacific drilling. At this meeting, we prepared an expanded prospectus for each drilling program that was highly ranked by the thematic panels. These programs included those adopted by PCOM in their tentative preliminary outline.

The drilling programs and their CEPAC watchdogs are:

LITHP Priority Objectives:

EPR bare-rock, fast spreading ridge	Francheteau
Sedimented ridge axes	Davis
504B penetration of lower crust	Flower
Young hotspot volcanism	Batiza

TECP Priority Objectives:

Ridge-trench interactions	Lewis
Lithospheric flexure	Kroenke
Cascadia accretion and dewatering	Riddihough
Oldest crust/geochemical reference	Floyd
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North Pacific Transects	Schrader
Atolls and Guyots	Schlanger
Shatsky Rise depth transect	Sliter
Bering Sea paleoenvironment/paleolocation	Meyers (will be Sancetta)

Paragraph summaries of each of these topics are attached to these minutes. The full set of documents will follow with all deliberate speed.

CONCLUDING DISCUSSIONS

CEPAC found the results of the EPR Working Group (of LITHP) to be very helpful in determining a strong program for EPR drilling. In that vein, we encourage the continuation of some form of that group as the Sedimented Ridge Working Group. In addition, we encourage TECP to establish a working group to consider all aspects of drilling accretionary prisms, with, of course, some emphasis to be placed on the Cascadia margin programs under consideration by CEPAC.

Tentative Central and Eastern Pacific Program

Program	Relevant Proposals	PCOM Watchdog(s)
LITHP		
* Structure of lower oceanic crust (about 1.5 leg)	286/E Deepening of 504B	J.Malpas
* Magmatic and hydrothermal processes/ sed-free ridgecrests (2 legs)	76/E East Pacific Rise at 13oN	T.Francis
* Magmatic and hydrothermal processes/ sedimented ridgecrest (1 leg)	232/E Juan de Fuca 224/E and 284/E Escanaba Trough	M.Langseth M.Kastner
SOHP		
* Neogene paleoenvironment (1 leg)	221/E Eq.Pacific 142/E OJP transect	S.Gartner
* Mesozoic paleoceanography/ atolls and guyots (1+ leg)	202/E Drowned Marshalls Guyots	B.Tucholke
* Anoxic events (1 leg)	253/E Shatsky Rise	G.Brass
TECP		
* Ridge-trench processes (1 leg)	8/E Chile 3-junction	O.Eldholm
* Flexure in the lithosphere (1 leg)	3/E Hawaii flexural moat (dating?)	Coulbourn
ALL PANELS		
* M-series dating/ reference holes	285/E Jr quiet zzzone 287/E M-series drilling	A.Taira J.P.Cadet

ATTACHMENT A

ABSTRACT OF THE CEPAC PROSPECTUS

Fast-spreading Ridge Crests, the East Pacific Rise:

Drilling at the crest of the East Pacific Rise, where sea-floor spreading is rapid and hydrothermal activity is very active, is proposed to approach several questions of crustal generation and hydrothermal processes. These questions include the nature of the axial magma chamber as defined by its strong seismic reflector, alteration of crust by hydrothermal processes, composition and relative emplacement chronology of young oceanic crust, determination of the "ground truth" for intra-crustal seismic reflectors, and allowing placement of in-situ, long-term monitoring devices. Details of the EPR program are being prepared by the EPR working group of LITHP.

This program is among the highest priority objectives of LITHP and COSOD-II, WG-3. The current CEPAC watchdog is J. Francheteau.

Young Hotspot Volcanism:

The purpose of this drilling program is to establish the nature of the early eruptive products of hotspot volcanos. This information is needed to test a variety of hypotheses regarding the mantle sources of hot spot volcanos as well as fundamental aspects of their origin and evolution. Currently these questions are best approached at Loihi whose youth and modest size make it an inviting target. Drilling here will help elucidate thermal and chemical interaction between the asthenosphere and lithosphere during incipient volcanism, magma ascent mechanics and eruption dynamics, and, a bonus at Loihi, a shallow hydrothermal system where boiling occurs.

This program is among the high priority objectives of LITHP and COSOD-II, WG-2. The current CEPAC watchdog is R. Batiza.

Lower Oceanic Crust, Penetration of Layer 3:

The lithologic and petrologic interpretation of oceanic layer 3 is based almost entirely on indirect evidence. The single best opportunity to penetrate through the sheeted dike layer and sample the underlying material is at site 504B. VSP data suggest that the transition from dikes to gabbros occurs a few hundred meters below the present TD. This location is remarkably well documented, but will require some site preparation to deviate around the junk in the hole and repair some casing.

Penetration of layer 3 has always been the top priority of LITHP and COSOD-II, WG-2. The current CEPAC watchdog for this program is M. Flower.

M-series Dating - Geochemical Reference Holes:

It is possible to combine the objectives of CEPAC drilling into one package with the goal of determining the maximum amount of information about a very old portion of the Pacific Ocean. The goal of this program is to determine the stratigraphic and paleoceanographic record of the upper Jurassic and early Cretaceous global ocean, the chronology and importance of

Cretaceous off-axis volcanism, the nature and composition of the oldest basaltic basement, and the age and paleolatitude of the crust. Significant crustal penetration, along with the supra-crustal sediments, will allow the formulation of the input portions of subduction zone geochemical mass balances.

This program is a high priority of all thematic panels and of COSOD-II, WG-1 and -5. The current CEPAC watchdog is P. Floyd.

Ridge-trench Interactions:

The interaction of spreading centers and subduction zones has determined the character of the edges of continents throughout the history of the Pacific Basin. This program will determine the important effects of this interaction at a site of ongoing collision, the Chile Ridge-Trench-Trench triple junction. Drilling will investigate: the nature and extent of rapid vertical motions near the triple junction, the elevated thermal gradients and associated metamorphism, anomalous near-trench volcanism, and tectonic erosion of the trench slope. Recent surveys assure high-quality MCS and seabeam data for choosing the final sites.

This program has always been among the highest priorities of TECP and is of interest to COSOD-II, WG-4. The current CEPAC watchdog is S. Lewis.

Sediment-covered Ridge Crests:

Drilling on the axis of spreading centers where sediments cover and seal the hydrothermal circulation cells will allow investigation of: the nature of high-temperature fluids in zero-age crust and the overlying sediment column, how sediment cover influences fluid circulation and chemistry, thermally induced diagenesis of organic and inorganic sedimentary materials, and questions of metallogenesis and sulfide emplacement. The hot, altered basaltic crust beneath the sediments should be much more readily drillable than basalts at bare-rock locations elsewhere. Open boreholes are natural sites for long-term monitoring devices. Several good regions for this drilling program exist in the Gorda-Juan de Fuca region, final proposals may await efforts by a LITHP working group on sediment-covered ridges. The data base for this program is exceptional.

This program has always been among the highest priorities of LITHP and is an important goal of COCOD-II, WG-3. The CEPAC watchdog for drilling at sediment-covered ridge crests is E. Davis.

Accretionary Processes at the Cascadia Margin:

Several processes important to our understanding of accretionary margins can be examined along the Cascadia convergent plate boundary. Drilling offshore from Vancouver Island and from Oregon should reveal the physical and geochemical aspects of prism deformation and of materials transported landward below the main decollement. The transport paths of fluids as they escape from actively dewatering subduction complexes can be investigated. It is possible to tie some drillsites to deep continental reflection profiles, extending them seaward across the entire convergent plate boundary. Ensuing monitoring of the boreholes will permit long-term study of this potentially high-risk seismic zone.

