PCOM Spring Meeting
Université Pierre et Marie Curie
Paris, France
(meeting at Société Géologique de France)
24-26 April 1990
Agenda

Page Number
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Additional Attachments

JOIDES MEETING SCHEDULE (04/04/90)

Date	Place	Committee/Panel
14-16 January, 1990	Santa Cruz, CA	SGPP
23-24 January, 1990	College Station, TX	DMP
13-14 February, 1990	Salt Lake City, UT	TEDCOM
27-28 February, 1990	Menlo Park, CA	PPSP
5-7 March, 1990	New Orleans, LA	LITHP
5-7 March, 1990	New Orleans, LA	TECP
6-8 March, 1990	Washington, DC	BCOM
7-9 March, 1990	College Station, TX	IHP
20-21 March, 1990	College Station, TX	SMP
29-31 March, 1990	Honolulu, Hawaii	OHP
5-7 April, 1990	Sidney, BC	EPRDPG
9-10 April, 1990	Menlo Park, CA	SSP
24-26 April, 1990	Paris, France	PCOM
12-13 June, 1990*	Iceland	PPSP
20-22 June, 1990	Washington, DC	EXCOM & ODP Council
28-29 June, 1990*	Seattle, WA	DMP
July, 1990*	Palisades, NY	SSP
Summer, 1990*	???	Cascadia DPG
14-16 August, 1990*	LaJolla, CA	PCOM
26-27 September, 1990*	College Station, TX	TEDCOM
2-4 October, 1990*	France	EXCOM
8-10 October, 1990*	Basel, Switzerland	IHP
9-12 October, 1990*	Brisbane, Australia	DMP
9-12 October, 1990*	Brisbane, Australia	SMP
11-13 October, 1990*	Tokyo, Japan	LITHP
19-21 October, 1990*	Canberra, Australia	OHP
1-3 November, 1990*	Paris, France	TECP
2-3 November, 1990*	Paris, France	SGPP
27 November, 1990*	Kona, Hawaii	Panel Chairmen
28 Nov.-1Dec., 1990*	Kona, Hawaii	PCOM
23-25 April, 1991*	Austin, TX	PCOM
June, 1991*	Cardiff, Wales	ex-IOP & Co-Chiefs
20-22 August, 1991*	Hannover, FRG	PCOM
3 December, 1991*	Univ. Rhode Island	Panel Chairmen
4-7 December, 1991*	Univ. Rhode Island	PCOM

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

JOIDES RESOLUTION OPERATIONS SCHEDULE

LEGS 129 - 139

LEG	AREA	DEPARTURE LOCATION	DEPARTURE DATE	ARRIVAL LOCATION	ARRIVAL DATE	IN PORT	DAYS AT SEA*
129	Old Pacific Crust	Guam	11/24/89	Guam	01/19/90	01/19 - 01/23	56
130	Ontong Java	Guam	01/24/90	Guam	03/27/90	03/27 - 03/31	62
131	Nankai	Guam	04/01/90	Pusan, Korea	06/02/90	06/02 - 06/06	62
132	Engineering II	Pusan, Korea	06/07/90	Guam	08/05/90	08/05 - 08/09	59
133	N.E. Australia	Guam	08/10/90	Brisbane, Australia	10/11/90	10/11 - 10/15	62
134	Vanuatu	Brisbane, Australia	10/16/90	Suva, Fiji	12/11/90	12/11 - 12/15	56
135	Lau Basin	Suva, Fiji	12/16/90	Papeete, Tahiti	02/16/91	02/16 - 02/20	62
136	Engineering 3A (504B)	Papeete, Tahiti	02/21/91	Panama	03/30/90	03/30 - 04/03	37
	Engineering 3B (EPR)	Panama	04/04/91	San Diego	05/16/91	05/16 - 05/20	42
137	Sedimented Ridges 1	San Diego	05/21/91	Victoria, B.C.	07/22/91	07/22 - 07/26	62
138	E. Equat. Pac. Neogene	Victoria, B.C.	07/27/91	Panama	09/25/91	09/25 - 09/29	60
139	504B or EPR-1	Panama	09/30/91	Panama	11/29/91	11/29 - 12/03	60

Revised 12/12/89

*Schedule subject to change pending detailed planning after Leg 132

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Agenda Notes

0900 Tuesday 24 April 1990

Item A
Introduction

Welcome, and comments about meeting logistics (Y. Lancelot).

Introduction of PCOM members, panel chairmen, liaisons, and guests.

Item B.
Approval of Minutes of 27-30 November 1989 PCOM Meeting at Woods Hole Oceanographic Institution

The attached revised draft minutes include corrections received at the JOIDES Office through 4 April.

Call for additional corrections or additions; call for approval.

Item C
Approval of Agenda

Comments about the scheduling of the meeting and the organization of its agenda (R. Moberly).

The main purpose for the Spring Meeting is to plan the general direction of the drilling vessel for the next four years. Two important but subordinate purposes are to adjust the planning structure to prepare for that four years in general and for Fiscal Year 1992 in particular, and conduct routine PCOM business.

Call for additions or revisions to the Agenda; call for its approval.

Item D
ODP Status Reports by Liaisons

EXCOM (R. Moberly). EXCOM has not met since last October. By mail procedures, the non-US members of EXCOM decided that Dr. Peter Blum will be the next international liaison in the JOIDES Office.

NSF (B. Malfait)
- Resource issues and status of the budget.
- The crystal ball: ODP membership; planning for renewal
- Areas of support of US field programs
- Other information.

JOI (T. Pyle)
- Illustration of the current perspective from Washington.
- Status of the FY90 Program and development of the FY91 Program Plan and its budget.
- Negotiations with other international scientific programs of global scale.
- Negotiations with Sandia Labs to adapt high-temperature tools.
- ODP brochures; status of the Long Range Plan.
- JOI and JOI Board of Governors actions that affect the drilling program.
- Other information.

Science Operator (L. Garrison)
(Engineering report to follow panel reports)
- Operations of the *JOIDES Resolution* since last PCOM meeting: legs 129 (Old Pacific), 130 (Ontong Java Plateau), and 131 (current: Nankai)
- Near-term planning, 1990: legs 132 (Engineering II), 133 (Northeast Australia), 134 (Vanuatu), and 135 (Lau Basin).
- Publications schedule.
- Co-Chief Review and other recent meetings.
- Deputy Director and other personnel matters.

Wireline Logging (R. Jarrard)
- Operations since last PCOM meeting.
- BRG developments at Lamont.
- Personnel changes and other developments.

Identification of Action Items following ODP reports

Item E
JOIDES Status Reports by PCOM Liaisons
(excluding (a) membership issues, which will be covered Thursday, and (b) for thematic panels, details of rankings of programs, which will be covered Wednesday morning)

LITHP (R. Duncan; J. Natland)
LITHP met 5-7 March 1990 in New Orleans, including a joint meeting with TECP. Draft minutes are copied herein. In addition to decisions on 1990-1994 priorities, and panel membership (& chair), LITHP reviewed proposals; gave its strategy for work on the third engineering leg (scheduled as Leg 136); recommended formation of a technical task force to examine long-term strategies for very deep drilling; and recommended formation of a working group for volcanic rifted margins. During the joint meeting with TECP these topics were discussed: very deep drilling, volcanic rifted margins, recent drilling and engineering advancements, the tectonics of mid-ocean ridges, and global seismic arrays.

OHP (G. Brass; R. Moberly)
OHP met 29-31 March in Honolulu. Draft minutes are copied herein. In addition to decisions on 1990-1994 priorities, and panel membership, OHP reviewed proposals; listed programs in the Antarctic, South Atlantic, and off Somalia for possible higher ranking when reconsidered for April 1991; reaffirmed that the Eastern Equatorial Pacific Neogene program scheduled for Leg 138 remains OHP's highest-priority undrilled program; commented on publication target schedules and the involvement of the Editorial Board; and , because of OHP interest in paleo-productivity studies that require that organic-rich sediments be recovered near continental margins, asked for a refinement of methods by which safety is established in drilling.

SGPP (G. Brass; R. Moberly)
SGPP met 14-16 January in Santa Cruz. Draft minutes are copied herein. In addition to decisions on 1990-1994 priorities, and panel membership, SGPP reviewed proposals; listed 6 programs for possible higher ranking when reconsidered for April 1991; revised and expanded its White Paper; and discussed microbiology, technology, and sampling issues.

TECP (B. Tucholke)
TECP met 5-7 March in New Orleans, including a joint meeting with LITHP. In addition to decisions on 1990-1994 priorities, and panel membership, TECP reviewed its remaining proposals. During the joint meeting with LITHP these topics were discussed: very deep drilling, volcanic rifted margins, recent drilling and engineering advancements, the tectonics of mid-ocean ridges, and global seismic arrays.

DMP (M. Langseth)
DMP met 23-24 January in College Station. Draft minutes are copied herein. DMP re-affirmed and amplified its recommendations about high-temperature logging, and showed its concern about: lack of logging of 801C; creation of slim-hole logging capabilities; shipboard computing pertaining to downhole measurements; integrated core and log data; tools under development; downhole measurements in 504B; and the technology of measurement-while-drilling.

IHP (J. Watkins)
IHP met 7-9 March in College Station.

PPSP (R. Moberly)
PPSP met in Palo Alto on 27 and 28 February 1990. Draft minutes are copied herein. Sites for legs 132 (Engineering II), 133 (Northeast Australian Margin), and 134 (Vanuatu) were approved. Some of the 133 and 134 sites were adjusted slightly for safety considerations. On Leg 133 special care in monitoring will be demanded on several sites, especially those along the edge of the Townsville Trough. Both Co-chief Scientists, an additional geophysicist, and the organic geochemist for Leg 133 were present at the meeting; engineers were present for 131 and both Co-chiefs for 134.

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

Exmouth Plateau drilling, will be presented at the next PPSP meeting. PPSP requested an addition to membership.

SMP (M. Leinen)
SMP met 20-21 March in College Station.

SSP (J. Watkins)
Meeting was scheduled for 9-11 April in Menlo Park.

TEDCOM (J. Natland)
TEDCOM met 13-14 February in Salt Lake City. Draft minutes are copied herein. TEDCOM discussed the continued development of the 4500-meter version of the DCS, and inspected the DCS in the contractor's yard. Representatives of the thematic panels presented their technological objectives, especially with respect to deep drilling (see agenda item F below) and the recovery of undisturbed cores in unconsolidated sediment.

Identification of Action Items following JOIDES reports

Item F.
Special Reports that will Influence Planning of the Intermediate Future

BCOM (R. Moberly)
The Budget Committee met 8-10 March 1990 at JOI Inc. NSF provided a target figure for FY91 of $39.3 M from US and partner-country funds. EXCOM in 1988 had projected FY91 costs as $40.0 M. Requests totaled $41.6 M.

Main points of BCOM's recommendations to JOI follow: With minor exceptions the JOI-JOIDES, TAMU, and LDGO base budgets were approved as requested. Special Operating Expenses (SOE must be at least 4% of the total budget less the JOI-JOIDES budget) were assigned in 4 categories:
- Diamond Coring System, an additional $843 K to TAMU to accelerate DCS development to prepare for drilling in the FY91 Program Plan; exact distribution of DCS effort to be based on outcome of Leg 132;
- High-temperature logging, $180 K to LDGO to repackage slimhole tools donated by ARCO;
- Publications, $172 K to TAMU to print 4 volumes beyond the normal 12 volumes in FY 91 base budget; and

• Additional response to JOIDES advice
  - $450 K to replenish drilling supplies after abnormal recent loses
  - $137 K for shipboard measurements and information handling, including computers ($43 K for development of an ODP database on CD-ROM and $94 K for which PCOM will forward specific recommendations to JOI based on priorities of SMP and IHP)
  - $43 K for one-year trial for partial support of a specialist to reduce Formation Microscanner logs on board, and
  - $30 K for BRG to join CONOCO's logging-test consortium.

NSF stated it would consider arguments for additional resources above its target figure for a real increment in engineering and technology development. JOI is negotiating with Sandia Labs to adapt high-temperature tools for ODP purposes. BCOM recommended that JOI propose to NSF for $300 K for one set of 3 tools, and an additional $150 K for a duplicate set.

The FY91 budgetary flexibility resulted from a number of factors being favorable simultaneously, and it is not realistic to suppose these conditions will occur together again.

Deep Drilling (C. Sparks)
TEDCOM Chairman Charles Sparks will amplify the TEDCOM statement:

"Representatives of LITHP, SGPP, and TECP presented their technological objectives and particularly those related to deep drilling. The TEDCOM maintains its reserve as to their realism, and favours the creation of a task force composed of members of TEDCOM/TAMU/LITHP to discuss how to proceed. Access to Russian experience of deep drilling/coring must be obtained."

Engineering Developments (M. Storms)
Update on the DCS and other tools and procedures. PCOM would also appreciate current thoughts about potential use of the DCS within a drill-string that becomes a mini-riser.

East Pacific Rise Detailed Planning Group (J. Austin)
The EPR-DPG was scheduled to meet 5-7 April.

Identification of Action Items following these special reports.

0900 Wednesday 25 April 1990

Item G
Thematic Rankings of Programs

Panel rankings and statements of thematic interest in programs are given in panel minutes. The summary table compares the rankings of the four panels, and a table lists all programs that are ranked thematically.

Shall this be by panel liaisons, supplemented upon request by watch-dog reports?

Note also for LITHP:
- some ties in rankings.
- the difference in votes between rankings 1 and 2, 8 and 9, and 14 and 15 is relatively greater than between other adjacent rankings.
- unlike other panel procedures, LITHP panel members who were listed as proposal proponents could vote for their own proposals. An analysis at the JOIDES Office suggests that changes in ranking would have been of little significance if their votes had been excluded.
- The program ranked 1 is a new one and detailed site selection will require (scheduled) dives (Hess Deep); one of those two tied in next place will require the report.of the (scheduled) EPR-DPG; 6, 7, and 13 will require additional planning (multi-leg, multi-objectives at Vema Fracture Zone); 11 will require coordination with a working group requested by TECP and LITHP (North Atlantic Volcanic Margins); one of the two tied for 19th place will require coordination with DMP and SSP (Characterization of Lithosphere).