This program is among the high priorities of TECP and COSOD-II, WG-3 and -4, and the dewatering aspects have been endorsed by SOHP. The current CEPAC watchdog is R. Riddihough.

Western Equatorial Pacific Depth Transect:

This program will permit detailed analyses to determine the paleoceanography of past western Pacific water masses and their influence on the preservation of calcareous sediments. Various questions to be pursued by this program include the dating and oceanic nature of seismic reflectors, variability of vertical gradients within past water masses, the response of the Pacific water masses to the changing Cenozoic environment, especially the changing configuration of oceanic gateways and the build-up of ice in polar regions. This program is sited on the Ontong-Java Plateau which has migrated from higher southern latitudes to its present site, so older sediments will provide a history of southern hemisphere paleoenvironment. A hole drilled into the basement will reveal the age and nature of that material, not yet penetrated. This program will complete a series of equatorial depth transects, one in each ocean.

This program is a high priority of SOHP and of COSOD-II, WG-1; basement objectives are included in the LITHP concern for the nature of oceanic plateaus and the TECP priority of determining the pre 70-Ma plate motions. Depth transects are a high priority of COSOD-II, WG-1. The current CEPAC watchdog is H. Okada.

Eastern Equatorial Pacific Latitudinal Transect:

This program will involve a detailed paleoceanographic study of the late Paleogene and Neogene equatorial circulation patterns in the Eastern Pacific. Two transects, with sites at different depths as well as different latitudes, will resolve questions of: evolution of equatorial circulation through the middle and late Cenozoic, whether paleoclimatic changes are hemispherically symmetrical or asymmetrical, the nature of equatorial circulation when trans-Panamanian oceanographic interaction was unhindered, was becoming restricted, and was closed off, and the nature of orbital modulation of climate during different stages of Neogene polar ice volume increase. Aspects of sea-surface productivity, water-mass variability, and deep water dissolution will be important components of this program as is the ultimate comparison of this effort to similar efforts in other oceans.

This program is a high priority of SOHP and of COSOD-II, WG-1 with their emphasis on transects. The current CEPAC watchdog for this program is H. Beiersdorf.

North Pacific Paleoceanographic Transects:

This drilling program will generate high-resolution sedimentary records of past surface and bottom water processes in the high latitudes of the North Pacific and determine how those processes relate to the prevailing climatic and tectonic regimes. Specific questions to be approached include: how the North Pacific interacts with global circulation patterns, when did PDW or Common Water first enter the region, when did episodes of formation of North Pacific Deep Water occur, what is the Neogene record of surface circulation and how does it change with polar cooling, what are the details of the Miocene calcareous to siliceous shift in biological productivity and the ancillary increasing provinciality of life forms, and finally the use of the terrigenous component to link oceanic records to those eolian, hemipelagic and ice-rafting records of continental climate. Many North Pacific sites can be located to reveal aspects of pre-70 Ma plate configurations.

This program is a high priority of SOHP and of COSOD-II, WG-1 and -5; the paleoplate aspect is a high priority of TECP. The CEPAC watchdog for this program is H. Schrader.

Flexure of the Lithosphere:

This program will investigate the rheology of oceanic lithosphere by determining its flexural response to the application of a known load. Volcanic island chains provide huge loads that cause adjacent depressions (moats) and peripheral rises (arches). Further, lithospheric reheating and possibly thinning occurs. This program will resolve the details of the loading history and the flexural response to it in a region that is geophysically very well constrained.

This program has always been among the highest priorities of TECP and of COSOD-II, WG-4. The current CEPAC watchdog is L. Kroenke.

Vertical Motions of Carbonate Banks and Sea Level History:

The stratigraphy, age, and diagenetic history of atolls and guyots and their archipelagic aprons when combined with information on the depth, age and paleolatitude of the underlying volcanic edifice will allow us to analyze the Paleogene and Cretaceous paleoceanography of the southwestern Pacific, the history of seamount subsidence and of changes in sea level over a wide region. We will approach questions of why atolls drown and establish independent sea level determinations away from the ambiguities of passive margin seismic stratigraphy.

This program is a high priority of SOHP, and COSOD-II, WG-1. The nature of the volcanic edifices is of interest to LITHP and the paleolocation data are among the priorities of TECP. The CEPAC watchdog for this program is S. Schlanger.

Anoxic Events in the Mesozoic Global Ocean:

The intent of this program is to define the time-stratigraphic distribution of Cretaceous and Jurassic organic-carbon rich strata in the low latitudes of the very large, pelagic Pacific Ocean. Drilling a depth transect on Shatsky Rise will allow determination of vertical water-mass relationships of these black layers, their dating will permit determination of their synchroneity (or non-synchroneity) with better known occurrences in the marginal seas of the proto-Atlantic. The composition, age and paleolatitude of the basement material will be determined by drilling into basement at at least one of these sites.

This program is of high priority to SOHP and to COSOD-II, WG-1; the nature of plateau basement is of interest to LITHP, and the age and paleolatitude information is important to TECP. The CEPAC watchdog for this program is W. Sliter.

Bering Sea Paleoenvironment:

High latitude paleoceanography is a primary goal of this program. The Mesozoic age of the floor of the Bering Sea provides an opportunity to sample the highest-latitude paleolocations in the entire North Pacific, to understand the nature of the Cretaceous warm interval in the northern Hemisphere, the areal extent of anoxic conditions, and the evolution of sub polar climates. Additionally there is an opportunity to achieve a high-resolution record of the Neogene paleoclimatology of the Bering Sea. Those records will allow resolution of the details of high-latitude evolution of sedimentation patterns and of the organisms contributing to the sediments. Hemipelagic and ice-rafted materials provide a direct link to continental climates of northwestern North America. The age and paleolatitude information of the Sounder Ridge site will allow differentiation between the two hypotheses for the evolution of north Pacific plate configurations and the origin of the Bering Sea proper.

This program is a priority of SOHP, and the pre-70 Ma plate motion aspects are among the highest priorities of TECP. Bering sea drilling was among the recommendations of COSOD-II, WG-1 and -5. The CEPAC watchdog for this program will be C. Sancetta

The University of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

February 1, 1988

Dr. Ulrich von Rad
Bundesanstalt fur Geowissenschaften
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D-3000 Hannover 51
Postfach 520253
Federal Republic of Germany

Dr. Nicklas G. Pisias
College of Oceanography
Oregon State University
Corvallis, OR 97331

88-058

RECEIVED FEB - 4 1988

Dear Ulrich and Nick:

We write to further explain our rationale for our proposed Exmouth Plateau drill site (EP12) and to answer questions raised about this site at the Rome meeting of IOP on 21-23 October 1987. We choose to write a letter that addresses these questions specifically rather than generate a revised proposal that would require more decoding by the casual reader (say a PCOM member). We assume that this letter can simply be appended to our original proposal, JOIDES 288B.

It seems that the main question to be answered is what can be learned about the tectonic environment of the underlying basement rocks by coring the overlying sediments at locations EP12 and EP7 that we consider to be complimentary sites for this experiment (see attached figure). Our hypothesis as cartooned in the attached figure shows EP7 to be affected first by detachment faulting that should be evidenced by gradual but persistent subsidence recorded by Early Jurassic sediments. EP12 may also have been affected by such an Early Jurassic subsidence history, but the most prominent subsidence signature will be in the Late Jurassic-Early Cretaceous sediments that should record rapid subsidence due to high-angle normal faults that deformed and tilted the entire remaining crustal section at that time. We emphasize that the depositional environment evidenced by grain size, graded bedded turbidites, or lack thereof, is a parameter of equal importance with absolute depth, or change of depth. The goals for these drill holes are essentially the same as those advocated for ODP Leg 103 on the Galacia Margin off Iberia, although our drilling strategy is somewhat different.

Thus we hope to learn from the age and depositional environment what the history of subsidence was at each location so that these histories can be compared. This will not be an unequivocal designation of detachment faulting in one time/space framework and high angle normal faulting in the other, but the strong inference is that detachment faulting is associated with gradual subsidence and high angle faulting causes more rapid subsidence. The comparative timing and style of subsidence in the two areas is really the critical element.

As was pointed out at the IOP meeting, it is critical to drill EP12 to the base of the syn-rift (Jurassic) section. If this poses a safety problem we would be glad to help the co-chiefs locate an alternate site for EP12.

There seems to be some feeling from IOP that EP2A is nearly as important as EP12. We do not believe this to be the case because we do not know of data from EP2A that documents either its tectonic environment (underlying fault structure) or even the nature of the crust at that location (continental, oceanic, or right at the boundary). Until advocates for EP2A can answer these questions in the manner in which we have addressed them at EP12, we shall continue to advocate the EP12 site as a clear alternative to EP2A.

Sincerely yours,

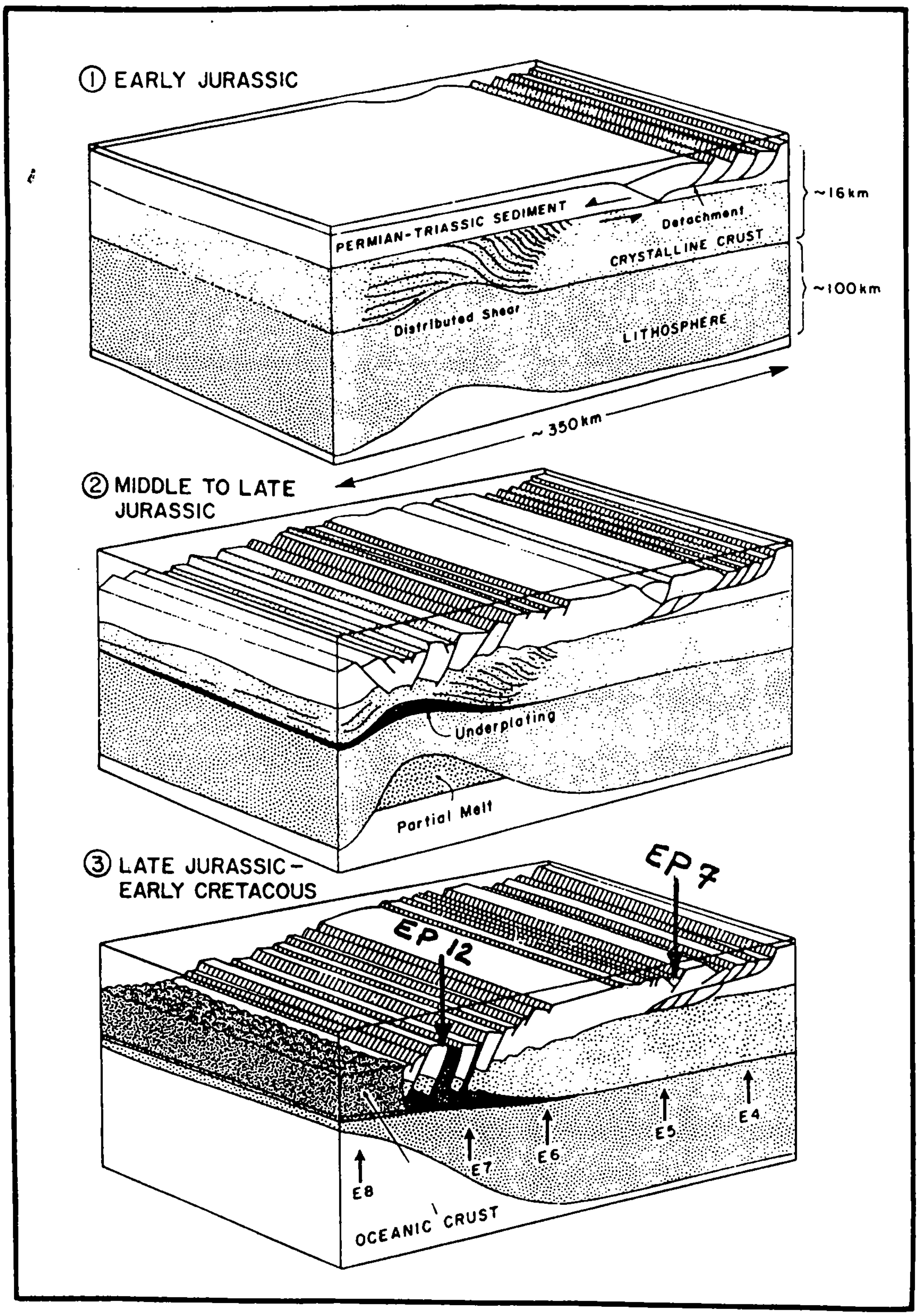
Roger L. Larson

Roger L. Larson

John C. Mutter

John C. Mutter

RLL:JCM:cs
cc/R.Schlich
I.Dalziel



① EARLY JURASSIC
PERMIAN-TRIASSIC SEDIMENT
Detachment
CRYSTALLINE CRUST
~16km
~100km
Distributed Shear
LITHOSPHERE
~350km
② MIDDLE TO LATE JURASSIC
Underplating
Partial Melt
③ LATE JURASSIC - EARLY CRETACOUS
EP 7
EP 12
E4
E5
E6
E7
E8
OCEANIC CRUST

United States Department of the Interior

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

January 26, 1987

MEMORANDUM

TO: Nick Pisias, Chairman JOI-PCOM

RECEIVED FEB - 5 1988

FROM: Mahlon Ball, Chairman JOI-PPSP

SUBJECT: PPSP meeting of 12/6/87

The meeting was held at the Bedford Hotel in San Francisco, CA.

Attendance:

Mahlon Ball, JOI-PPSP
David McKenzie, JOI-PPSP
Lou Garrison, ODP-TAMU Liason and ODP Safety Comm.
Kevin Burke, ODP Safety Comm.
Thomas Thompson, ODP Safety Comm.
Hank Wories, ODP Safety Comm.
Nick Pisias, JOI-PCOM Liason
Carl Brenner, JOI Site Survey Data Bank
Jeffrey Weissel, Leg 121 Co-Chief Scientist

Meeting Synopsis:

Lou Garrison reviewed current drilling on Leg 118 on the SW Indian Ocean Ridge.

The Safety Panel decided to review requested location changes for Leg 120 sites SKP3B and SKP3C, by mail and phone.

Jeffrey Weissel presented a summary of scientific goals for proposed drilling on the Central (CNR) and Southern (SNR) Ninetyeast Ridge.

The Safety Panel conducted a site by site analysis of proposed drilling locations on CNR and SNR.

CNR-1, Disapproved because site is structurally high, has potential for reservoirs, seals and biogenic hydrocarbons from lignitic source rocks, in this region.
CNR-2, Approved as proposed.
CNR-3, Approved as proposed.
CNR-4, Disapproved for some reasons as CNR-1.

SNR-1, Approved as proposed.
SNR-2, Approved as proposed.
SNR-3, Approved as proposed.
SNR-4, Approved as proposed.

Jeffrey Weissel presented a summary of scientific goals for proposed drilling on Broken Ridge (BR).