OHP:
- The Panel had difficulty deciding into which one or more of its principal themes it should place the multi-objective programs of the former CEPAC Panel; comments by the CEPAC and PCOM Chairs (guests) may have slowed rather than speeded the process.
- Within the CEPAC Atolls and Guyots program, OHP split the proposals and preferred Mesozoic Guyots (4th rank) to Marshall Atolls and Guyots (6th rank).
- The panel stressed the importance of high latitude drilling, not only in its high ranking of northern latitude proposals, but also by expressing its dismay that no good Antarctic proposals are available. An old proposal at the Ross Sea and new ones at the

Antarctic Peninsula-Bransfield Straights do not directly address important thematic objectives in those areas of Antarctic waters.
• The panel also will give closer review to at least 15 proposals that it hopes will be improved within a year. For thematic objectives, OHP especially needs improved South Atlantic proposals (upwelling in the east, Neogene and older paleoceanography in the west), and for improved deep-drilling capabilities (Somalia). Counting Antarctica, there therefore are 5 programs not ranked at this time, but they may be ranked higher next year.
• The program ranked 1 will require a DPG to plan the optimum attack (Atlantic gateway to Arctic), 3 requires success in its scheduled site survey (sea level, New Jersey margin); 7 (low-latitude South Atlantic), 9 (Southwest Pacific sea-level program), and perhaps 11 (Mediterranean Gateways) require detailed planning.

SGPP:
• In the transition from the former SOHP to the present SGPP (plus OHP), not all members of the new panel had reviewed four important older proposals. Also, apparent deficiencies in two recent proposals may be cleared soon. Therefore six programs are not ranked at this time, but may be ranked higher next year. They are listed at the bottom of the table.
• Several programs require (anticipated) advances in drilling, logging, and sampling.
• The program ranked 1 requires the report of its DPG (Cascadia); 5 requires success in its scheduled site survey (sea level, New Jersey margin); 6 depends on favorable outcome of discussions of a policy change from PPSP (Peru gas hydrates); 7 requires the report of its DPG (EPR); 8 requires a better focused proposal (Gulf of California hydrothermalism); 13 requires the outcome and evaluation of the current leg and success of the GEOPROPS Tool (Nankai II).

TECP:
• the difference between rankings 7 and 8 is relatively greater than between other adjacent rankings.
• "The Tectonics Panel is strongly in favor of drilling fast- and slow-spreading ridges, and 'offset' holes in order to investigate the structural evolution of the oceanic lithosphere. It is taking steps to formulate a drilling strategy to this end."
• "The Tectonics Panel wants to ensure that stress measurements are made at all suitable sites."
• The program ranked 2 will require a working group to aims and criteria for later specific planning of a multi-leg program (non-

volcanic rifted margins*); 3 requires the report of a scheduled DPG (Cascadia); 5 will require a working group to aims and criteria for later specific planning of a multi-leg program in conjunction with LITHP (volcanic rifted margins*); both components of 9 require careful site selection, which should be aided in one instance by a scheduled site survey (Antarctic Program)
* see also proposal for one or more Rifted-Margin working groups under Agenda Item J.

Item H
Setting the General Direction of the Drilling Vessel, Four Years to Spring 1994.

Here PCOM should consider mainly the thematic rankings, reviewed in Item G above.

PCOM should also consider advice from its panels, the Science Operator, and Wireline Logging about such factors as
- engineering preparedness,
- logging (and other tools) preparedness
- status of site surveys,
- weather or clearance problems.

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

A map showing the distribution of ranked programs is available to help to guide your inspiration.

The JOIDES Office hopes that PCOM will conclude this agenda item with a vote on a carefully worded motion (or motions), that follows one or more straw votes. We further hope that the straw votes will lead to some general consensus before the formal motion. We urge that the motion be written before it is offered orally. We suggest

that it be given in a form that breaks the route by years or fiscal years, with the first part firmer than the last part, for example:

"PCOM sets the direction of the drilling vessel for the next four years as follows:

(1) in the remainder of FY90 confirmed as is in the current program Plan;

(2) in calendar year 1991, confirmed as is in the Program Plan approved at its November 1989 meeting in Woods Hole, through Leg 139, Lower Crust at 504B (in the event 504B cannot be drilled, EPR bare-rock drilling will be substituted), ending in Panama on or about 29 November 1991,

(3) in the remainder of 1991 and into 1992, in the eastern Pacific as has been tentatively planned at its November 1989 meeting, namely, Chile Triple Junction 1 and 2, EPR 1 or 2, Cascadia, and Sedimented Ridges 2.,

[or (3) an alternate program, to be finalized next November]

(4) in late 1992 through April 1994, in the general direction of highly ranked programs in the [.... list one or more general areas of the ocean, for example, 'Indian Ocean followed by Western Pacific'...].

PCOM reaffirms its stand that at its spring 1991 meeting, and at subsequent spring meetings it will evaluate again the state of panel recommendations, technological developments, and the overall state of the ODP Program, and again set the general direction of the drilling vessel for the subsequent four years, with a relatively firm early track and a relatively flexible later direction."

Item I
Reports of Recent Drilling Legs

[Placed in Agenda between (H) Setting the General Direction , and (J) Detailed Planning for FY92, to allow PCOM members to digest what has been decided, and think of ways to implement detailed planning advice by appropriate DPG or DPGs.]

Leg 127 Japan Sea 1(Ken Pisciotto)

Leg 128 Japan Sea 2 (Kiyoshi Suyehiro)

Leg 129 Old Pacific Crust (Yves Lancelot)

PROGRAMS RANKED THEMATICALLY, APRIL 1990

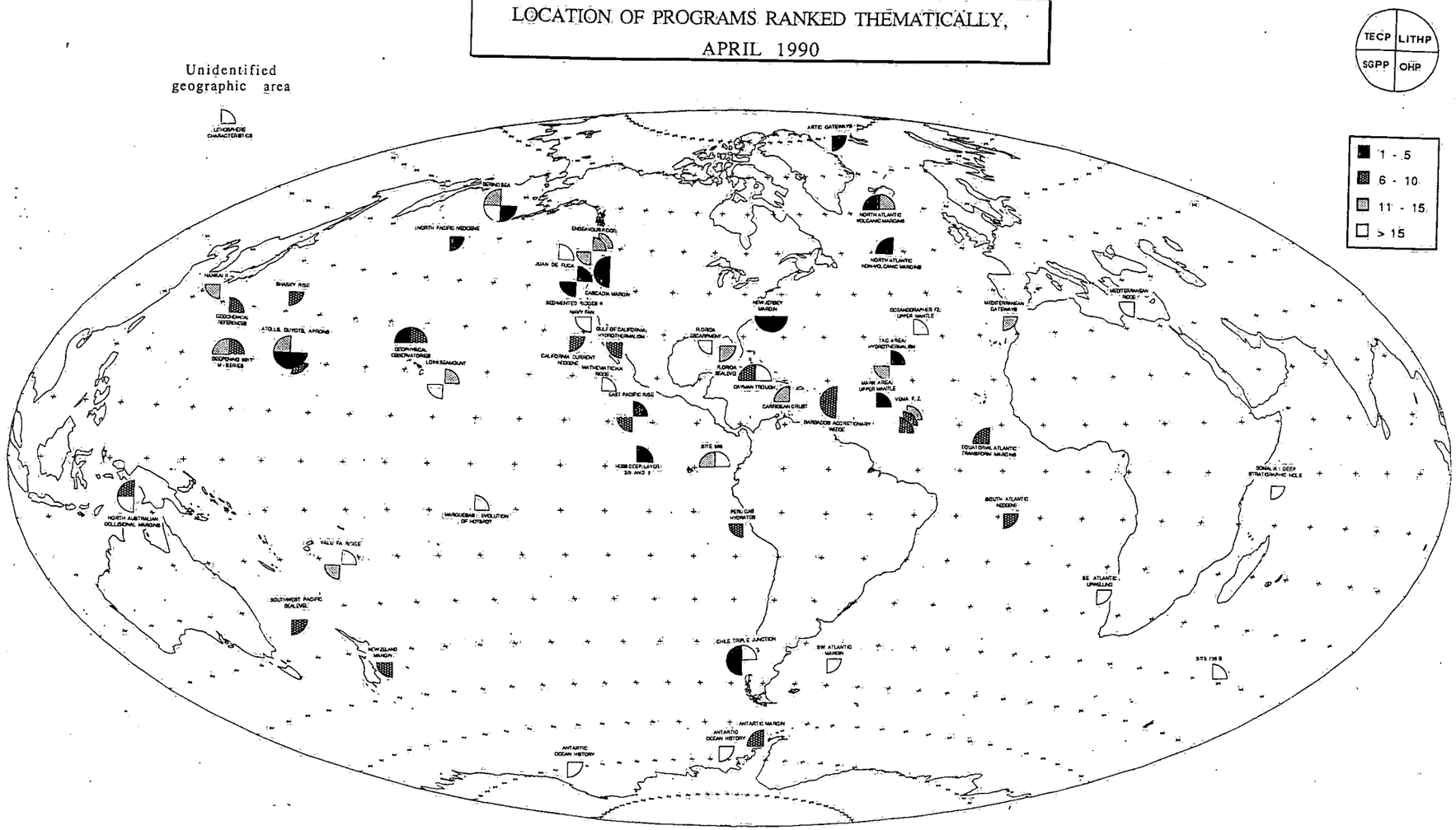
BRIEF TITLE	LITHP	OHP	SGPP	TECP	JOIDES Reference
Antarctic Ocean History, near Ross Sea and Antarctic Pen.		m			-
Antarctic Peninsula Margins (2 legs of 2)				9	297, 351
Atolls, Guyots, & Aprons, W-C Pacific (2 legs of 2)		4 & 6	3	15	203 Rev., 335 Rev.
Barbados Accretionary Wedge (2 legs of 4)			10	6	378 Rev.
Bering Sea (1 leg of 1, from CEPAC-DPG)		5	m	13	CEPAC-DPG
California Current: Neogene		8			271
Carribean Crust (1 leg of 1)				14	343
Cascadia Margin (1 or 2 legs; to be a CM-DPG)			1	3	233, 237, 317
Cayman Trough (1 leg of 1)	24.5			10	333
Chile Triple Junction (2 legs of 2)	24.5		2	1	362 Rev.
Deepening 801C/deep drill. M-series in W.Pac.(1 leg of 1)	9.5			11	368, 287
East Pacific Rise: bare-rock (several legs, from EPR-DPG)	2.5		7		321, 357 Rev.
Endeavour Ridge: hydroth. at medium-spreading ridge	12		12		325
Endeavour Ridge: origin of large metal sulfide deposits	15				325
Equatorial Atlantic Transform Margins (1 leg of 1)				7	313, 346 Rev.
Florida Escarpment			m		332
Geochemical Reference: for subduction zone	9.5				267
Geophysical Observatories: Hawaii pilot project (< 1 leg)	8			4	377 Rev
Gulf of California: hydrothermalism			8		275 Rev.
Hess Deep: layer 2/3 transition and layer 3	1				375
Juan de Fuca: evolution of near-axis seamounts	16				290
Lithosphere Characteristics	19.5				DMP initiative
Loihi Seamount: active young hotspot volcano	14		m		252 Rev.
MARK area: long section of upper mantle	2.5				369
Marquesas: temporal evolution of hotspot	23				291
Mathematician Ridge: extinct ridge	22				352
Mediterranean Gateways		11			323, 372
Mediterranean Ridge			m		330
Nankai-II			13		314
Navy Fan			m		250
New Jersey Margin sealevel		3	5		348
New Zealand Margin (see also SW Pac. sea level below)			9		337
North Atlantic: non-volcanic rifted margins (2 legs of 6)				2	334, 365, 366
North Atlantic: volcanic rifted margins (2 legs of 4)	11			5	310,311,328,358,&363
North Australian collisional margin (2 legs of 2)			m	8	340
North Pacific Neogene and older		2			CEPAC-DPG
Northernmost Atlantic paleoceanography: Arctic gateway		1			305, 336, 320
Oceanographer FZ: long section upper mantle	21				374
Peru: gas hydrates			6		355
Sedimented Ridges II (2nd leg of 2)	5		4		SR-DPG
Shatsky Rise: anoxic events		10			CEPAC-DPG
Site 735B: layer 3-mantle transition	18				300
Site 505: stress measurements (1 to 2 legs of 1 to 2)	19.5			12	373
Somalia: deep stratigraphic hole		m			211
South Atlantic eastern margin upwelling		m			339, 354
South Atlantic western margin ocean history		m			-
South Equatorial Atlantic Neogene		7			347
Southwest Pacific sea level program		9			337, 338, 367
TAG Area: high-temperature hydrothermalism	4		11		361
Valu Fa Ridge: sulfide mineralization in arc environment	17		14		360
Vema FZ: layer2/3 transition	7				376
Vema FZ: long section of layer 3	13				376
Vema FZ: layer 3-mantle transition	6				376
West Florida Margin Sea Level		12			345

m = mentioned for further review and possible higher ranking before April 1991

	LITHP	OHP	SGPP	TECP
1	Hess Deep (multi-leg)	Northernmost Atlantic (2? legs)	Cascadia (1 or 2 legs)	Chile TJ 2 legs
2	tie\ EPR (multi-leg)	North Pacific (1 leg)	Chile TJ (2 legs)	N Atl non-volc marg (multi-leg)
3	tie/ MARK (multi-leg)	New Jersey sea level (1 leg)	Atolls & Guyots (2 legs)	Cascadia (1 or 2 legs)
4	TAG (2 legs)	Mesozoic Guyots (1 leg)	Sed. Ridges (2 legs)	Geophys N of Oahu (part of a leg)
5	Sed Ridges (2 legs)	Bering Sea (1 leg)	New Jersey sea level (one leg)	N Atl volc marg (multi-leg)
6	Vema layer 3/mantle (multi-leg)	Marshall Atolls & G. (1 leg)	Peru Gas hydrates (part of a leg)	Barbados (2 legs)
7	Vema layer 2/3 trans. (multi-leg)	So. Equat. Atlantic Neog. (1? leg)	EPR (multi-leg)	Eq. Atl. Transforms (one leg)
8	Geophys N of Oahu (part of a leg)	California Current (1 leg)	Gulf Calif (one leg)	N Austral collision (2 legs)
9	tie\ Geochem. Ref. (one leg)	SW Pacific sea level (1 or 2 legs)	New Zealand (one leg)	Antarctic (2 legs)
10	tie/ Deepen 801C (one leg)	Shatsky Rise anoxia (part of a leg)	Barbados (multi-leg)	Cayman (one leg)
11	N Atl volcanic margins (multi-leg)	Mediterra'n Gatew'y (1? leg)	TAG (2 legs)	Deep Drilling M ser (one leg)
12	Endeavor hydroth'm (one leg)	West Florida Margin s.l. (1 leg)	Endeavour hydroth. (one leg)	Costa Rica stress (1 or 2 legs)
13	Vema long sect.layer 3 (multi-leg)		Nankai II (one leg)	Bering Sea (one leg)
14	Loihi (one leg)		Valu Fa arc sulfide (one leg)	Caribbean Crust (one leg)
15	Endeavor sulfide (one leg)			Atolls & Guyots (2 legs)
16	Axial Seamount (one leg)			
17	Valu Fa arc sulfide (one leg)	(plus 5 others)	(plus 6 others)	
		Antarctic near Penin.	*Bering Sea*	
18	SW Indian 735B (1 or 2 legs)	*Antarctic near Ross Sea*	*Florida Escarpment*	
		Somalia deep hole	*Loihi*	
19	tie\ Costa R. stress (1 or 2 legs)	*SE Atlantic Upwelling*	*Mediterranean Ridge*	
		SW Atlantic Margin	*Navy Fan*	
20	tie/ DMP charact. (multi-leg)		*N Austral margin*	
21	Oceanographer (multi-leg)			
22	Mathematician (one leg)			
23	Marquesas (one leg)			
24	tie\ Chile TJ (2 legs)			
25	tie/ Cayman (one leg)			

note:
the horizontal lines below ranks 5, 10, and 15 mark the divisions on the illustrations; they have no other significance