The Safety Panel conducted a site by site analysis of proposed drilling locations on BR. The panel approved sites BR-1 to BR-4 as proposed and agreed to allow Weissel the freedom he requested in positioning BR-1 to insure adequate soft sediment to spud in the hole.

Nick Pisias reviewed results of the PCOM-PANCHR meeting of 11/30-12/4/87, in Sunriver, OR.

Thomas Thompson reviewed Leg 116 drilling. The Safety Panel was displeased to learn that the drill ship's seismic system had not been used to verify positions on approved site locations. The scale of possible navigation discrepancies between site survey vessels and the drill ship make use of the drill ship's seismic system a must from a safety standpoint, generally; and, invariably highly desireable from a scientific standpoint. The Safety Panel requests that the above points be emphasized in ODP instructions to future Chief Scientists.

March 9-10/1988 was tentatively selected as the date for the panel's next meeting in London to review sites on Legs 122 and 123. Exmouth Plateau and Argo Abyssal Plain, respectively.

M. [illegible] M. [illegible]

RECEIVED MAR 2 9 1988

DRAFT REPORT OF THE ODP EAST PACIFIC RISE WORKING GROUP

Prepared by the Working Group members:

Keir Becker

John Delaney

Bob Detrick

Earl Davis (Chairman)

Craig Forester

Jean Francheteau

Steve Howard

Ken Macdonald

Mike Mottl

Mike Perfit

Ralph Stephen

Rob Zierenberg

SUMMARY (I have written a summary, but I am not happy with it and have not included it here. It is an important part of this document, and it must be done well. I will re-write it when I have a chance, unless someone would like to volunteer in the meantime...)

INTRODUCTION

The investigation of magmatic and hydrothermal processes at mid-ocean ridges has been identified as an important thematic objective for the Ocean Drilling Program by both COSOD I and COSOD II, as well as the JOIDES Lithosphere Panel. Drilling will also be an important component of the broader, multidisciplinary studies of the crustal generation process envisioned in the RIDGE research initiative. The recommendations contained within these earlier reports and white papers have provided the general guidelines within which we have developed the long-term goals and strategies of an East Pacific Rise drilling program.

COSOD I identified as its highest priority lithosphereic drilling objective the establishment of one or more "natural laboratories" at both fast and slow spreading ridges. As defined by the COSOD I Report, the natural laboratory concept includes "arrays, or clusters of holes, some deep, some relatively shallow, grouped together in fours or fives in particularly critical (active) parts of the ocean floor.... They would be used for emplacement of sophisticated instruments, some during the drilling period, and others for long-term monitoring after drilling had ceased. Within each laboratory complex, one hole would be targeted for deep penetration to allow sampling material from hitherto unreached levels in the ocean crust."

The JOIDES Lithosphere Panel (LITHP) has described in its White Paper the unique contributions drilling can make to ocean ridge studies. These include: 1) sampling deeper crustal levels, not generally accessible at the sea floor, 2) providing a vertical stratigraphy of lavas, unavailable from dredging, that can be used to investigate temporal variations in magmatic activity, 3) "ground-truthing" geophysical horizons that can be mapped much more widely and cost-effectively using other geophysical techniques, and 4) borehole logging, downhole experiments and long-term geophysical monitoring. LITHP has favored a hydrothermal emphasis for EPR drilling with the principal theme being the contrast in hydrothermal processes at sedimented and sediment-free ridge crests. Its highest priority objective is the completion of a single, deep hole in an active hydrothermal system. Secondary objectives include at least two shallower holes on an "L" pattern along- and across-strike, positioned close enough to permit cross-hole tomography and hydrogeologic experiments.

The Crustal Fluids Working Group and COSOD II also established as its highest priority the drilling of a deep hole into the high-temperature reaction zone immediately above a well-imaged magma chamber. They suggested that this hole should be sited some distance (hundreds of metres) along-axis away from a discharge site. Other high drilling priorities of this group were an array of shallow holes into an active discharge zone, and a deep-penetration hole in the distal portion of the crestal recharge zone (a few kilometres off axis). The Mantle/Crust Interactions Working Group at COSOD II assigned a somewhat lower priority to ridge crest drilling. Noting the technical difficulty of deep penetration in young, hot basaltic crust, they favored a suite of shallow drill holes along-strike in young lithosphere (not necessarily zero-age) and at least two cross-strike lines, one near the elevated mid-section of a spreading cell, and one near a ridge axis discontinuity. The Brittle/Ductile Working Group included as an objective in their report the determination of the insitu stress conditions in the crust in the vicinity of the ridge crest.

In both the COSOD II and RIDGE Reports, drilling is viewed as only one component of a broader, long-term investigation of mid-ocean ridge processes that will also include detailed surface geological mapping and sampling, geophysical experiments, and concurrent monitoring of magmatic and volcanic activity, hydrothermal output, biological activity and watercolumn geochemistry at one or more well-documented and carefully selected sites. In all likleyhood, ocean-bottom "volcano observatories" may take a decade or more to develop and ultimately establish. Furthermore, an array of holes sufficient to address the fundamental problems at hand cannot be completed with two or three drilling legs. However, integration of an initial drilling program into a longer-term multidisciplinary program is considered to be extremely important, however, and the EPR drilling program described in this report has been designed with this integration in mind.

LONG-TERM GOALS

In the broadest terms, the goals of ridge crest studies are to understand the magmatic, tectonic and hydrothermal processes that are involved in the formation of oceanic crust at sea floor spreading centres. Much remains poorly understood about the composition of partial melt and the way that it is supplied from the upper mantle to form the oceanic crust, about the way that it is modified during residence in crustal-level magma chambers, about the way that heat is extracted from the crust by hydrothermal circulation, about how hydrothermal fluids interact chemically with crustal rocks to redisribute elements within the crust and exchange them between the crust and the oceans, about the rate controlling factors of tectonic, magmatic, and hydrothermal processes, and about how all of these processes interact. To hope to understand these numerous processes, an efficient strategy that employs a variety of tools must be developed.

Fortunately, a fundamental property of sea floor spreading recently has been recognized that allows future ridgecrest investigations to be limited to a reasonable scale; this property provides an excellent framework for making critical observations efficiently in order to refine our understanding of crustal formation. Within the past five years, high resolution mapping of the seafloor has demonstrated that the East Pacific Rise and other medium to fast spreading ridges are segmented at the 50 to 150 km scale. This segmentation is recognizable primarily in the volcanic morphology and the tectonic structure of ridge crests, and to a certain degree in hydrothermal activity, in sub-surface structure, and in lava compositions. Many working hypotheses concerning segmentation have been put forward. They range from proposals for the fundamental cause of segmentation, believed to be related to the natural focusing of partial melt ascending from the upper mantle, to descriptions of the various consequences of segmentation, such as variations in crustal structure and in hydrothermal history along segments from their centres to their distal ends. Although most of these hypotheses remain incompletely or poorly tested, it is clear that segment-scale processes are fundamental ones, i.e. that a ridge segment represents the unit element of sea floor spreading. Therefore, any long-term mapping and observational program designed with a goal of understanding the sea floor spreading process on a global scale can begin with the proper characterization of the process on the scale of a single ridge segment.

To accomplish this task, an integration of a variety of studies is required. Regional and detailed systematic mapping of the sea floor, the sub-surface, and the overlying water column, detailed sampling of rocks in outcrop and fluids from vents (done in morphological and structural context), hydrologic studies, and long term observational programs of time-dependent process are examples of the necessary elements of such an integrated, segment-focused program. Drilling, including deep sampling of rocks and fluids as well as logging and other short and long term down-hole experiments is another critical part.

Drilling is an expensive and high-risk operantion, and great care must be taken to apply drilling only to problems that can be treated efficiently by no other means than deep sampling and observation. In consideration of this, the use of well-exposed ophiolites in studying ridge processes must be considered also. Much has been learned about ridge crest processes through ophiolites, but there are many things that cannot be learned and can be approached only by deep ocean drilling for the following reasons: 1) Sampling and observations can be made in proper context of the geometry of the ridge segment and its elements. This applies to those things that vary on the full segment scale (such as first-order crustal structure, and petrological and geochemical variability), or on a much smaller scale (such as the heat and chemical exchange in a high-temperature hydrothermal system). Many processes will never be fully understood unless studies are carried out in full environmental context. 2) Observations of processes that are active only at or near a ridge crest can be made in the active phase of those systems. Only in this way can the physics and chemistry of high-temperature water-rock interaction, crustal alteration, and the mechanisms of heat loss from a magma chamber be studied directly.

In light of these general guidelines and goals concerning magmatic, tectonic, and hydrothermal processes active at a ridge crest, the following more specific goals for a drilling program have emerged as being technically well justified and important.

1) One of the least well understood yet most important processes involved in crustal formation is the way that high temperature hydrothermal fluids thermally and chemically interact with rocks at depth at ridge axes. Surface observations offer poor constraints on the temperatures, depths, and rates of reactions. Postulated rates of heat exchange have such a wide range that it cannot be determined whether axial magma chambers can exist in steady state or as ephemoral features only. Maximum temperatures, and the factors limiting these temperatures are also poorly understood. The chemistry of fluid-rock interaction is virtually unknown.

Strong axial reflectors, presumed to be magma chambers, have been imaged along much of the East Pacific Rise. They often occur at a relatively high level in the crust (1 - 1.5 km) and thus they provide a realistic target for sampling and observing fluids, rocks, physical conditions, and depths of the permeable and impermeable sections of young, high temperature oceanic crust.

2) Another important part of high temperature hydrothermal systems that is poorly understood is the near-surface environment at sites of fluid discharge. Sub-seafloor reactions, including precipitation and rock alteration, are controlled in large part by fluid mixing due to entrainment of shallow-level interstitial fluids into the high temperature discharge zone. While these processes are extremely important to study, particularly in order to address the process of ore genesis, they are difficult targets to drill in most sea floor hydrothermal systems because of their small size and ephemeral nature. Naturally, the probability of intersecting this important zone is enhanced by drilling an area with the largest integrated hydrotheral flux, which is a function of both the intensity and duration of hydrothermal activity. Presently known hydrothermal systems on the East Pacific Rise appear to be of insufficient size to justify drilling the numerous, closely spaced, relatively shallow basement holes which would be required to observe this part of the axial hydrothermal system well. This goal may have to be met elsewhere, although such a program should be carried out in the strategic context of the East Pacific Rise drilling program, regardless of location.

3) Observations in ophiolites and limited observations in crustal sections drilled on ridge flanks suggest that significant chemical exchange occurs between the crust and circulating interstitial fluids at relatively low temperatures. These reactions must begin in recharge zones right at the ridge crest and continue for millions of years on the ridge flank. Understanding this part of the hydrothermal process is important as it may have a significant influence on the chemical balance of certain elements in the oceans, on the physical properties of the crust, and on the chemical properties of the crust, particularly by the time it is recycled into the mantle by subduction. Again, fluid and rock sampling is the only way that the nature and consequences of prolonged hydrothermal circulation can be determined. Sites at and near the ridge axis are critical in documenting the rates and integrated fluxes involved in this process, although a complete study must include sites in much older crust as well.

4) An ancilliary, but very high priority goal to be kept in mind while planning any drilling on the East Pacific Rise is to provide "ground-truth" for any geophysically recognizable horizons. Seismic reflection and new electromagnetic methods provide efficient, relatively inexpensive ways to map certain boundaries, but they do not provide enough information to unambiguously constrain the nature of these boundaries. Sensible siting of holes with respect to clearly imaged horizons is a

simple thing to do, but it must not be overlooked.

5) Lavas supplied to ridges are known to be compositionally an petrologically quite variable. These variations contain information about the physics of melt supply to and storage in a crustal-level magma chamber, and about the compositional variations of the upper mantle supplying the melt to the crust. Unfortunately the relative ages of surface samples cannot be well determined and the sample population is often poor; thus the meanings of the variabilities are at best difficult to determine. Core samples can provide unique, stratigraphically disposed samples essential for these studies.

RIDGE-SEGMENT SELECTION CRITERIA

In order to provide the best sites to address these scientific objectives, the ridge segment selected for drilling should possess a number of characteristics. Three of these are considered to be essential, particularly in terms of the highest priority objective.

1) The axis of the segment should be well representative of a "fast" (c. 50 mm a-1 half rate) spreading ridge. A well-developed central volcanic ridge (domed or rectangular in cross-section) should be split by a discrete central rift zone. The most "representative" axial structure is considered to lie south

of the Rivera Fracture Zone. The segment should be north of the Siqueiros Fracture Zone to avoid being too close to the magnetic equator.

2) The central portion of the segment axis should possess a robust axial seismic reflector to provide a clear drilling target for the primary deep hole. The cause of axial reflectors may to some degree still be debatable (magma, partial melt, or simply unfractured rock), but it is certain that high temperatures are present at that depth. Naturally, the reflector should be shallow to optimize the chances of penetrating the full section of crust above the reflector. It should be broad enough to extend well beyond the central rift zone.

3) Vigourous hydrothermal activity should be evident in the form of high-temperature fluid discharge at the sea floor within the rift zone, or in the form of warm fluid discharge, the composition of which indicates that high-temperature end-member fluids are represented.

Other important segment characteristics also are implied by the goals enumerated above:

4) The history (out to c. .5 Ma) of the segment should be well known and simple, so that any off-axis (up to c.20 km) drilling can be sited in context of the segment geometry present at that time. The position of the distal ends of the segment should be relatively stable.

5) The segment should be bounded on at least one of its

distal ends by a well developed overlapping spreading centre offset.

6) A sharp contrast in acoustic and electrical properties has been observed in the upper crust at depths of a few hundred metres. This is inferred to occur at the boundary between extrusive lavas and dikes. Such a boundary should be idetifiable in the crust of the segment chosen so that the inferrence can be verified and specific drilling sites can be chosen in light of the knowledge gained about the thickness of the extrusive layer.

7) The segment should display relatively simple variations in basalt composition along the axis, indicative of a single source for the volcanics. This property of the segment would reduce potential ambiguities in the study of magma chamber dynamics that could arise if complications were present. Sources from hotspots or other hetergeneities that could contribute to the magma supply along the chosen ridge segment should be avoided.

These criteria are appropriate for many other focused studies as well, in that they more or less define the "type" example of a fast spreading ridge segment. This commonality makes the integration of drilling and other detailed and long-term studies practical.

SCIENTIFIC STRATEGY (I will expand this section. Your comments are welcome at this point, however)

To study the problems outlined above as directly and efficiently as possible, a suite of eight holes is proposed. Clearly, only a portion of this program can be completed in the time available during the upcoming phase of central and eastern Pacific drilling. Four to six legs may be required ultimately. All holes address high priority objectives, however, and it was felt that all portions of the broader program should be discussed and included in the current phase of planning. This inclusiveness is essential, as many aspects of crustal formation and early evolution that can be examined through drilling are highly interrelated and should be considered together. This approach is also very sensible, as there is a range of technical difficulties associated with completion of the various holes. The holes have been ordered here according to their scientific importance, with the technically most difficult (but not unrealistically so) having the highest priority. If unforseen difficulties prevent this highest priority objective from being realized in the early part of a long-term program, the order can simply be revised in the context of the engineering constraints at the time.