LOCATION OF PROGRAMS RANKED THEMATICALLY, APRIL 1990



Programs of interest to more than one thematic panel, Spring 1990

Chile Triple Junction
1 (TECP), 2 (SGPP) (& tie for 24: LITHP)

Cascadia
1 (SGPP), 3 (TECP)

Atolls and Guyots
3 (SGPP), 4 (and 6, OHP) (& 15, TECP)

New Jersey Sea Level
3 (OHP), 5 (SGPP)

Sedimented Ridges
4 (SGPP), 5 (LITHP)

East Pacific Rise Bare-rock
tied for 2 (LITHP), 7 (SGPP)

Geophysical Observatory Pilot Hole
4 (TECP), 8 (LITHP)

TAG Area Hydrothermal
4 (LITHP), 11 (SGPP)

North Atlantic Volcanic Rifted Margins
5 (TECP), 11 (LITHP)

Bering Sea
5 (OHP), 13 (TECP) (& mentioned by SGPP)

Barbados	6 (TECP), 10 (SGPP)
SW Pacific sea level	9 (OHP), 9 (SGPP)
Deepen 801	tie for 9 (LITHP), 11 (TECP)
Endeavor	12 (& 15, LITHP), 12 (SGPP)
N Australia Margin	8 (TECP) (& mentioned, SGPP)
Cayman	10 (TECP), tied for 24 (LITHP)
Site 505 Stress	12 (TECP), tied for 19 (LITHP)
Valu Fa	14 (SGPP), 17 (LITHP)
Loihi	14 (LITHP), (& mentioned SGPP)

Programs of interest only to one panel (through rank 10)

1. Hess Deep (LITHP), Northernmost Atlantic (OHP)
2. North Pacific (OHP), North Atlantic non-volcanic margins (TECP)

2.5 MARK area (LITHP)

6 Vema 3/M (LITHP), Peru Gas Hydrates (SGPP)

7. Vema 2/3 (LITHP), S. Equat Atl. (OHP), Equat. Atl. Tran'fms (TECP)
8. California Current (OHP), Gulf of California (SGPP)
9. Antarctic (TECP)

9.5. Geochemical Reference (LITHP)

10 Shatsky Rise (OHP)

Item J
Preparation for Detailed Planning

To Prepare for FY92 Program Plan

- Establish a DPG (or DPGs?) that is appropriate to prepare a prospectus for scientific drilling in FY92 (to include more than 5 or 6 legs in the general direction of the vessel)
- Name an appropriate chair, then fill and charge that DPG.
- The meeting and report of the DPG must be completed soon so that the report can be reviewed and commented upon by panels at their fall meeting, before the Annual Meeting.

To Prepare for Beyond FY92

- Inform SSP, and assign PCOM watchdogs for:
  - the highest-ranked programs of all panels (top 5? top 10?)
  - all ranked programs in the general direction of the vessel

- In addition to the general DPG needed for the FY92 prospectus, are any more specific DPGs required at this time?

- What, if any, Working Groups are needed at this time?

  - *North Atlantic Rifted Margins*

Should this be (a) only one overall working group, or (b) two working groups, one for volcanic margins ("dipping reflectors") and one for non-volcanic margins, or (c) just one for volcanic rifted margins? In any event, TECP would have the main interest, with OHP and SGPP involved, and with volcanic rifted margins including LITHP.

The joint LITHP-TECP meeting on 6 March 1990 urged PCOM to establish a Volcanic Rifted Margin Working Group at its April meeting. The VRMWG should consist of persons with expertise in passive margin studies as well as such specialists as petrologists. The WG should be formed, charged, and meet before [and probably after] a somewhat broader workshop being proposed by M. Coffin. The joint LITHP-TECP meeting suggested 11 names and a chair. [can J. Austin talk with M. Coffin and bring some details to Paris?]

- Sea Level

Although mainly SGPP and OHP, this working group would involve LITHP and TECP as well. Earlier, PCOM said it approved of the concept of a JOIDES working group to focus generalities on to the actual Ocean Drilling Program, but was awaiting the report of the USSAC El Paso workshop before establishing and charging a working group. OHP and LITHP have nominees.

- Deep Drilling

Await comments and recommendations of C. Sparks. Presumably, TEDCOM, all thematic panels, ODP-TAMU, PCOM, and JOI all have strong interests, if such a working group or work shop is considered to be necessary.

New Detailed Planning Groups and Working Groups

It will be easiest if PCOM approves mandates and slates of members for new DPGs and WGs in a single motion.

0900 Thursday 26 April 1990

Item K
Old Business; Continuing Issues

Strategy for Leg 136 (Engineering 3)

This leg has engendered considerable discussion after the last PCOM meeting.

- At present as in the approved Program Plan, there will be two components in preparation for lithospheric drilling in the eastern equatorial Pacific: (a) an attempt to clear the junk at the bottom of hole 504B so that it can be deepened to layer 3, followed by (b) setting of two hard-rock guidebases on the EPR at sites to be named by the EPR-DPG and approved by PCOM, so that the EPR bare-rock work can progress. Considering earlier recommendations from LITHP, PCOM decided that there would be a minimum of scientific work on what would be essentially an "engineering operations" leg. Considering the transit time, the Science Operator asked that the leg be split in two parts by a Panama port-call.
- Various proposals have suggested that deepening of 504B be (1) by milling followed by coring to layer 3, rather than (2) by whip-stocking and re-drilling the lower part of 504B, or by spudding a new hole near 504B. If a new hole is required, proposals have been: (3) drill close by, so that the upper part can be considered a near-

duplicate to the present TD of 504B, then core deeper, (4) core close by, to and deeper than the present TD of 504B, (5) choose a place in the near vicinity (few km) to core to the top of layer 3, and (6) abandon the 504B area and choose a better place in any ocean for obtaining the layer 2-3 transition and the upper part of layer 3. Each of these 6 options have various pros and cons.

• There have been recent panel requests to extend the time of Leg 136 to allow more coring and logging. The Science Operator has requested that the half-legs be split into two fiscal years, and to have additional engineering tests, especially of the DCS.

• Most recently LITHP has proposed the following:

Engineering Leg 3A at 504B: After reentry, log temperature, sample fluid, and measure permeability; then mill (and fish or both). If the hole is cleared with time remaining, core ahead. If it becomes obvious that clearing will be unsuccessful in the allotted time, the remaining time should be devoted to as full a logging program as possible.

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

Therefore, for both 3A and 3B, there should be a minimum scientific party on board.

• Guided by advice from LITHP, TAMU, and BCOM, PCOM should decide:

-the total time for 3A and 3B

-whether or not to accept LITHP's recommendation from among the 6 options; if not, which one?

-if there should be an alternative to the full logging program if it becomes obvious that 504B cannot be milled clean. For example, if the hole is lost by collapsed casing or extensive bridging well above bottom, might there be re-APC of a nearby site, or early arrival at Panama?

-whether 3B should follow 3A at once or after a few legs

-whether or not the LITHP recommendations for 3B are accepted; if not, what?

Publications

Based on advice from IHP, OHP, and TAMU, PCOM should decide on possible changes in publications policy with regards to these hold-over and new issues:

- Leg synthesis chapters
- Review Boards
- Deadlines for the remaining pre-Leg 125 volumes

Thematic Summaries

- Status of Indian Ocean activities (R. Duncan)
- Status of Western Pacific activities

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

JOIDES Advisory Structure

The following topics show the range of recent criticism of the existing structure and policy of the program. They appear to be as important in some minds as the topic of outside membership on EXCOM and PCOM. PCOM should know of these, but also should decide if any need any action.

- Adequacy of current review procedures, including outside reviews of novel proposals; concept of maturity meaning multi-channel seismic lines

  K. Hsü correspondence

- Importance of program, both absolute, and relative to other earth-science initiatives.

  R. Coleman correspondence

- Economic or applied aspects

  D. Sangster letter

- Co-chief selection and responsibilities; cruise prospectus

  R. Larson and Y. Lancelot letters

  R. Wilkens letter

- Select best area; return until problem is solved

  P. Robinson letter

Representation on PCOM by non-JOIDES Institutions

- How do we wrap up this issue?

Evaluation of ODP drilling results in terms of COSOD I objectives.
JOIDES Office has received responses from 39% of the co-chiefs, leading to revisions and additions to the table that EXCOM asked JOIDES Office to provide. Responses come in every week or so. There is a wide range in the degree of detail of the responses. We will provide a new table for the August PCOM meeting whether or not all co-chiefs have responded.

Identification of action items following discussions.

Item L
Membership and Personnel Actions

Panels and Panel Chairs
(See separate sheets; overhead projections will be used at the meeting)

PCOM membership and liaison work.

- In light of recent changes and probable ones of the near future, should Art Maxwell, as incoming EXCOM Chairman, be prepared to write to EXCOM suggesting fields that will need strengthening?
- As for panel meetings before PCOM's August meeting, we will require liaison to PPSP (12-13 June, Iceland, Moberly) DMP (28-29 June, Seattle, Cowan), SSP (? July, Lamont, ?), Cascadia DPG (summer), and any new DPG for FY92 (summer).
- Any general change of PCOM liaison responsibilities (see table)?

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

PCOM Liaisons to DPGs

M. Leinen & R. Moberly	CEPAC
J. Natland	EPRDPG
???	CAPDPG

Liaison to Global Earth-science Programs

- Global Sedimentary Geology Program (GSGP)

T. Bralower (co-chair) and J. McKenzie (member) accepted appointment as JOIDES representatives

- Federal Digital Seismic Networks (FDSN)

A member of a JOIDES thematic panel, who was discussed in PCOM but not appointed because of no response yet from FDSN, was appointed by PCOM chair as "acting co-chairman" after the response was received. In that way we could meet a deadline for an annual FDSN meeting and also take advantage of travel costs. PCOM may wish to confirm this person as one of the two JOIDES representatives; PCOM should at any rate appoint a co-chair and member.

- Nansen Arctic Drilling Program (NAD)

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

- International Geosphere and Biosphere Program (IGBP)

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

- RIDGE, FRIDGE, BRIDGE

We await formalization of an international program. T. Pyle wrote J. Delaney in September 1989 asking to be informed when some international effort is formalized. LITHP prepared a list of nominees last fall.

Co-Chief Scientists

Except for Leg 136 (Engineering 3a and 3b), PCOM has given its recommendations for co-chief scientists through Leg 139. If we have now settled the objectives and strategy for Leg 136, PCOM can recommend a co-chief scientist for both parts. Perhaps TAMU has appointed co-chief scientists for leg 139.

If the "general direction of the vessel" is fairly obvious after our Wednesday decisions, we may want to nominate co-chief scientists for a couple of additional legs. Or, that can be delayed until August but preferably not to November.

Acceptance of slates of members
It will be easiest if PCOM incorporates all personnel changes in a single motion.

Item M
New Business

Panel Chairs
Questions have arisen with regard to panel chair efforts regarding
- Time
- Costs

Solicitation of endorsements
- Place GPS station on Sabine Bank

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

Also this item to include action items that may have been postponed from earlier parts of the meeting.
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Item N
Future Meetings

14-16 August 1990; La Jolla, California. Scripps Institution of Oceanography will host our summer meeting.

28 November-1 December 1990, Kailua-Kona, Hawaii. Hawaii Institute of Geophysics will host the Annual Meeting. Probably it will be at the Hotel King Kamehameha. The PCOM meeting will be preceded by the Panel Chairmen's meeting on Tuesday 27 November. A field trip is possible if there is sufficient interest. Should it be before or after the meeting?

23-25 April 1991, Austin, Texas. University of Texas Institute for Geophysics will host our spring meeting at the Thompson Conference Center on the University of Texas campus.

20-22 August 1991, Hannover, Federal Republic of Germany. Bundesanstalt für Geowissenschaften und Rohstoffe will host our summer meeting in Hannover. There will be a field trip after the meeting.

4-7 December 1991. The 1991 Annual Meeting will be hosted by the Graduate School of Oceanography. The PCOM meeting will be preceded by the Panel Chairmen's meeting on Tuesday 3 December.

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

PCOM should determine the venue and date of its spring 1992 meeting.

Item O
Adjournment

JOIDES PLANNING COMMITTEE ANNUAL MEETING
27-30 November 1989
Woods Hole Oceanographic Institution
Woods Hole, Massachusetts

REVISED DRAFT MINUTES

Members:

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

Liaisons:

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

Panel, Committee and DPG Chairmen:

M. Ball - Pollution Prevention & Safety Panel
R. Batiza - Lithosphere Panel
I. Dalziel - Tectonics Panel
R. Detrick - Sedimented Ridges DPG
R. Kidd - Site Survey Panel
T. Moore - Information Handling Panel
K. Moran - Shipboard Measurements Panel
D. Rea - Central & Eastern Pacific DPG
N. Shackleton - Ocean History Panel
C. Sparks - Technology & Engineering Development Committee
E. Suess - Sedimentary and Geochemical Processes Panel
P. Worthington - Downhole Measurements Panel

Guests and Observers:

J. Baker - Joint Oceanographic Institutions, Inc.
B. Harding - ODP-TAMU Engineering
A. Meyer - Science Operator (ODP-TAMU)
J. Natland - Scripps Institution of Oceanography
M. Storms - ODP-TAMU Engineering

JOIDES Planning Office:

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

Monday, 27 November 1989

812 Introduction

PCOM Chairman Ralph Moberly called the 1989 Annual Meeting of the JOIDES Planning Committee to order. Brian Tucholke welcomed everyone to the Woods Hole Oceanographic Institution. Tucholke explained logistics including two dinners, the first hosted by Woods Hole and the second by JOI. Moberly welcomed the alternates standing-in for this meeting, A. Crawford, C. Mevel and J. Weissel. Introductions were then made starting with the JOIDES Planning Office, PCOM members, panel chairmen, liaisons, invited guests and observers.

813 Minutes of 22-24 August 1989 Seattle PCOM Meeting

Moberly called for comments, corrections and approval of the previous minutes.

U. von Rad asked that on page 8, Bochum be corrected to Bosum.

PCOM Motion

PCOM approves the minutes of the 22-24 August 1989 Planning Committee meeting with amendments. (Motion Kastner, second Brass)
Vote: for 16; against 0; abstain 0

814 Approval of Agenda

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

PCOM Motion

PCOM adopts the agenda for the 27-30 November 1989 Planning Committee meeting with amendments. (Motion Brass, second Leinen)
Vote: for 16; against 0; abstain 0

815 ODP Reports By Liaisons to PCOM

EXCOM

R. Moberly reported on the 3-4 October 1989 EXCOM Meeting in Amsterdam. Summaries of the principal results of importance to PCOM included:

• Conferences. PCOM's mandate calls for sponsoring and convening COSOD-type conferences at appropriate intervals. One plan had called for COSOD III in mid-1992. After discussion, EXCOM leaned toward both (a) a small series of international science-focused meetings in the summer or fall of 1991, partly retrospective ('distinguished past') and partly forward-looking ('exciting future'), with timing, venues, and organization largely decided by the country or countries for which these will be partly 'marketing exercises' for MOU renewal; and (b) COSOD III in perhaps 1993, with a focus on means of implementation of plans in the renewed program.

• Mandate changes. EXCOM accepted, and the JOI Board of Governors ratified, the changes PCOM proposed for panel membership statements and reinstitution of working groups.

• Global geoscience initiatives. EXCOM accepted the JOI proposal (which PCOM had endorsed) of formal initiatives with international advisory bodies of large global geoscience programs. There were, however, considerable reservations about the direct contact once a year between the liaison groups and PCOM, because of the possibility of short-circuiting the JOIDES advisory panel structures. That reservation also led to the proviso that PCOM and EXCOM members shall not be members of the liaison groups.

• Budget Committee. J. Austin of PCOM was appointed to BCOM.

• Data Dissemination. PCOM is to recommend to JOI any action about dissemination of ODP data, including action concerning the group that prepared the CD-ROM of DSDP data.

• Future Structure of PCOM. The PCOM resolution about non-JOI membership on PCOM was passed from EXCOM to the JOI Board of Governors. Supposedly, the BOG will decide their course of action at their late winter meeting. Letters from persons in non-JOI institutions, received in answer to the PCOM inquiry, were attached to the Agenda book and additional letters were distributed at the meeting.

• Future Structure of ODP. EXCOM will assist JOI in setting up and charging the next (third) Performance Evaluation Committee (PEC). The review is to include the broader structural aspects of the program as well as the performance of the subcontractors. EXCOM will advise JOI regarding procedures to select the post-1992 subcontractors.

• Miscellaneous. In a discussion related to performance evaluation, PCOM was cautioned that the JOIDES advisory panels must be independent; they must not become unduly influenced by organizations they are to monitor or evaluate. In a discussion of the Long Range Plan, comments were made about the Executive Summary, and the statement about a possible second vessel; JOI is to work the comments into a consensus statement. EXCOM reviewed ODP results in terms of COSOD I objectives. PCOM's motion that TAMU shall develop the capability to run the BRG's suite of logging tools at sites drilled with the DCS, led to discussion of the budgetary and time-delay implications of some of the possible methods.

Discussion

Duncan asked how the tables from the EXCOM agenda book concerning ODP results in terms of COSOD I objectives was prepared. Moberly said that the goals of the legs came from the cruise prospectus and were matched against COSOD I statements; the results came from the cruise reports. Duncan suggested that the document could be used more formally if it were prepared with the help of the Co-Chief Scientists and JOIDES panels. Kidd said that the document could be especially valuable outside the ODP community if it were prepared in a more formal manner. Moberly said that it must be remembered that the document was prepared quickly and intended only for the use of EXCOM in evaluating how well COSOD I goals had been attacked. von Rad said that there are some mistakes in the list and it needs to be checked by the Co-Chiefs and thematic panels. Cita cautioned that more subjective input might distort the picture about what has truly been accomplished. Brass was concerned that the document as it now stands should not be widely disseminated for PR purposes. Kastner said that PCOM needs to know what has not been accomplished because of technological problems. Shackleton said that the accomplishments cannot be evaluated solely on the basis of what comes off the ship; post-cruise laboratory work also needs to be taken into account. Leinen thought that it was naive to think that this document would not go beyond EXCOM, PCOM and JOIDES panels; because it is a valuable document it needs to have more input from panels before it gets wide distribution. It was the consensus of PCOM that letters go out to Co-Chief Scientists asking them to evaluate their legs in terms of COSOD I themes and if the objectives in the cruise prospectus were achieved in full, in part, or not at all. This evaluation is to take into account the results of the post-cruise science. The JOIDES Office with input from the Co-Chiefs and the thematic panels will revise this document. PCOM members should also submit any corrections that they have.

NSF

B. Malfait reported that the FY90 budget for NSF is still unknown. The Foundation is planning on a modest increase. The FY90 ODP budget has

preliminary approval at $37.7 M, with final approval at $38 M expected in January pending JOI resolution of some differences with TAMU. The contribution by the international partners will be $16.5 M ($2.75 M per partner) for FY90. The original NSF target for FY91 is $39M. BCOM estimates are $40M, with support for technological development a major concern. The final target will probably lie somewhere between $39 and $40 M.

Potential new members for ODP are being pursued. There will be a re-examination concerning Soviet participation. There is preliminary interest from the International Oceanographic Commission (IOC) about developing a consortium of developing countries. There may be more to report on this at the April PCOM meeting.

There is strong support within NSF for continuation of ODP after 1993. MOU discussions have begun with international partners with the same timetable as presented at the Seattle PCOM. The Long Range Plan will be an important document for discussions about renewal and is anticipated to be published in early 1990. Issues related to plans for the program after 1993 include: Access to additional capabilities (shallow-water and atoll drilling, additional sediment-coring capabilities, Arctic coring); Interaction with other programs; Tool and instrument development; Long term experiments and occupation of drill sites.

NSF Science Program support of ODP-related field programs for 1990 are: 1) Miller/Christie-Blick MCS survey with the *Bernier* of the US Mid-Atlantic Margin; 2) Overpeck/Arthur coring and seismic study of the Curiaco Trench using the *Thomas Washington*; 3) Delaney/Spiess study using Deep Tow and dredging of the Kane Transform using the *Melville*,possibly in early 1991; 4) Purdy/Fryer near bottom refraction experiment on the East Pacific Rise possibly in early 1991. The 1991 Field Program will accept proposals for projects in any ocean, using the PCOM 4-year plan for evaluation. Proposals are due either 1 February or 1 June 1990.

Discussion

Kastner asked about plans for the NEREIS project. Mevel distributed a circular about the NEREIS European Workshop planned for 29-30 January 1990 in Brussels. Mevel said that around 80 scientists will be participating in this workshop. von Rad said that the FRG does not foresee having funds to participate in both ODP and NEREIS.

von Rad then discussed the problems being caused for the non-US partners by the exclusion of the Soviets from ODP. He said that the letter from J. Thiede suggests that time is becoming a pressing matter, since the Soviets have the money available at this time, but may not, if the decision continues to be put off. The Europeans are concerned that they keep hearing the message that something is in the works, but nothing substantial has been done. von Rad

asked that PCOM make an endorsement for further Soviet participation in ODP. Von Rad said that other European programs are being hurt by the decision to exclude the Soviets from ODP, for example Thiede's work in the Arctic. Brass said that permission for the *Polarstern* to work in Soviet territorial seas has also been affected by this decision. The international partners are involved in this decision. von Rad and Brass volunteered to prepare a resolution for PCOM approval (see Minute 826).

Taira asked if the Koreans were being approached about participating in the International Oceanographic Commission consortium. Malfait said that it is unclear at this time how the IOC is proceeding with developing a consortium, but more information should be coming soon. Garrison said that the Koreans had expressed a strong interest in forming an East Asia Consortium to P. Rabinowitz during his visit.

JOI

E. Kappel reported that FY89 is being closed out at JOI. Approval of the full $38M ODP budget level for FY90 has been pending resolution of questions about TAMRF administrative fees and ODP/TAMU salaries. JOI has not received an official target budget from NSF for ODP for FY91. JOI is concerned that a $39M budget will cause problems with technological development and may not cover increases in the PPI.

The Long Range Plan is being worked on at JOI, where it is in the final editing stages. An executive summary has been completed and reviewed by EXCOM. Bids have been received from printers. Distribution is anticipated to be around February. The method of distribution is not certain, perhaps something similar to what was done for COSOD.

JOI has a formal response from Bob Ginsburg of the Global Sedimentary Geology Program agreeing to form a liaison group. Ginsburg has forwarded the names of three GSGP representatives for this liaison group. PCOM needs to nominate members for this group (see later Minute 828). T. Pyle has briefed the RIDGE Steering Committee about the liaison groups and a formal response is expected shortly. The new chairman of FDSN, Adam Dziewonski, has been briefed by Pyle and a response is expected soon. A positive response is also anticipated from the Nansen Arctic Drilling group. The Continental Science Drilling Program has not yet been sent a formal letter, but the recent ODP/CSDP high-temperature tools workshop provided an opportunity to explore ways with which to interact with them. JOI has also been talking to NSF Earth Sciences Division about their MOU with KTB, which could provide a tie in between ODP and KTB.

A RFP for Micropaleo Reference Centers has been distributed by JOI. Announcements have been sent to all ODP member countries. Deadline for

proposal submission to JOI is January 15, 1990. Money for these centers is not in the budget as it stands now.

J. Weissel is the new chairman of USSAC. The CD-ROM which was funded by USSAC has been distributed to PCOM members. A new Fellowship brochure has been prepared and copies were distributed at the meeting. USSSP has funded F. Spiess for a wireline reentry project. USSAC is supporting the upcoming Geochemical Logging Workshop of Brass and Kastner.

Discussion

Leinen asked if there had been a response from JGOFS about the liaison groups. Kappel said that Pyle has written IGBP, but there has been no response at this time.

N. Shackleton said that he is involved in the IGBP and will talk to them about responding to JOI.

Science Operator

L. Garrison reported on the Sea of Japan Legs which were completed in mid-October (Appendix A). These appear to have been successful legs, with the major objectives achieved. On Leg 127, the age and nature of the acoustic basement was determined at 3 of 4 sites. Ages for the dolerite sills cored at these sites range from 14-19 m.y. The site on the Okushiri Ridge did not reach basement because of loose sands, but, dating of the sands suggests convergence of the plates began at 1.8 m.y. At Site 794 on Leg 127, the drill pipe became stuck and could not be jarred loose. The pipe was backed off and the tools left in the hole. The cased hole into basement for subsequent experiments on Leg 128 was not achieved. Therefore, 10 days were added to Leg 128 to either fish the tools out of the hole or to drill a new hole for these experiments. Leg 128 started drilling at Site 798 on the Oki Ridge, where at a total depth of 518 m a show of gas caused drilling to be terminated for safety reasons. This site was where the third-party, ^{14}C-labelling, bacteriological experiment by scientists from the UK was planned. The cores for this experiment were transferred to another vessel chartered by the UK, transported to shore and flown to the UK. The samples appear to have arrived in good condition and the results are now being worked up. Site 799 drilled 1084 m in the failed rift in the Yamato Trough, where metallogenic deposits were expected. A sharp decrease in the C_1/C_2 ratios near the bottom of the hole and fluorescence of the fluid caused drilling to be stopped for safety reasons. The hole is good for lower Miocene paleoceanography. The experiments at Site 794 depended on a rendezvous with ORI ships, therefore the site was reoccupied. Fishing was not successful, therefore a second hole with a reentry cone offset 167 m from the first, was drilled at least 80 meters into true basement, and the hole was then cased. The OBS experiment was

successfully conducted at this site. For the electrical resistivity experiment another uncored, uncased, 400-m-deep hole was quickly drilled. This experiment also appears to have been successful.

Following Leg 128, the *Resolution* went into Pusan, Korea for a quick offloading and change of crew. The ship then transited to Singapore, where along the way they had to deal with two medical evacuations and a typhoon. The ship arrived in Singapore on time and the dry-dock was carried out. During the transit from Singapore to Guam the ship encountered another typhoon through the center of which it safely passed. While at anchor in Guam, new drill pipe was made up. The ship departed Guam one day early on November 22 and that extra day has been added to Leg 129.

At the last meeting of PPSP, several of the sites for Leg 129 were left unreviewed since new data for these sites was forthcoming. PPSP has given latitude to drill along any of the seismic tracks (Appendix A), since no safety problems are anticipated in 6000 m of water and 300-400 m of sediments. Leg 129 is underway and has begun drilling at PIG-1.

Current plans for drilling on Leg 130 are to drill the holes in the order OJP-4, OJP-3, OJP-2, OJP-1 and OJP-5, with 10 meters of basement penetration at OJP-4 and 50 meters of basement penetration at OJP-5 (Appendix A). This will allow some work to begin on basement samples early in the cruise without endangering the Neogene Transect.

There have been no changes for Leg 131. At the last PCOM meeting there was a discussion about running the wireline packer in perforated casing. Further consideration has shown this to be useless for getting samples of fluids for scientific purposes. The sole purpose of this test will be to check the operation of the wireline packer. There will be two other packers available for running outside of the pipe. The Geoprops probe will probably not be ready. The Navi-drill can be used to make a hole for probes in advance of the drill bit.

L. Garrison distributed an updated operations schedule (Appendix A). Engineering Leg 132 has had 4 days added so that it is now 59 days. The transit from Guam to Port Moresby has been eliminated and has the effect of increasing Leg 133 by 6 days, but saving transit time. The length of Leg 134 remains unchanged, but the port dates are advance one day. The port for the end of Leg 135 is probably Papeete.

Personnel changes at ODP-TAMU include the move of Sylvia DeVoge to the UK and her replacement as Administrator by Rick McPherson. Ray Silk has retired as chief production editor and his experience will be missed. Ray has served DSDP and ODP for 17 years.

B. Harding reported on the drydocking of the *Resolution*. Both the SEDCO projects and the ODP-TAMU projects went well and was within the budget.

The ship was one day late going off the blocks and back into the water, but did not effect the overall schedule. The underway geophysics lab was rearranged and modified; it had the floor raised and more space was made available by rearranging the racks. It got a separate air conditioning system to compensate for being over the engine room. The sonar dome was removed and the 12 separate 3.5 kHz transducers were replaced by a single 3.5 kHz transducer. A motor-generator set for standby power was added to provide more reliable, regulated power. New lab furniture was added to the lab deck. New counter tops and stainless steel coving were put into the core splitting room. A new air conditioning unit was put in the computer-user room which also freed up a little space. The floors on the lab deck were regraded to provide better drainage. A new rub-rail was put on the moon pool for better protection for the TV cable. A new doppler sonar unit was installed. The Lamont BRG removed the Schlumberger CSU unit and overhauled it, and rearranged racks in the downhole measurements lab. The hull was found to be in good shape and clean. Some hull plates were replaced in the starboard aft thruster well. This was only the second drydock for the vessel. The rules provide for a dry dock every 4 years unless there is an underwater inspection. The next drydock will probably come up in 1994.