The holes of the array, grouped in order of their scientific importance, are shown in Figure 1:

1) The greatest technical challenge must be met with a hole

that penetrates to a depth as close to the top of the axial magma chamber as possible (Figure 2). This hole should be situated near the ce ntre of the ridge segment and over a clear axial seismic reflector, but well outside the central zone of active fissuring and normal faulting (i.e. 1 - 2 km off-axis). The depth of penetration required for this hole is roughly 1 - 1.5 km below the sea floor, about 4 km below sea level. Completion of this most difficult hole in two drilling legs would be considered a success.

2) A second hole should penetrate the upper crust of the axial fissured zone, but not into an active discharge zone. This hole should penetrate through the intrinsically permeable extrusive layer of the crust and far enough into the underlying dike complex to characterize the thermal field and possibly the permeability there. Completion of this hole will require approximately 500 m total penetration.

3) A suite of three additional holes situated across the ridge segment summit will also compliment holes 1) and 2). This transect will allow a longer time sample of the petrologic variability of a single ridge segment to be studied, although to a certain degree this can be approached through surface sampling. More importantly, it will allow the time-dependent hydrothermal alteration of the crust to be studied. The primary objectives can be reached by drilling the extrusive section only (c. 300 m), although additional penetration into the upper 100 to 200 m of intrusive section would be valuable for chemical and hydrologic

studies.

4) A second suite of three holes along the segment axis and on the adjacent overlapping segment axis will compliment holes 1) and 2) and provide an along axis petrologic and chemical transect for determining the nature of the temporal and spatial variability of lavas erupted along the axis of the segment from its centre to its distal end. These holes should be sited in a position similar to 1), but penetration only of the extrusive layer is required (approximately 300 m).

5) A shallow hole or suite of holes in an axial discharge zone was considered to be a very high priority, but it was unanamously agreed that as yet, no discharge zone yet observed on the East Pacific Rise is sufficiently large or "mature" to warrent drilling. The objectives to be met with a hole or array of holes at a discharge site must be approached at another more suitable location.

The concept of completing closely-spaced holes for cross-hole geophysical experiments (seismic and electrical tomography, hydro-geology) was discussed, but owing to the immaturity of design and technical difficulty of such experiments, it was not considered realistic to include them in plans for EPR drilling at this time.

SITE SURVEY REQUIREMENTS

The segment of the East Pacific Rise that will be selected for drilling must have been studied extensively with an array of techniques in order to define 1) the general character of the segment in light of the criteria discussed above, 2) the distribution and magnitude of hydrothermal output of the ridge segment, 3) the detailed surficial geology of the ridge, including the petrologic characteristics, and the volcanic and tectonic morphology, and 4) the crustal structure at each of the drill sites, including the local engineering properties of the upper crustal section.

The chemistry and physics of the water column overlying the region containing the selected ridge segment must be determined in order to define the distribution and characteristics of plumes and to constrain the advective heat output from the ridge axis. Conventional hydrocasts and CTD surveys, reflectometry, and transmissometry provide useful information, although to provide adequate quantitative information about thermal and chemical fluxes, a three dimensional survey (including near-bottom work) using "tow-yo" CTD and nephelometry profiling (NOAA), dynamic hydrocasts (IFREMER), and current meter deployments are essential.

Detailed multi-beam bathymetry, regional acoustic imagery, detailed magnetics, etc. should be available so the history and regional structure of the ridge segment is well established. High-resolution side-scan sonar data (SeaMARC I, SAR, etc.) must be obtained with total coverage over the selected ridge segment, and in the vicinity of each off-axis site to assess the surface destribution of lava types, faults, and fissures.

It is essential to conduct a fine-scale program of rock sampling with a sample interval of 1 or 2 km. Well navigated dredging is suitable, although a submersible sampling program is highly desirable to provide the best chance to determine the relationship between the petrologic variability and the local volcanic environment. Also essential are detailed geologic maps in the vicinity of each drill site, particularly in the rift axis near hydrothermal vents; again, this is best accomplished using a submersible, perhaps in combination with ultra-high resolution side-scan sonar.

Determination of the seismic and electrical structure of the crust is also essential for proper selection of drill sites. Multichannel seismic reflection profiles (vertical and expanding spread geometries) are essential for defining the primary target depths for the primary axial site (the magma chamber) and all other sites as well (the lower limit of the extrusive layer). Seismic tomography and medium-scale electromagnetic sounding experiments would be extremely useful to define the average characteristics of the upper crust, particularly in the vicinity of the axial magma chamber. Detailed seafloor seismic refraction and deep-towed electrical conductivity surveys would be highly desirable for determining the engineering properties of the upper crust on a scale of tens of metres, so that the chances of penetrating highly incompetent material, particularly during the initial casing-in operations, are minimized. Other techniques which could provide constraints on structure at shallow and intermediate crustal depths include near-bottom magnetic and gravity profiling.

SPECIAL REQUIREMENTS FOR DRILLING AND DOWN-HOLE MEASUREMENTS

Although suitably detailed site surveys may enable us to avoid the worst drilling conditions (an approach that has not been used in the past), even the best conditions cannot be dealt with using present drilling techniques. The nature of the challenge to drilling and post-drilling operations can be described by enumerating some of the problems that are bound to be encountered and by reiterating some of the scientific requirements.

1) Incompetent extrusives. All of the holes proposed require penetration of very young extrusive basalts. The upper section of young oceanic crust is known to be one of the most difficult formations to drill and sample. Young basalts posess hard glassy rinds. Composite extrusive formations tend to be poorly consolidated. Rapidly cooled material is highly fractured. Fractures, faults, and fissures generally are not

cemented by alteration products or hydrothermal deposits. Buried sections of talus and other zones of rubble must be anticipated. Before any program on the East Pacific Rise can begin, it is essential that a drilling technology be developed and tested that is suitable for establishing re-entry sites and for penetrating and recovering several hundred metres of this troblesome section.

2) Deep penetration. The primary scientific target of the proposed program is the hydrothermal reaction zone above the axial magma chamber, which will require a hole at least 1 km deep, to a total depth of about 4 km below sea level. Drilling conditions should improve below the upper few hundred metres of extrusive section as more massive volcanics are penetrated. However, low penetration rates, short bit life, hole instability, poor recovery, incomplete flushing of cuttings, and other problems have plagued young crustal drilling at all levels in the past. Major improvements in the ODP capabilities are required for successful deep drilling with adequate (>50%) core recovery.

3) High temperatures. Temperatures up to and possibly exceeding 400 degrees Centigrade, are bound to be encountered in the highest priority holes. The drilling strategy proposed here does not call for drilling directly into a high-temperature discharge zone; in fact, much of the section even in the deep hole may be cooled by regional hydrologic recharge. Nevertheless, the primary target in this hole is the deep hydrothermal heat and chemical exchange zone, where extremely

high temperatures must be expected. The high priority of this objective requires that ODP have the capability to drill into this zone without sacrificing core recovery and control of the hole. Both the direct (thermal) and indirect (chemical) consequences must be considered for both drilling and down-hole operations. More specifically, attention must be given to bit and core barrel design in light of the high temperatures and caustic formation fluids (pH as low as 3, H2S concentrations as high as 200-300 ppm), and to controlled circulation metred to minimize the effects of high formation temperatures and maximize hole cleaning while at the same time keeping to al minimum the thermal stressing and spalling of the borehole wall (as is postulated to have occured at Hole 504B at 150 C.