A. Meyer reported on staffing and publications. The science staffing is almost complete through the NE Australia Leg 133. Two scientists are needed on the Engineering Leg 132. Five scientists are needed on NE Australia Leg 133 and ODP-TAMU is looking to the non-US partners to fill these slots. Legs 134 and 135 should be staffed by Christmas. Meyer discused the shipboard participant tally for Legs 101 to 128 (Appendix A). Prospectuses have been published for Legs 129, 130, 131 and 132 plus an addendum to Leg 129 based on the results of the *Suroit* cruise. Sites for NE Australia Leg 133 will be reviewed at the February meeting of PPSP and the Co-Chief pre-cruise meeting will be in early March. The pre-cruise meetings for the Vanuatu and Lau Legs will also happen prior to the next PCOM meeting and if there are to be liaisons to these three meetings they should be appointed now. There is a new staff scientist, John Firth a nannofossil paleontologist, who will be sailing on the Nankai Leg. A vacant staff scientist position will be advertised in January.

Publications were discussed next. Currently there are two post-cruise meetings, an initial meeting and the scientific meeting. Legs 125 and 126 have had their initial meetings and Legs 127 and 128 have scheduled initial meetings in January 1990. Normally 6 people have been attending these meetings which are about 4 months after the cruise. The scientific post-cruise meeting at about 12 months are being requested for venues other than College Station: Leg 125 in Menlo Park; Leg 126 in Hawaii; Legs 127 and 128 jointly in Japan. In some cases field trips are being requested to be held along with the meeting. E. Kappel said that JOI has budgeted assuming the meetings are held in College Station. JOI is willing to try the system of meeting elsewhere but the expenses have to stay within the budget. The

policy on field trips is the same as for PCOM and other JOIDES meetings, it is permissible to hold them, but USSAC cannot pay for them. USSAC will consider this question further at their January meeting.

Meyer showed the scheduled distribution dates for publications of Initial Reports and Scientific Results (Appendix A). Publication of the Part A Initial Reports volumes 12-13 months after the cruise should be accomplished next year. An experiment is being tried on Leg 129 by sailing an illustrator on the cruise to help draft the barrel sheets onboard. It is anticipated that the barrel sheets and some illustrations will be finished when they come off the ship. The editorial review boards and the overall review process results in less control over speeding up publication of the "Scientific Results" volumes. The goal is to have the publication of these volumes at 38-40 months post-cruise sometime soon and to approach the 30-32 month goal in the next few years.

Discussion

Kastner wanted to know what is being done about automation of the barrel sheet preparation. Meyer said that ODP is rethinking what the barrel sheets are supposed to accomplish. Use of computers to speed up the process are also being worked on and TAMU suggestions will be reviewed by SMP and IHP. Moore complimented Meyer/ODP/SMP for their quick action to help speed up publications. Moore asked how the possible addition of another partner and additional persons such as the illustrator would effect the number of berths available. Meyer said this is a complex problem, it not only effects the number of bunks needed but also how to manage the large number of persons onboard. This issue may require changes in the staffing policies. Weissel asked about the change in the number of applications by persons from non-JOI institutions. Meyer said that there appears to be a general increase in the number of applications from persons from non-JOI institutions since Leg 118. Moore commented that there is often a remarkable naivete by some shipboard scientists about marine geology and sedimentation. He suggested that a short course be offered before a leg for shipboard participants. Brass said that this should be done just after leaving port. Cowan suggested that there is no better short course than participation with the science done onboard the vessel. Kastner said that it is the responsibility of the Co-Chiefs to present the goals of the cruise at the start. Mevel asked about participation by graduate students. Meyer said that the average has been about 20% of the shipboard science party being graduate students close to finishing their degrees.

Wireline Logging Services

R. Jarrard presented the Wireline Logging Services report for the Lamont Borehole Research Group. He distributed a prospectus for Downhole Measurements for Year 1 of CEPAC. He discussed logging results from Legs

127 and 128 in the Japan Sea (Appendix B). The generally poor hole conditions on Leg 127 caused problems for logging. The SES was used at only one site on Leg 127 because of the danger of losing the BHA. The new SES design would have allowed more deployments of logging tools. On Leg 128, better hole conditions were encountered and multiple strings of tools could be deployed. The FMS was used in 7 of 9 logged holes and is proving to be a popular logging tool. At site 799B the FMS records reveal cumulate layering in basalts. The FMS has also proved useful in soft sediments for correlations between cores and estimating core recovery. Third-party downhole experiments were successfully carried out as part of Leg 128. Logging has been useful in defining diagenetic features such as dolomite stringers and the opal A/opal CT and opal CT/quartz transitions as well as indicating sediment interbeds between basalt flows and sills. Current plans are to use the geochemical logs and XRF data on cores from Site 798 to do a further evaluation of geochemical logging techniques after improvements such as the introduction of the boron sleeve. The geochemical logs can be used to establish a 41,000-year periodicity and with reprocessing may show a 23,000-year periodicity.

Discussion

Shackleton wanted to know if FMS can be used in real time to evaluate time series studies and core recovery rates during drilling. Jarrard said that the raw data from the FMS can be used to evaluate core recovery with the HPC, but since logging is done after drilling is completed, the FMS data is not usually available during the actual drilling. The processing of the logging data for time series work is too time consuming to be done onboard the vessel.

von Rad commented that Bosum has been funded to develop a gyro-oriented, three axis magnetometer for vertical magnetic field susceptibility measurements in a borehole. This tool could be used for 504B, Chile Triple Junction or Sedimented Ridges. Jarrard said that this is good news for the logging program since the magnetometer that the BRG uses is not gyro-oriented and was going to be removed from use since there are no back-up parts.

816 Annual Reports By Service Panels

DMP

P. Worthington presented the annual report for the Downhole Measurements Panel. During 1988, DMP worked towards the goal of making the ODP community aware of the scientific benefits of logging. During 1989, DMP focussed on improving the quality of logging data. During 1990, DMP will continue with efforts to improve data quality; will propose a downhole measurements program to characterize oceanic lithosphere; work towards high-temperature (slimhole) technology; and contribute to the overall profile

of ODP. DMP would like to see FMS data available on board ship at the earliest possible time, since FMS images are important for orienting and positioning cores and indicating gaps in recovery. The feasibility of processing FMS images while on board needs to established.

DMP is concerned about the fast-approaching need for high-temperature slimhole logging tools in mid-1991. DMP thinks that the highest priority logging measurements established by LITHP should be divided between the BRG at Lamont (temperature, borehole fluid resistivity, formation resistivity, natural gamma, and sonic) and TAMU (permeability, pore pressure, pore fluid sampling). DMP suggests a short-term strategy of repackaging existing tools, but there are anticipated problems because of the 4-inch hole diameter and problems cooling tools at 350-400°C in small holes. DMP recommends that tests be conducted on the upcoming Engineering II Leg to see what kinds of problems will be encountered for logging tools in the 4-inch diameter hole. DMP recommends the immediate commitment of funds to solving these problems.

Discussion

Suess asked if DMP would include the use of downhole fluid tracers as part of their proposed downhole measurements program to characterize oceanic lithosphere. Worthington said that this could be included, but DMP was mainly concerned with establishing the representability of crust at one location. Brass asked what was being done by ODP to tie in core samples to logging measurements. Worthington said that very little is being done with cross-scale tie-in from cores and logs. Brass asked if DMP had any suggestions for initiating these kinds of studies. Worthington said that the physical separation of the ODP repositories for cores and logs makes this sort of study difficult. Kastner suggested that DMP also have joint meetings with SGPP and OHP.

IHP

T. Moore presented the annual report for the Information Handling Panel. IHP deals with many tasks, although publications has received most of their attention over the past year. Other areas that have been dealt with by IHP include: cuts in funds for the Repository have slowed sample distribution; IHP has recommended that the Software Development group add a shipboard systems manager; IHP has commended the Data Base Group for their efforts in keeping the data base updated but are concerned with the amount of work needed to enter the visual core description and that some of the quantitative data appearing in the "Scientific Results" volumes does not get put in the data base; IHP recommends that the ODP Data Base be placed on CD-ROM with the help of the expertise at NGDC.

During the past year IHP, conducted a survey of ODP participants and panel members concerning publications and forwarded the results to PCOM. IHP recommends several changes to the publications policy approved by PCOM; namely clearly spelling out the duties of the authors in regards to informing editors of outside journals how their manuscripts are being treated within the ODP system, and in obtaining proper waivers of copyrights or permissions to publish as reprints in the "Scientific Results" volumes. IHP recommended wording for the ODP Publications Policy is given in Appendix C.

Moore presented the proposed publication schedules for "Initial Reports" and "Scientific Results" volumes (Appendix C). ODP is striving to achieve the mandated target of 12 months post-cruise for the "Initial Reports" volumes and 30 months post-cruise for the "Scientific Results" volumes. For the "Scientific Results" volumes this means that the scientific research and writing of the results must be accomplished within 18 months and may result in a reduction in the amount of research included in these volumes. The tightening of the schedule should result in publication of "Scientific Results" volumes 33-36 months post-cruise by FY93. The loss of critical manuscripts to the "Scientific Results" volumes due to late submission has incurred the wrath of some Co-Chief Scientists.

IHP has made some recommendations to help speed publications: 1) Get samples to investigators as quickly as possible by shipping cores at the end of every leg (Cost ~ $60K); 2) Make editorial decisions as rapidly as possible by enhancing ODP publications staff and returning the function of editorial management of the "Scientific Results" volumes to ODP management (Cost ~$180K); 3) Enhance the drafting staff at ODP-TAMU for drafting barrel sheets in time for 12 month post-cruise production of the "Initial Reports" volumes (Cost ~ $24K). If editorial control is returned to ODP-TAMU, IHP recommends that the Editorial Review Boards have their responsibilities reduced to that of reviewing reviews (i.e. decide on accepting or rejecting) and possibly reviewing synthesis papers.

Discussion

Brass was concerned that DSDP post-cruise data and data from publications outside of ODP was not put into the data base or on the CD-ROM. Brass suggested that a survey needs to be made about what data should be included and a recommendation to include these data needs to be made by PCOM. Moore said that IHP felt that this was not an ODP problem. Brass said that it is important to preserve these data in a useable way. Shackleton asked if the data in tables in manuscripts submitted on computer disks could be read directly into the data base. Meyer said that this is done when possible, but not all authors are submitting their data in this manner. Moberly suggested that the panel chairmen be approached about what post-cruise data should be included and that this matter be placed on the agenda for the next panel

chairmen meeting. Moore said that IHP will be making some further recommendations. The matter was tabled until IHP does more work on this.

Since the size of the present ODP data base is close to filling up a CD-ROM, PCOM discussed the initiative to place the ODP data on a CD-ROM while NGDC still has the group that developed the software for producing the DSDP CD-ROM. The cost was estimated to be approximately $50-80K.

PCOM Motion

PCOM forwards a favorable response to JOI to continue with the development of a CD-ROM containing the ODP data base. (Motion Brass, second Leinen)

Vote: for 16; against 0; abstain 0

PCOM thanks JOI and in particular Ellen Kappel for their efforts towards making the DSDP data available on CD-ROM.

PCOM approved by acclimation the resolution of IHP thanking Ray Silk for his efforts on behalf of ODP.

PCOM discussed the response to the new publication policy. The problems associated with parallel submission of similar papers close to the deadline was a concern. Moore said that it is the responsibility of the authors of these papers to make it clear that the paper is going to be published in ODP, and to not do anything underhanded. Leinen said that the present policy does what PCOM intended, it gets the results published outside of ODP more quickly and speeds up publication of the ODP volumes. Kastner questioned the scientific benefits of publications within 30 months as opposed to 36 months. Brass said that the intention was to get things out quicker and 30 months seems a reasonable time to aim for publication of results. von Rad said that the synthesis papers are very important to these volumes, but the Co-Chiefs have many responsibilities and get only 3 months to write the synthesis. Some flexibility is needed to ensure that the syntheses get included, possibly allowing submission during the paste-up stage. Meyer said that the pagination of the volumes cannot be delayed beyond a certain point without stopping publication. These concerns led to the motion shown below. During the discussion about the motion these points were made. Tucholke said that all of this was discussed in Oslo and there are no new arguments made that should cause PCOM to relax the publications schedule adopted. Watkins also endorsed the 30 month post-cruise publication schedule as a goal, but said TAMU needs to be given some leeway to make the process work. PCOM should avoid micromanagement. Cowan said that the shipboard participants need to face up to their responsibilities and submit their manuscripts within 16 to 18 months as required in the present schedule.

PCOM Motion

PCOM will keep the time-frame previously approved for the "Initial Reports" volumes, but move the post-cruise scientific meeting to 14-16 months and endorse publication of the "Scientific Results" volumes within 36 months post-cruise. (Motion Kastner, second Mevel)

Vote: for 3; against 13; abstain 0 **(Failed)**

PPSP

M. Ball presented the annual report for the Pollution Prevention and Safety Panel. During 1989 PPSP reviewed proposed sites for: Legs 127 and 128 in the Sea of Japan; Leg 129, Old Pacific Crust; Leg 130, Ontong Java Plateau; and Leg 131, Nankai Trough. 25 drill sites were approved of which 5 were moved to avoid structurally high positions. During 1989, PPSP reviewed all oil shows and source rocks encountered in DSDP and ODP drilling. The oil show in cap rock recovered off Challenger Knoll, a salt dome on the floor of the Sigsbee Deep in the central Gulf of Mexico, was mature migrated oil and slightly degraded. This discovery of oil at site 2 of DSDP drilling was instrumental in the establishment of the JOIDES-PPSP. Other oil occurrences were typically anomalous. The show in the Gulf of California was related to occurrence of an igneous sill that provided a local, rapidly activated, contact heat source and hydrothermal cell. The shows encountered in the Tyrrhenian Basin resulted from that region's anomalously high heat flow on the organic-rich sediments of that region. The hydrocarbons encountered at site 535 in the eastern Gulf of Mexico-Western Florida Straits consisted of rich but immature potential source rocks in basinal carbonate slope deposits with degraded mature tar in fractures and undegraded mature oil stains in carbonate sands. This oil probably migrated laterally, up to 100 km, in a fractured zone extending out of the deep Gulf of Mexico basin. Some reported oil shows (site 627 north of Little Bahama Bank) could not be confirmed, perhaps because of failure to seal and freeze the sediments bearing the light, volatile oil.

Clathrates are being studied in the context of the presence of a bottom simulating reflection in the vicinity of the Nankai drill sites and the Vancouver accretionary prism. PPSP's official interest in this subject stems from the safety limitation the presence of clathrates imposes on ODP drilling below the clathrate zone for other scientific objectives. PPSP has agreed to review proposals for drilling clathrates but has no commitment to approve such proposals.

A critique of Exmouth Plateau drilling was done. It was concluded that advice from PPSP played an important role in the safe and successful drilling of Sites 762 and 763 adjacent to commercial wells. Some members, however, expressed misgivings about drilling in known hydrocarbon-generating and producing provinces. PPSP will compile these summaries to provide a guide for future decisions about drilling in similar situations.

SMP

K. Moran presented the annual report for the Shipboard Measurements Panel. During this first year of SMP's existence, the panel has been concerned with: making modifications to current practices, with 70% of the recommendations pertaining to TAMU; suggesting upgrades for the Underway Geophysics and Physical Properties laboratories; integrating sample and downhole measurements (joint with DMP); requests concerning guidelines for use of radioisotopes and special measurements of fluids; specifications for such new technologies as the Pressure Core Barrel sample handler and digital color scanner. SMP recommended improvements in underway geophysics include data acquisition (borrow LDGO high-speed streamer), data processing, real-time navigation, and VSP. SMP recommended improvements in the Physical Properties Lab include a standard-methods document, and a workshop of physical properties scientists. SMP is examining suggested improvements in the Sedimentology-Visual Core Description Lab including upgrades to barrel sheets, digital color scanner, and a bench-top XRD.

The Physical Properties working group within SMP has recommended that for each parameter measured downhole, there should be a corresponding laboratory measurement. SMP will be preparing a technology document on available instruments to meet this goal, and after a joint meeting with DMP next fall, a report will be prepared. Since the request by PCOM that SMP establish guidelines for the use of radioisotopes onboard the *Resolution*, SMP has been examining concerns related to: contamination of laboratories; safety; cost vs. scientific benefit; space for vans. SMP has concluded that even with guidelines, it will be very difficult to maintain isolated areas in routine practice. SMP will be preparing guidelines based on: status of the ship's "cleanliness"; thematic panel input about requirements for their use; results of the UK biological experiment conducted on Leg 128; and UNOLS and member-country guidelines.

SMP has made some specific recommendations for purchase of equipment for the Paleomagnetics Lab ($20K), Petrology Lab ($10-13K), Geochemistry (non-plastic squeezers - titanium), and is evaluating the color scanner, XRD and additional physical properties measurements.

Discussion

Brass wanted to know why SMP is looking at improving underway geophysics since this has not been given a high-priority by PCOM. Moran said that SMP thinks it is negligent of ODP to not collect data while transiting vast areas of the ocean that are not well covered. The cost associated with improving the ability of the vessel to collect this data is negligible.

Brass commented that UNOLS Operation SWAB can check the vessel for radioisotope contamination. Suess said that SGPP will be considering the scientific uses of enriched stable and radioisotope tracers on the *Resolution* at at their next meeting. Garrison said that policies must also be established for any third-party radioisotope experiments concerning who pays for the vans as well as costs associated with checking and decontaminating the vessel. Brass and Kastner also said that this question will be considered at their workshop. Moberly asked that a report be prepared as quickly as possible.

Brass wanted to know why a bench-top XRD was being considered, when there is a good XRD already onboard. Moran said that a more convenient bench-top XRD will provide quantitative data more rapidly than the model now available onboard. Shackleton asked what recommendations had been made concerning the micropaleontology reference collection. Moran said that SMP had recommended that this collection be put back together. von Rad suggested that whole-core radiography would be a useful and not very expensive tool onboard.

SSP

R. Kidd presented the annual report for the Site Survey Panel. SSP provides advice on the adequacy of site-survey data so that there is flexibility to change drilling sites due to different contingencies. SSP also provides advise on the adequacy of data used in the packages that the Data Bank sends to PPSP for safety evaluations.

SSP held two meetings during 1989 at which WPAC and CEPAC programs were evaluated. SSP is concerned that the Old Pacific Leg was scheduled without having all the necessary site survey data available. At the last SSP meeting in Hannover, Old Pacific was reviewed but still did not have the new MCS data processed. Final sites were going to be chosen while the leg was underway. Some important questions about the windows through the cherts and basalt sills were left unresolved. Insertions of sites for both the Nankai and Ontong Java Plateau legs were also somewhat out of order since they went to PPSP before SSP. There is a need to have longer lead times before drilling if SSP is to do its job. Looking towards future legs; SSP has approved sites for E. Equatorial Pacific, Sedimented Ridges and Lower Crust at 504B. For the upcoming meeting at Menlo Park, the attendance of proponents and additional data has been requested for the Oregon and Vancouver parts of Cascadia Accretionary Prism, Atolls and Guyots, N. Pacific Neogene, and Hawaii Flexure. Reviews for Chile Triple Junction and EPR Bare Rock are anticipated for the meeting at Menlo Park.

In order to provide proper advice, SSP needs to know the prioritization of the thematic panels (*i.e.* send copies of the minutes directly to Kidd). SSP is also supposed to look at only those proposals that are "favored" by PCOM, which is not always clearly defined. Other SSP concerns are: proper lead times for

MCS data processing, data package preparation, and detailed near-site survey data; real-time navigation and underway geophysics on the *JOIDES Resolution*; recent lack of a TAMU liaison to SSP; and lack of a post-drilling review to comment on the adequacy of site survey packages to help improve performance. SSP also requests that thematic panel prioritizations take into account the readiness of the program (*e.g.* site surveys, drilling technologies, downhole measurements). From a SSP perspective, legs from the WESPAC prospectus are more ready than many now under consideration for drilling.

Discussion

Austin asked about the adequacy of the data package for the Oregon portion of the proposed Cascadia Accretionary Prism drilling. Kidd said it was mainly a problem of presentation of the near-site data. Suess said that it may not be practical to have thematic panels rank their themes in terms of "readiness". Shackleton disagreed and thought it would be possible.

TEDCOM

C. Sparks presented the annual report for the Technology and Engineering Development Committee. TEDCOM sees itself as being a consultative committee that has a different triangular relationship between TAMU and PCOM. TEDCOM has suggested an additional change in mandate to define its role better from the committee's viewpoint. TEDCOM helped initiate the Engineering Leg trial of the DCS, but had only 1 member onboard the *Resolution* during these tests. On the next Engineering Leg TEDCOM would like to have 2-3 members on the ship. A major drawback of the present system configuration is the time required to remove the platform before tripping the drill string. TEDCOM has recommended that for the next test: 1) Immobilization of the lower end of the API string during all phases of DCS operation; 2) Water depth should be close to 1500 meters to minimize any vibrational problems; 3) Form a subcommittee to advise TAMU on mining drilling; 4) Ask A. Skinner of B.G.S. to be a consultant to the subcommittee on mining drilling from vessels.

TEDCOM also recommends : that the timing of Engineering Legs should suit the engineering developments and not the drilling schedule; superlegs are not suitable; cleaning of the junk in 504B should not be combined with an engineering development leg; the DCS should undergo supplementary land tests; high temperature drilling research should not be duplicated by TAMU since it is being pursued at Sandia and Los Alamos; a workshop on high temperature slimhole logging; increases in the budget for engineering development to take place.

TEDCOM examined the Long-Range Plan in terms of the technological developments that are required. Some problems are under study at present including: chert-chalk sequences; improved core recovery, increased bit life,

and pore-water sampling and pressure core sampler. TEDCOM notes that two important problems are not being addressed: orientation of all core samples; and vibracoring in sandy sequences. Hole stability in difficult drilling terranes is not likely to improve significantly. Very deep drilling of Phase 1 and 2 objectives are realistic but depend on manpower commitment and budget increases. Phase 3 objectives including a MOHO objective may not be realistic and TEDCOM recommends the organization of an International Symposium to address these concerns. Deep drilling with circulation and safety control may be possible if the DCS can be transformed into a mini-riser system.

Discussion

Weissel asked if ODP will be able to do a better job of drilling at the EPR than was done at the MARK area in the Atlantic. Harding said that the DCS should improve the ability to drill there. Storms said that at the MAR the problem was in part due to bigger hole size and the need to change drilling bits. The plan is now to leave the BHA in place and continue drilling with the DCS.

817 Annual Meeting of the Panel Chairmen

T. Moore presented the recommendations that came out of the meeting of the panel chairmen on 26 November 1989 (Appendix D). The panel chairmen recommend that their meeting no longer be held on Sunday of the weekend of the Thanksgiving holiday but rather be changed to Tuesday of the week following Thanksgiving, so that travel would not generally have to begin until the Monday following this holiday weekend. This will necessitate the moving of the start of the Annual PCOM meeting to Wednesday and continuing through Saturday. This schedule will still allow individuals to attend the Fall AGU meeting held during the week following the Annual Meeting. PCOM approved this change in scheduling for the Annual Meeting.

There is a need for groups to do both long-range planning and detailed planning for drilling programs in addition to the thematic panels. The role of **Working Groups** is seen as providing long-range, broader scale planning, addressing specific thematic problems for which the thematic panels do not have the time or the necessary expertise to accomplish. This planning includes determining both the objectives of drilling a particular high-ranked theme and the criteria that must be met to address this theme successfully by drilling. Working groups can also be constituted to evaluate a theme that cross-cuts the interests of multiple thematic panels (*e.g.* Sealevel change) as well as problems that concern both the thematic panels and service panels. It was deemed appropriate that drilling proponents serve on these working groups since they are often experts on the themes being examined and the main job of the group is to set the criteria for successfully addressing the theme. These groups may also need to evaluate which area best meets the

criteria established. This does result in a conflict with having proponents on working groups, but, such conflicts were not perceived to be a great problem as long as a significant number of non-proponents are included and the selection criteria are objectively established. Conflicts of interest must be weighed against the loss of the proponent's expertise if they are excluded. An alternative, and probably unsatisfactory solution, would be to have the thematic panels or PCOM select the best area for addressing the theme.

Detailed Planning Groups do the more focussed planning concerned with selection of sites for a particular drilling program. These groups may be constituted from the working group with addition of proponents, if not already included, and others whose expertise is desired. The Sedimented Ridges Detailed Planning Group was suggested as a model for such groups, since it was originally constituted (more or less) as a working group to establish the criteria and then evolved into a detailed planning group to plan the drilling.

The panel Chairmen emphasized the point that a 4-year general plan is needed to keep the system functioning and this is on the shoulders of PCOM to put together. Some drilling themes in the Long-Range Plan require that there be advanced planning of technological developments to ensure that the necessary engineering developments are ready when needed, TEDCOM needs to continue its role advising TAMU about these developments but with additional direct input from the thematic panels. A working group may be needed to provide advice on this matter.

Problems arising from the new ODP Publications Policy were discussed. Options for handling papers that are not of sufficient quality or submitted too late for inclusion in volumes were recommended, these include publication as data-only papers, inclusion as appendices in later volumes, and outside publication of synthesis papers. The accommodation of the required scientific sampling of cores to carry out the objectives of a drilling leg within the framework of the present sampling policies was discussed; it was recommended that these requirements be specified in the prospectus for the leg and that IHP can then accommodate these requirements.

Inter-panel liaison is important for communication between panels and should be continued. Joint, back-to-back, and overlapping meetings also facilitate interpanel communications. Drilling proposal reviews are adequate and do not need to be sent out for review outside of JOIDES. Proposals under active consideration for drilling should be available to anyone who requests them. The representation on PCOM and EXCOM of non-JOIDES US Institutes is unnecessary. There is an important need for disciplinary balance on PCOM.

Discussion

Brass was concerned that since the prospectus of a leg comes out relatively late, IHP might not have a chance to move on any special sampling requirements before a leg is drilled. Kidd suggested that in these cases the decision could be made by the chairman of IHP. It was also suggested that a request could be made just after the pre-cruise meeting. Kastner was concerned that the current sampling procedures were established many years ago during DSDP, while now ODP is doing different kinds of science. Perhaps a new policy is needed which will take into account these changes.

Tucholke suggested that the recent Workshop on Sealevel Change may fulfil the need for a working group on sealevel. Watkins said the report for this meeting will be published soon.

Austin asked if the panel chairmen thought there was an adequate flow of proposals for highly ranked themes or do the panels need to write their own proposals for some themes. Suess said that for SGPP there are many good proposals per theme, the challenge is to concentrate them to get the best. The response of the community has been strong. Dalziel said that TECP has a spectrum from many proposals per theme to no proposals for important themes. Batiza said that in general LITHP is in the same situation as SGPP and has adequate proposals for important themes. Shackleton said that OHP has a more that adequate flow of proposals, but there are a few instances where stronger proposals are needed.

Tuesday, 28 November 1989

818 Annual Reports By Thematic Panels

LITHP

R. Batiza presented the annual report of the Lithosphere Panel. Important events during 1989 for LITHP included: 1) Approval by PCOM and EXCOM of the ODP Long-Range Plan which spells out a staged, long-term strategy for understanding the origin and evolution of ocean crust and lithosphere; 2) The JOI-USSAC sponsored workshop on drilling the oceanic lower crust and mantle which provided a detailed and logical approach for implementing the deep crustal and mantle phased drilling plan; 3) LITHP reaffirmed its commitment to the following themes for scientific drilling: penetration of normal oceanic crust into mantle; establishing oceanfloor seismic and ridge-crest observatories; investigation of magmatic and hydrothermal processes of crustal accretion at a variety of spreading rates; improved understanding of off-axis volcanism.

LITHP is concerned that implementation of the ODP Long-Range Plan will require detailed planning to ensure that engineering capabilities are brought

on-line in a timely fashion. LITHP suggests that a Deep Drilling Detailed Planning Group is needed to help identify and prioritize the engineering developments that will be needed. The Deep Drilling DPG will also assess deep crustal drilling proposals in the Atlantic and Pacific, set guidelines, and formulate a drilling program. LITHP also recommends that a DPG for the East Pacific Rise Bare Rock Drilling be formed and meet as soon as possible.

LITHP feels that a better disciplinary balance on PCOM is important for promoting the best possible scientific drilling decisions. This will in part help to prevent problems such as that which occurred with Geochemical Reference Sites. LITHP will continue to support drilling at Geochemical Reference Sites, and views this program as very important for the thematic integration of drilling in the Western Pacific (*e.g.* Legs 125 & 126). LITHP urges that the basement objectives on Leg 130 (Ontong Java Plateau) be assigned a high priority for drilling. Continued erosion of these objectives jeopardizes the overall success of multi-objective drilling programs which OJP represents.