4) Down-hole operations. A complete program of logging and short and long term measurements is crucial to the objectives of EPR drilling, and the engineering developments required to allow EPR drilling must be integrated with those necessary to enable logging and downhole measurements. In particular, 1) if a smaller diameter coring system is used, it must not produce a hole that is too small to log and instrument, and 2) many of the logs and short term measurements will probably require the ability to circulate to temporarily cool the holes. Slim-line tools to log several basic properties at high temperatures 250-450 C) are available from several sources, but it will also be critical to log with more sophisticated tools that are presently

available only in standard sizes rated to 100-150 C. Obtaining these data will require a minimum hole diameter of 4 inches, tool modifications for enhanced temperature ranges, and the ability to circulate while logging to cool the tools.

5) Hole isolation and long-term instrumentation. The proposed EPR drilling should be viewed in the context of a long term effort to establish a natural laboratory, a primary focus of which is the study of active hydrothermal processes in zero-age crust. This long term effort will include coring, logging, and short term downhole measurements from the drilling ship, as well as a variety of possible hole-to-hole experiments, seafloor experiments, and long term downhole measurements that may involve other ships and/or submersibles.

Allowing for post-drilling experiments poses a major technological challenge: If the EPR holes are left open, significant, possibly permanent disturbances may be introduced via the ocean bottom water that may invalidate measurements of critical parameters of the hydrothermal system. To properly document temperatures, fluid pressures, fluid flow rates, and fluid chemistry deep within the system, it will be necessary to seal the boreholes after drilling them, and allow the fluids and formation to return to in situ conditions. Inert, drillable seals will be required at the top of the hole to prevent contamination by cold ocean bottom water, and possibly at greater depths to prevent convective mixing of fluids within the borehole.

At least two options have been proposed for these seals: 1) valve-like seals that could be penetrated by either the drillstring or by wireline reentry and would reseal afterwards, or 2) semi-permanent seals (possibly drillable packers) that could be removed or penetrated only with the drillstring. Given the importance of measureing the most basic parameters at truly in situ conditions, the EPR Working Group favoured the latter simpler option for the initial legs of a long-term EPR program. High temperature sensors and fluid sampling tubes could be sealed into the holes and wired or piped through the seals to the seafloor, where data could be recorded and samples could be collected by a submersible or ROV. Such a system would involve two major challenges: designing the measuring devices and seals to survive the conditions enumerated above, and actually emplacing them from the drillship.

While some of these problems will be encountered in other high-priority ODP programs (e.g. sedimented ridges, deep crustal drilling off-axis), they will probably be most severe in the case of the East Pacific Rise. Therefore, the EPR drilling will depend to a greater degree on engineering developments, and will serve to focus the ODP engineering effort in support of crustal drilling. With the successful development of the hard-rock guidebase, ODP has virtually solved the problem of spudding holes at unsedimented sites, but it needs the clear mandate, resources, and testing opportunities to continue the engineering effort that is essential for the success of all the crustal drilling proposed for the eastern Pacific, especially drilling at the East Pacific Rise.

ODP has already identified several options to be pursued for improving drilling and coring in basaltic crust, several of which implement the type of thin-kerf (2 cm), high-speed (500-800) diamond-bit technology used successfully in the mining industry. The advantages of narrow-kerf diamond-bit drilling over standard roller-cone bit drilling in fractrued crystaline rock are numerous. Perhaps the most significant are the lower torques and impact forces imparted to the formation. Destruction of the small degree of integrety that young basaltic formations do posess leads to short bit life, poor core recovery, and rapid jambing of the drill string by unflushed "cuttings" and collapsed wall fragments. The higher speed, lower and more constant force, smaller diameter, narrower kerf, and finer cuttings of the proposed new drilling technique should reduce these problems substantially. Another advantage resulting from smaller diameter, lesser clearance, and finer chip size is that far lower volumetric circulation rates are required. This may permit the use of special drilling fluids if they are required for mechanical or chemical reasons.

Drive systems under consideration include 1) the Navi-drill, potentially capable of 50-100 mbsf penetration, 2) downhole motors or turbines that could provide penetration to a depth of about 500 mbsf, and 3) a top-driven system that could be configured for a total length of 3000 or 5500 m below rig floor. In this last system, a full length of the small-diameter (3.5 inch) drill pipe would be deployed inside the standard ODP drill string which is coupled to the bottom to provide a "fixed" reference. Given the EPR requirements for deep epnetration and extensive downhole measurements, the EPR Working Group clearly perferred the last option, which was also endorsed by TEDCOM. This option is also promising for drilling sedimented ridges and deep crustal drilling, but it must be developed in a 4 inch diameter, 5500 m depth configuration.

Unfortunately, no simple system for providing adequate seabed coupling avoids the need for significant penetration (c. 50-100 m) of a larger diameter drillstring or casing. It is now well known that the shallowest section of the crust is most awkward to drill, and thus this may be the most difficult step in establishing all of the crustal holes proposed. Again, detailed geophysical studies may improve the chances of avoiding the worst conditions, but truely competent material is not likely to be found. ODP must be prepared to drill and case through potentially 50-100 m of unstable, rubbly basalt in order to ensure the success of this program.

SEGMENT SELECTION

Although discussions were kept as "generic" as possible, it was realized that time is short, and since much effort must be spent on detailed, site-specific investigations, little time can be wasted on segment selection. Much work has been on sections of the East Pacific Rise, certainly enough to begin intellegently to apply the criteria discussed. Two segments satisfy the criteria reasonably well and were considered to be appropriate candidates for the drilling program. The segment centred at roughly 9o 30' N was felt to be best as it possesses a particulary strong, wide, and shallow axial reflector (see Figure 2), and displays relatively uniform lava chemistry. Much detailed mapping and sampling needs to be completed to characterize the nature of hydrothermal ventillation along this segment, however. The segment centred at roughly 12o 50' N has been extremely well studied in this regard, and is vigourously active. Unfortunately, the axial reflector mapped beneath this segment is relatively narrow, extending little beyond the axial rift zone, and the lava chemistry is probably influenced by sources that are supplying near-axis seamounts. Nevertheless, it was felt that with the data in hand, a clear decision to focus on a single segment cannot be made. It should be emphasized, however, that as the success of any of the drilling in this program relies so heavily on site-specific studies, the selection of a segment should be made at the earliest possible time so that a concentrated effort can be put into the necessary detailed work.

ESTIMATED TIME FOR OPERATIONS

To carry out the EPR drilling program itself, the following schedule is considered realistic:

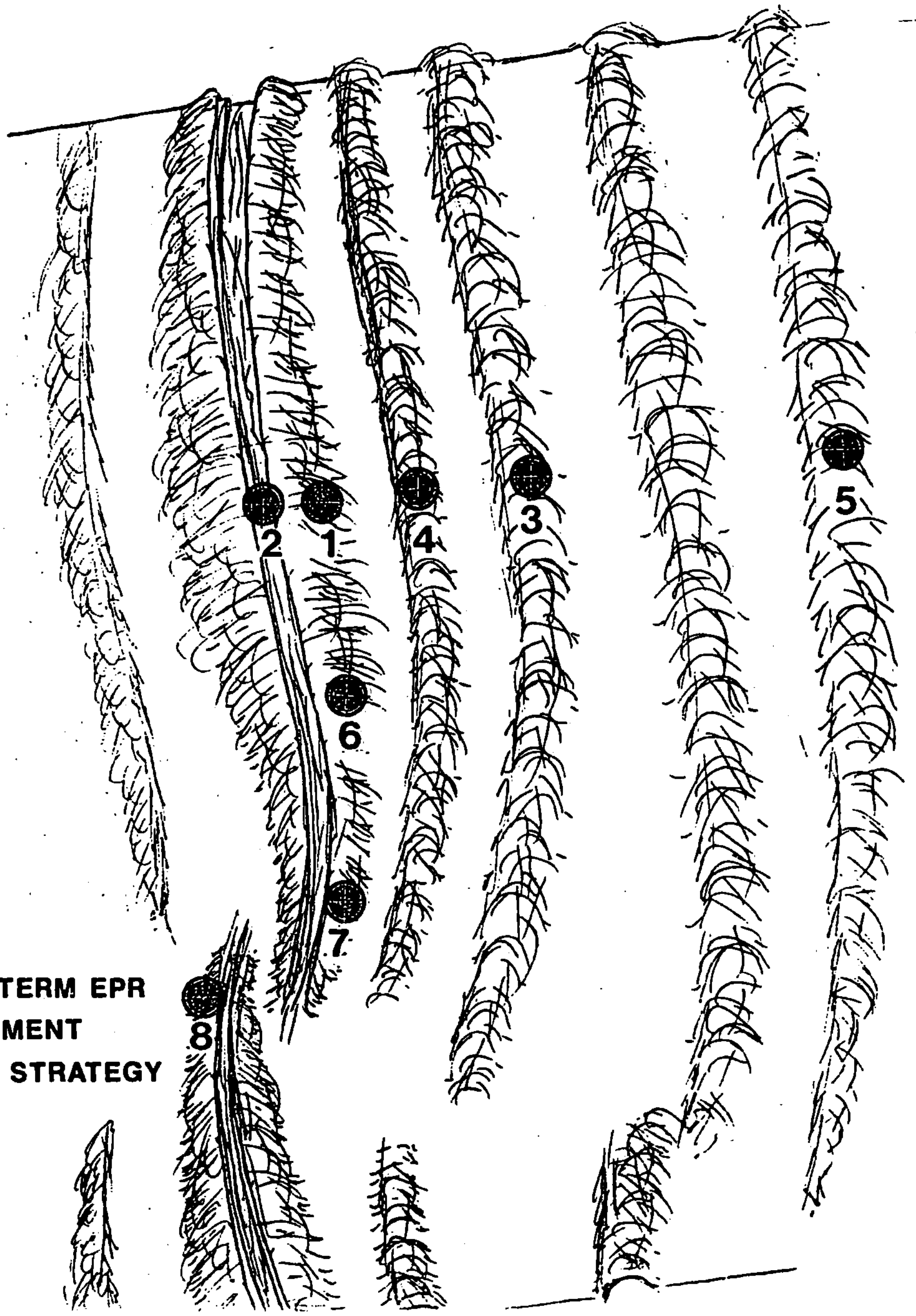
1) A portion of a leg (2-4 weeks) should be devoted to starting the highest priority hole (reentry + casing upper section) as early in the CEPAC schedule as possible.

2) If earlier engineering tests are successful, a full leg of drilling should be carried out at site 1.

3) If technically possible, a second full leg of drilling should be devoted to deepening the hole at site 1 to the target depth, and to logging, down-hole experiments, and final hole sealing.

If deep penetration is precluded at any point during either of the legs, drilling at the other sites that have shallower objectives should begin. All legs should be separated by as much time as the CEPAC schedule will allow; the two full legs devoted to deep penetration should be separated by at least 9 mo to 1 yr to allow adequate time to evaluate and overcome technical difficulties that may arise.

Completion of the full program will require more time than can be included in the upcoming phase of CEPAC drilling. It is difficult at this point in the development of the new drilling technology to predict accurately the time that will be required, but 2-4 additional legs probably is a reasonable estimate.



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SEGMENT
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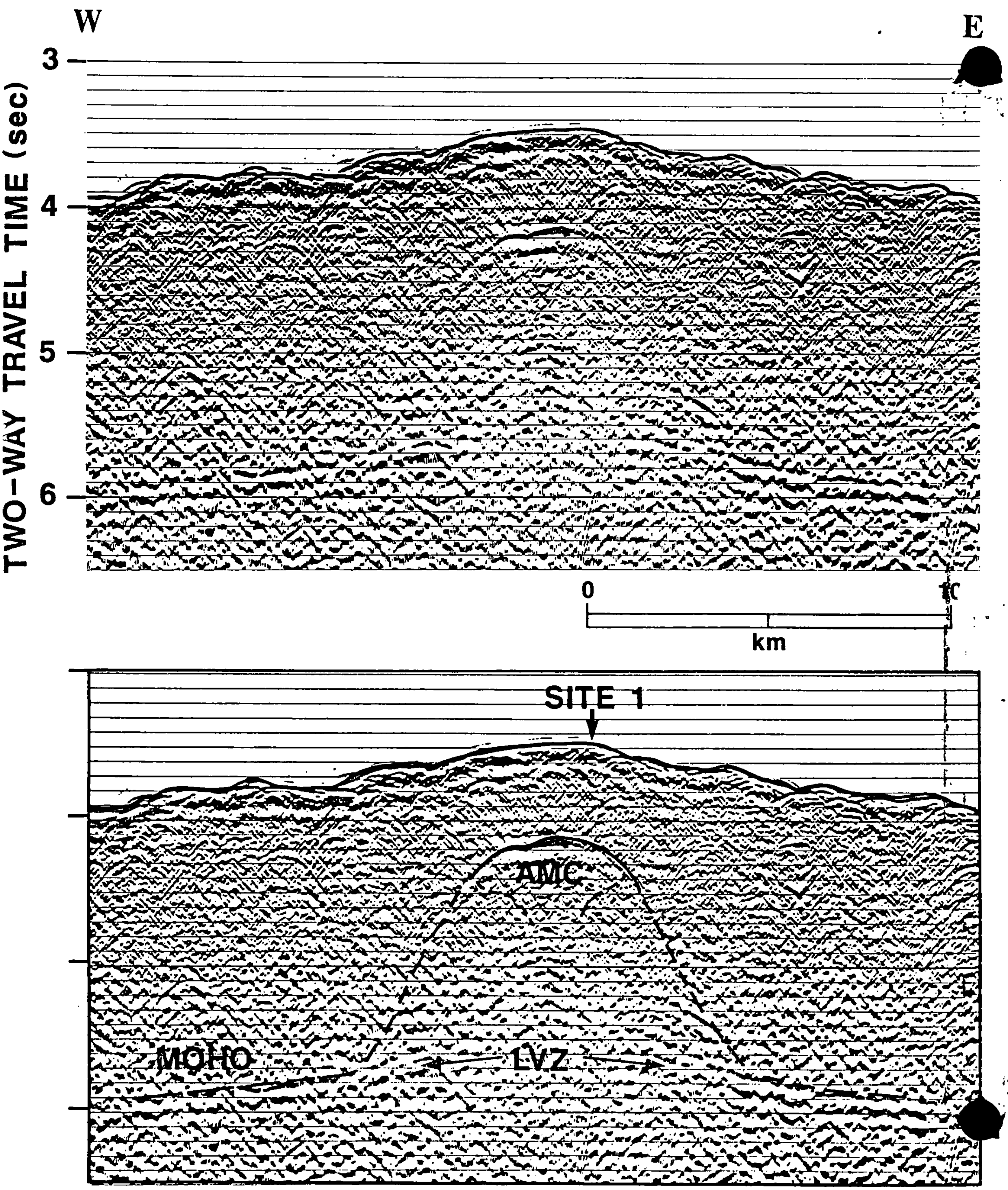

9° 30'N