Logging of high-temperature holes and/or slim DCS holes is essential for the scientific success of many LITHP drilling programs in CEPAC and beyond. The following prioritized list of logging capabilities was established by LITHP after its joint meeting with DMP on September 11, 1989:

1. Temperature (0°-400°C; 1-2° error)
2. Fluid Resistivity (6% sensitivity; ≤ 5% error)
3. Formation Resistivity (to 1%; standard values)
4. Natural Gamma
5. Sonic
6. Caliper
7. Flow-rate (spinner)
8. Pressure in well-bore

Of the above measurements, temperature is the most essential. Other desirable measurements (not in priority order) are:

Ca^{2+}, pH, resistivity and temperature on wireline packer
Permeability
Fluid Sampling
Porosity
V_P, V_S
Televiewer
Seismic Anisotropy
Full VSP
Magnetic Susceptibility and Intensity
H_2S Detector

For the eventual success of global seismic arrays, LITHP urges that more re-entry cones be routinely deployed by ODP.

LITHP rankings of the 6 CEPAC programs under consideration for FY91 drilling are: 1) Lower Crust at 504B; 2) Sedimented Ridges; 3) EPR Bare Rock; 4) Chile Triple Junction, 5) Cascadia Margin; 6) East Pacific Neogene.

Discussion

Brass and Sparks asked about the composition of the Deep Drilling DPG. Batiza said that the membership would come largely from TEDCOM, LITHP, TECP, SGPP and possibly from the community outside of ODP with interests in deep drilling. Moberly suggested that at the next TEDCOM meeting, the issues concerning planning for deep drilling be placed on the agenda and that the thematic panels with interests in deep drilling send a representative. TEDCOM will then make recommendations about formation of a group to deal with these problems. Kidd suggested that a working group might be more appropriate than a DPG. Natland asked who would be deciding the best location to implement a drilling program to the mantle. Batiza said that this would be the job of a DPG.

OHP

N. Shackleton presented the first annual report for the Ocean History Panel. For the most part OHP approved the mandate for the new panel with only minor suggestions for improvement. The only item of concern is Sealevel. This major scientific problem is at present the responsibility of both OHP and SGPP and receives fragmented attention. The OHP portion of the SOHP White Paper was written in anticipation of the splitting of the panel and OHP regards this White Paper as valid for present purposes. During 1989, OHP reviewed about 25 new proposals that have some significant OHP interest.

At the next OHP meeting, at least 15 proposals will be prioritized in order to assist PCOM in developing a 4-year tentative route for the *Resolution*. It is anticipated that several Pacific proposals previously highly ranked by the former SOHP panel will remain very high on the OHP list. Both the Bering Sea and the Norwegian Sea are areas that must be drilled to help focus future Arctic work. Within the high-priority Neogene theme, the Eastern Equatorial Pacific Neogene Transect is an exceptionally good program and OHP unanimously recommends its inclusion in the FY91 drilling.

The purpose of Neogene (High Resolution) Paleoceanography is to understand how the present surface and deep circulation (and its variability in response to Milankovich forcing) have evolved as a result of changes in the external boundary conditions. The approach used is to drill transects of sites in key areas across important gradients. These transects are designed to capture the limits of the relevant features of the ocean and to measure their

anticipated variation. The tools used are: micropaleontology, stable isotopes, geochemistry, sedimentology, etc. The output of these experiments is the history of the system investigated, including: surface and deep temperatures, currents, productivity, atmospheric circulation, changes in ocean elemental budgeting, etc.

OHP spent some time in considering the planning of upcoming Leg 130 (Ontong Java Plateau) which was scheduled at the last Annual PCOM meeting. OHP favors drilling OJP-3 (deeper) rather than OJP-6. The Co-Chiefs may reverse this on the basis of their findings in the other sites. If for some reason time becomes available unexpectedly, OHP advocates returning to drill OJP-6 as well as OJP-3. At OJP-1 time should be devoted to double-XCB work in the Miocene section. The APC part of the hole essentially would duplicate DSDP Site 586 which already well-covers this section.

Discussion

Austin asked if deep stratigraphic tests are still an approach that is of interest to OHP. Shackleton said that it continues to be of interest. von Rad wanted to know if the two proposals for Atolls and Guyots could be combined into one leg. Shackleton said that this is unlikely. There is interesting paleoceanography in both proposals. Kastner asked about the impact of sampling policies on the science in high resolution studies. Shackleton said that as long as the prospectus spells out the sampling needs, they should be accommodated.

In regards to drilling on the Ontong Java Plateau, Jarrard suggested that the FMS might be useful in determining gaps in recovery at OJP-1 since it has been successfully deployed in soft sediments. A discussion ensued about what to do if time becomes unexpectedly available for drilling after OJP-3; whether to use it to deepen drilling into the basement beyond 50 m at OJP-5 or to drill a hole at OJP-6. After a lengthy discussion the following consensus was reached.

PCOM Consensus

1) If more than 6 days are available at the end of completing the proposed drilling at sites OJP-4, -3, -2, -1, -5, the latter 50 m into basement, then that time should be spent transiting back to OJP-6 and coring at this site; 2) If less than 6 days are available at the end of completing the proposed drilling, then that time should be spent deepening OJP-5 further into basement; 3) If drilling is 4 days ahead of schedule after drilling at OJP-4 and OJP-3, then OJP-6 should be drilled before continuing with the program in the prospectus.

It was pointed out that OJP-6 had not been reviewed by the safety panel. Garrison and Ball agreed to take care of a quick review of this site.

SGPP

E. Suess presented the first annual report for the Sedimentary and Geochemical Processes Panel. During 1989, reviews of proposals was the single most time-consuming and generally overwhelming agenda topic. SGPP reviewed more than 48 proposals, with about 75% within the realm of thematic interests of the panel. Of the six programs under consideration for drilling in FY91, SGPP was concerned with those involving convergent margins and hydrothermalism. SGPP rankings of these programs were: 1) Sedimented Ridge Crests; 2) Cascadia Accretionary Prism; 3) East Pacific Rise Bare Rock Drilling; 4) Eastern Equatorial Pacific Neogene Transect; 5) Lower Crust at 504B; 6) Chile Triple Junction.

SGPP has examined its mandate as well as the parts of the SOHP White Paper within the panel's mandate and has drafted a new version of the White Paper. Chapter headings defining areas of SGPP thematic interest are: Sediment Fluxes; Sealevel; Fluids & Gases; Metallogenesis; Paleocean Chemistry; Technology. Proposals are generally being grouped to match the chapters of the White Paper; this should ensure optimal functioning of the panel.

Technological developments are needed in the areas of sand recovery, pressure core barrel phase II, and pore-water and gas sampling. SGPP is concerned that a TAMU engineer was unable to attend their meeting. SGPP has suggested that D. Stow or W. Normark serve as *ad hoc* liaisons to TEDCOM to track developments in sand drilling, for which there is a renewed interest and requirement for addressing important panel themes. Part of the SGPP mandate is fluid circulation in the lithosphere. Technological and scientific advances since the time of DSDP require a major overhaul of fluid and gas sampling and analytical procedures. SGPP is preparing fluid sampling recommendations for SMP concerning: minimizing artifacts, optimizing PCB-II, high temperature regimes, packers, instrument holes, and sampling policy. For the PCB Phase II, SGPP is recommending the following features: multiple lock-on chambers, physical properties of clathrates, imaging of internal structures, controlled sub-sampling, microbial rate-experiments with incubation and injection of poison, P-T phase stability experiments, calibration of logging parameters. For the PCB Phase III, SGPP suggests: titanium construction, thermal history during recovery, self-squeezer. To help eliminate artifacts due to the present shipboard sampling procedures, SGPP recommends titanium squeezers, *in situ* temperature squeezing, inert atmosphere squeezing, and flexible sample frequency policy.

SGPP is concerned that sealevel gets fragmented attention in ODP. Sealevel is of thematic interest to several panels. There has been a large number of proposals concerned with this topic. It is of interest to a wide spectrum outside of ODP as part of the Global Change Program of the International

Geosphere Biosphere Project. Sealevel change provides high visibility for ODP. SGPP recommends that a Working Group be formed to define an ODP plan for studying Sealevel change by drilling.

SGPP has been discussing the thematic needs for the use of radioisotope experiments on the *Resolution*. SGPP sees several important studies which will require their use on the vessel, these include: microbial rates, fluid flow, cross-well tracers. SGPP will be discussing this matter further at the next meeting and will then give its input to SMP and DMP.

SGPP is still in need of additional panel members in the area of ocean floor petrology, sedimentary processes and would like to retain M. Goldhaber for an additional year on the panel. SGPP recommends the formation of a DPG for the Cascadia Accretionary Prism. Both proposals are of high thematic interest to SGPP, although Oregon has greater fluid-dominated aspects.

Discussion

Storms said that TAMU was not able to send the person working on vibracoring to the SGPP meeting. Garrison said TAMU does recognize that engineering input is necessary for developing the science plan but time constraints and limited travel budgets put restrictions on the number of meetings to which representatives can be sent. Rea said that the visit of the TAMU engineer to CEPAC was very helpful and led directly to the recommendations around which the next Engineering Leg was planned. He said that these visits should be encouraged. Garrison said that a special invitation outlining the panel concerns would be helpful. Leinen suggested that more meetings at College Station might be necessary. In this way a variety of expertise is available without putting much strain on the TAMU engineer's time and the travel budget. Shackleton said that TAMU input is important for all panels. Moberly said that Leinen's suggestion is good; questions concerning technological developments should be concentrated into one meeting close to TAMU.

Cowan asked if outside reviews of drilling proposals would help ease the burden placed on thematic panels. Suess said that he does not see outside reviews as being a solution, the panels will still have to review the proposals themselves. One possible solution would be to spend time at meetings reviewing only those proposals of high thematic interest. Moore said that more working groups and detailed planning groups are needed to carry out the detailed work. Brass and Detrick agreed with Moore.

Leinen said that the Sedimented Ridges Program recommended by the DPG consists of two drilling legs; should PCOM commit to scheduling both legs or is one higher priority than the other? Suess replied that the program is not a question of leg 1 vs. leg 2, the plan is to drill leg 1 then wait an appropriate time to get the results necessary for drilling the second leg. If the program is

limited to only one leg, then it would have to be completely redesigned. The program is highly recommended the way it now stands.

TECP

I. Dalziel presented the annual report for the Tectonics Panel. Highlights for 1989 include: publication of the TECP White Paper in the JOIDES Journal, transition in planning from a regional mode to the thematic mode, Japan Sea downhole electrical resistivity and seismometer experiments, and interpanel planning. TECP has overlapping interests with the other thematic panels which include: accretionary prisms with SGPP; paleogateways and climate change with OHP; and structural evolution of oceanic lithosphere and hydrothermal circulation with LITHP.

TECP ranked the six programs under consideration for drilling in FY91 in the order: 1) Chile Triple Junction Leg #1; 2) Cascadia Margin Leg #1; 3) Chile Triple Junction Leg #2; 4) East Pacific Rise Bare Rock; 5) Sedimented Ridge Crests Leg #1; 6) Cascadia Margin Leg #2; 7) Lower Crust at Site 504B; 8) Sedimented Ridges Leg #2; 9) Eastern Equatorial Pacific Neogene Transect.

TECP recommends that a working group to address strategies for drilling accretionary prisms needs to be formed in cooperation with SGPP. Another working group or a workshop is recommended to formulate strategies for studying continental breakup and the associated volcanism. This should include continental geologists to help integrate models based on ocean margin and on-land studies. TECP also supports the formation of a Deep Drilling Working Group.

TECP no longer supports the Hawaii Flexure proposal strongly, but a hole to study secondary igneous activity and for placement of a downhole seismometer off of Hawaii receives strong panel support. TECP recommends that ODP make holes available for the placement of downhole seismometers TECP is concerned that proposals for making stress measurements, for studying plate dynamics, may not appear until the general track of the ship is known.

Discussion

Moberly suggested that a workshop would be a more appropriate setting than a working group for formulating strategies to study continental breakup and associated volcanism Someone needs to take the lead in approaching JOI/USSAC concerning this. Austin said that there have been a large number of ODP drilling proposals for studying these processes in the Atlantic; perhaps a DPG is needed to sort them out since we are changing the way we approach these things.

von Rad posed the question of whether the Deep Drilling Working Group would be primarily scientific or technological in nature. He said that volcanic-margin drilling will also require deep penetration. Dalziel replied that the strategy for volcanic margin drilling would be to avoid having to penetrate 5 km of basalt and sediment. There is a need for technological planning if ODP is to develop the capability to conduct these kinds of studies.

Because of a concern that TECP has some themes that have not been addressed by drilling proposals, Kastner suggested that TECP do something similar to LITHP and place an ad soliciting proposals for its high priority themes. Austin thought that this might be a good idea for ODP in general after establishing the 4-year general track of the vessel.

819 Non-JOIDES Representation in Planning Process

J. Baker president of JOI discussed the reasons for the recent initiative to place someone from a non-JOIDES Institution on PCOM. There had been some questions about the openness of the planning process in the PEC I & II reports. There was a concern that institutional appointments may not always provide the best science advice to ODP. USSAC was formed to widen the advice to the program. Members of USSAC come from both JOIDES and non-JOIDES institutions. Institutional appointments were discussed by the JOI Board of Governors. The initial suggestion would have replaced one of the JOIDES institutions for a 4-year period. The latest proposal would leave a JOIDES Institution out of PCOM for only 1 year in every 8 years. The JOI Board of Governors have given a mixed to negative response to the last proposal. JOI is examining other mechanisms for including non-JOI advice in the planning structure at the request of the JOI Board of Governors.

Discussion

Moberly said that scientific advice does come, from the one-half of the panel members from non-JOIDES institutions. Baker said that there is a sense that since non-JOIDES members cannot serve on PCOM, they cannot make decisions about where the ship goes. Rea suggested that this was the feeling of only a few individuals and not a large community. Moore said that the panel chairmen addressed this question and there is good broad scientific input and advice; JOIDES, however, should strive to maintain the present balance with about half of the advisory structure from non-JOIDES institutions. Brass suggested that there is no real problem since PCOM is planning what the community wants drilled. Brass questioned whether the individual chosen would be a true outsider or someone at a non-JOIDES institutions with many ties and involvements with JOIDES institutions and ODP. Austin said that it is important that PCOM maintain a disciplinary balance. Baker said that the balance question should be examined when a member rotates. Moberly said that C. Helsley had asked EXCOM to address the balance question.

Leinen asked if the initiative was an attempt to sell the program as a part of the renewal process. Baker said that the initiative is to try and make the program stronger by gathering a larger community behind ODP. Kidd thought that ODP does not need to defend itself by changing the structure that works since the evidence is that the program is open to advice. Rea and Moore said that interested faculty at their non-JOIDES Institution discussed the question and do not see any reason to change the present structure.

Kastner said that if another partner is added to ODP, that would be the time to make adjustments in the structure of PCOM and possibly JOIDES. Dalziel asked if another US institution could join JOIDES. Baker said that the original concept of JOI was a small group of oceanographic institutions which met certain requirements concerning faculty size and research programs. Additions to the membership could be considered.

Weissel asked what the prospects were for adding new international partners. Bake said that the prospects for having the USSR join are improving. The new administration appears to be more open to USSR participation. Other possibilities include a consortium including South Korea and one formed by the International Oceanographic Commission. Brass said that members of PCOM could help with the IOC. von Rad asked if adding new members would provide more funds for technological development. Baker said that there is no guarantee that the $2.75M would go to ODP.

820 Status of Engineering and Technological Developments

Slimhole & High-Temperature Logging Meeting

B. Harding of TAMU-Engineering talked about the joint meeting of drilling and logging personnel associated with both the Continental Science Drilling Program (CSDP) and ODP held on November 17 1989 in College Station, Texas, to discuss the present status of logging tools compatible with running in both 4-inch diameter holes and in holes in which the equilibrium temperature is ≥300°C. The following items were discussed and agreed concerning joint cooperative efforts by the CSDP and ODP: 1) Drilling (DCS in particular) and logging must be viewed as integrated systems and both considered in achieving the optimum solutions; 2) The entire present logging suite of tools currently run by both CSDP and ODP do not conform to a 4-inch outer diameter (O.D.) hole and will not achieve even 200°C in hole temperature; 3) Cooperative efforts between the various agencies of the Interagency Coordinating Group (ICG) and ODP should be pursued in order to pool both human and fiscal resources regarding logging tool repackaging for slimhole and hothole conditions; 4) Since the majority of present day logging tools cannot meet more than 200°C as well as a 4-inch O.D. hole, reasonable goals should be established for the short term (18 months), medium term (2-5 years), and long term (> 5 years) in defining the priorities for tool repackaging, dewaring or new tool development; 5) Letters proposing joint logging tool

efforts should be written to the Interagency Coordinating Group, and also proposed to ODP's PCOM.

Kappel said that T. Pyle has sent out the letter to the ICG participating agencies. Kastner asked what the next step should be if $1M is available for developing these tools. Worthington said that ODP will see what can be done with existing tools in regards to the limitations imposed by temperature and hole size. There will be a focus on measurements which cannot be made from core. Batiza was asked about LITHP priorities for logging measurements and he presented the list given previously (see Minute 818). Brass asked why fluid resistivity was so important when the borehole fluids will be drilling fluids unless the hole is flowing. Fluid resistivity measurement are important for identifying zones of fluid inflow. Detrick said that pore fluid sampling is very important but has been given low priority because the technological feasibility is low and fluids can be sampled from cores.

Storms said that E. Davis has visited TAMU to discuss the possibility of placing a plug in the reentry cone with feed-through connectors into the hole for sampling and monitoring. TAMU thinks that a simple plug is feasible and that the plug could be removed by the *Resolution*. Third-party development of the plug is most desirable. ODP-TAMU will review the design, operation and technological compatibility. The sensor and data package will have to be done by outside parties, but the seal can be constructed by TAMU. Detrick said that Davis is taking the lead in development of a recording package and Becker is looking into sensor development. Harding said that TAMU needs input on the importance of this plug, since there must be a commitment of time and resources to have it available.

Tucholke said a list needs to be prepared spelling out what is needed based solely on scientific desirability, what will be possible, and when these tools will be available. The list of scientifically desirable measurements needs to be prepared by the thematic panels (done for LITHP; needed from SGPP). DMP will need to evaluate which are possible and when they might be available.

R. Jarrard of the LDGO Borehole Research Group discussed slimhole and hothole logging developments. A prospectus for downhole measurements for CEPAC programs was distributed. ARCO has given the BRG a suite of slimhole logging tools that is of a mid-1970's technology. A review has been prepared of what tools exist. Hole cooling models have been run to simulate conditions in a 4-inch DCS hole and in a standard RCB hole. Using a cooling strategy with circulation and logging using the Side Entry Sub, the temperature in a RCB hole should not exceed 150°C, while in the DCS hole the temperatures approach the equilibrium profile and are too hot for the current suite of logging tools.

The *Atlas Formation Scanner* can be used to measure temperature, pressure and flow in 4-inch holes. Two of these tools would cost about $625K and

require about one year lead-time for their purchase. These tools can be leased for about $10K per day. These tools are quite reliable and are heavily used by industry. It is not reasonable to expect Sandia to lend ODP their high-temperature tools continuously for 2 years.

The BRG now recommends that a caliper tool be used in the DCS hole on the Engineering II Leg, to test the ability to deploy slimline tools if there are caving and bridging problems. Harding said that the caliper tool and another dummy tool can be run on this leg. Natland said that the caliper and natural gamma would be useful to have at Shatsky and should be tried there if time is available. Storms said that the caliper measurements would be useful in evaluating drilling tests.

Jarrard said that BRG will not receive the $180K requested for slimhole and hothole logging until October 1, 1990. It is unlikely that these tools can be ready in 6 months. Watkins asked how critical these tools are to the success of the leg. Batiza said that temperature is critical, but other measurements can be done on core or logging can be done at a later time. Brass said that this assumes about 95% core recovery.

Engineering Developments

B. Harding then presented the status of various engineering developments. A handout giving the details of their status was distributed. The developments discussed were: Navidrill Core Barrel (NCB3) which is to be constructed and then land tested sometime in mid-1990; Sonic Core Monitor (SCM) has been shown to work and will be tested further on Leg 130; Drilling and Straddle Packers (TDP & TSP) are ready for use on Leg 131 (Nankai) and manuals are being prepared; Advanced Piston Corer-Design Upgrade (APC) is being worked on and will be available on Leg 130; APC Breakaway Piston Head (BPH) is almost completed and will be field tested on Leg 130; Pressure Core Sampler (PCS) is ready for use on Leg 131 (Nankai) and the Phase II is awaiting input from SMP and SGPP; Vibra-Percussive Coring (VPC) is under design and a pre-prototype model is scheduled for completion by December 1990. Technical support of third-party developments continues to be a significant role of ODP engineering, these include the new Side Entry Sub (SES) of the Lamont BRG which is undergoing further design work and should be ready for sea trials around Leg 133 (NE Australia); Reentry Cone Plug which is under discussion with E. Davis and others; the Geoprops Probe being developed by Dan Karig and still in the design phase and probably will not be deployed before Leg 134 (Vanuatu) well after Leg 131 at Nankai; Lateral Stress Tool (LAST) being developed by K. Moran and should be ready for use at Nankai; and the Pressure Meter also being developed by K. Moran which should be tested by late January 1990 but is not scheduled for use at Nankai. The Development Engineering schedules (Appendix E) were shown.

Discussion

Kastner asked why there was no anticipated completion date for the Navidrill. Storms said that until there is another field test of the Navidrill the amount of work needed to complete the design is unknown. Kidd asked about the availability of funds to work on these projects. Harding said that the 4000-m DCS system cost more than estimated, but there appears to be adequate funding for the present developments. One problem is the loss of two visiting engineers will mean that no new major projects can be undertaken although minor projects will be handled.

Detrick asked if the sealable plug for reentry cones needed to have PCOM approval to have the work begin on construction. Harding said that manpower can be put towards the planning but money for the material to build it must be put into the FY91 budget. The sensor and data package will have to be designed and constructed by third-parties, but the seal can be constructed by TAMU. Detrick said that it is important that a seal be ready regardless of whether or not there is an instrument package available for deployment at the time of the drilling. The seal will be essential for the hydrothermal programs at Sedimented Ridges, EPR Bare Rock, and Cascadia Accretionary Prism. Moberly summarized the consensus of PCOM that the seal should be ready for the drilling of these three hydrothermal programs and TAMU should be asked to have the seal ready for the drilling at these sites.

Shackleton asked if the DCS would be available for drilling reefal limestone on the NE Australia Leg. Harding said that there would be a problem with degradation of the system if it was simply stored on the *Resolution* and not used on the rig. There would also be a problem storing the mining drill rods because of space limitations. Storms said that there would also be other problems such as having experienced drilling personnel and having the proper hardware such as guidebases on board. This is a proto-type system and cannot be used routinely at this stage.

Operational Plans for Second Engineering Leg

M. Storms distributed the Leg 132 Prospectus as well as a handout on Phase II of the DCS. He reviewed the improvements that have been made in the system since Leg 124E which include: redesigning the secondary heave compensator; switch to an electric top drive and wireline winch; modifications to platform and mast, improvements in drill rod string; new core barrel assembly; wider selection of cone bits; mini-hardrock guidebases; and back-off sub. The Phase II of the DCS will be tested in mid-January at the DRECO yard in Clearlake, Utah. Another land-test in fractured rocks is planned at the Kennecut Copper open pit mine in Salt Lake City, Utah sometime in February 1990. The DCS will be shipped to Pusan, Korea sometime in March 1990 for sea-tests on Leg 132. The drilling crew on this leg

will not be the same as was on Leg 124E, and will have to be trained in the use of the DCS. Storms next went through the plans for Leg 132 as given in the prospectus. Storms said that the vendors have also put in a lot of engineering time and effort in developing the system. The science support from JOIDES is also expected to improve this test of the DCS.

Discussion

Kidd requested that the *Resolution* collect site survey data on its way to Shatsky Rise since this region is poorly surveyed. Storms said that there was no time planned for surveying other than during the approach to the site.

Kastner was concerned that the proposed drilling on MIT Guyot was not sited in the reefal facies, which was the intention of drilling at this site. Natland said that the extent of the reefs is uncertain and the plan was to drill where it would be easier to start a hole. Tucholke said that the intent was a real test of the ability of the DCS to recover the karst reef and not the lagoonal sediments. Natland said that the test of the DCS should not be determined by our ability to place the guidebase. Tucholke and Kastner said that the test should be done on the reef. Moberly said that the challenge is to drill and recover both reef rubble and other sediments. Brass said that since the plan is not for deep penetration, the siting should ensure that the reef is not missed and therefore should be sited on the reef. Moberly said that the consensus of PCOM is that the DCS test on MIT Guyot should be sited on the reef.

Future Engineering Legs

Harding said that preliminary plans are being made for two additional Engineering Development Legs. Engineering III will be devoted to cleaning 504B and setting the hardrock guidebases and spudding-in at the EPR Bare Rock Drilling sites. Engineering IV (Appendix E) will test: new developments of the DCS; various tool developments including the sonic core monitor, feasibility of drilling a 3 km-deep hole in sediments; vibracoring of sediments; new generation of drilling packers; and high-temperature tools.

821 Issues Related to Community Concerns

Members of the JOIDES Community have raised the following issues with the JOIDES Office. In one form or another they have also been on the mind of the PCOM Chairman. Necessary, action should be taken to solve, if possible, those considered by PCOM and the Panel Chairmen to be serious problems. If not a specific action now, there might be an *ad hoc* committee formed to report its advice at a later meeting.

1. Planning for long-range technological developments. The Long Range Plan is divided into phases, to allow engineering developments in advance of drilling. At present a major effort aimed at better core recovery is maturing

with the development and testing of the diamond coring system. Another major effort is evolving towards high-temperature drilling and logging. Deep drilling is planned for later phases of ODP. LITHP wants to penetrate to the mantle; TECP and SGPP want to learn about the deep parts of accretionary prisms; OHP wants deep stratigraphic tests near the margins of continents. Who or what group will begin the task of evaluating what needs to be done, and the timetable? Should there be special working groups? Should TAMU be charged with the scheduling? If so, from what parts of JOIDES will they receive advice? Should this wait for COSOD III?

This matter came up during several previous discussions and the decision was that TEDCOM needs to continue its role advising TAMU about these developments but with additional direct input from the thematic panels. A clearly defined and prioritized set of objectives is required from the thematic panels. A working group may be needed to provide advice on this matter and this will be decided after TEDCOM makes its recommendations.

2. Weight of PCOM decisions. Can there be a mechanism to make it more difficult for PCOM to change its decisions? Or, if a problem does exist, is it because decisions are made without careful consideration of the issues? During the days of DSDP, including IPOD, more than a bare majority was needed at PCOM for a decision. Admittedly, there were some procedural problems when members had to leave a meeting early if they did not leave a proxy with someone. Should PCOM follow the example of EXCOM, which "shall reach its decisions by the affirmative vote of at least two-thirds of all members, including members from at least three non-US members"? Will this, or some other way, ensure careful consideration of issues?

This matter was deferred to the next PCOM meeting.

3. Mix of activities of DPGs and thematic panels. Thematic panels have the best view of the thematic importance of a particular program or leg. To what extent, if at all, should thematic panels be used for detailed site selection and calculation of drilling times? A DPG might be ideally constituted to judge proposals from from other areas on the same theme. To what extent should a DPG be used to evaluate proposals?

This matter was discussed extensively by the Panel Chairmen who have made recommendations for the formation of DPG's and Working Groups (see Minute 817).

4. Final planning (or, cramming it all into a leg). Every group or person wants to be the last one to plan or comment about a leg. Thematic panels who had no earlier interest in a leg want to add work after a leg is accepted. Thematic panels who did have earlier interests in a leg are unhappy when a DPG reaches a compromise that is less than all of the wishes of all of the panels. DMP and BRG are unhappy when all of their logging

recommendations cannot be fit into the time available. PCOM wants to send liaisons to the pre-cruise meetings to ensure that its objectives are covered. Can we be kindler and gentler? Are we missing something in communications? Or is it the nature of a multi-million dollar project to bring out so much unhappiness when one's own project is not completed to the degree one had hoped?

During the earlier phase of DSDP (based on regional panels) and in the later IPOD phase (based on thematic panels), PCOM took the advice of its panels and of its liaison to DSDP, and PCOM planned the legs (which sites, what objectives, what transit times, and so on). PCOM then nominated Co-Chief Scientists to carry out what they had planned. With rare exceptions it seemed to work.

5. JOIDES closed to peer review of new ideas. We have heard the expression that greatest obstacle to a continuation of ODP is neither a shortage of funding in the various countries nor non-JOI participation in high level decision-making. Rather, some have pointed to the lack of outside peer review of proposals. The case is presented that a small community of scientists on JOIDES panels leads conferences, writes white papers, receives proposals, and judges them against the themes they established. Further, this community, by virtue of nominating their successors, perpetuate their ideas (now, indeed, panels can write their own proposals!). The allegation has been made that it is exceptionally difficult to get a fair review of new scientific ideas. A single leg is more than a $3M project, counting all parts of its planning, operations, and data interpretation. Should not there be outside reviews of such expensive proposals, especially of ones that do not fit within the top themes of panels? Should there be outside reviews of such major planning documents as the Long Range Plan, panel white papers, and the COSOD reports?

We have tried to bring in "fairness" into the decision-making process by establishing a particular process (proposals matched to published thematic objectives; proposals placed in programs; programs ranked regardless of location). Is this the proper process?

This matter was also discussed by the Panel Chairmen (see Minute 817) and was not judged to be a major problem. PCOM does upon occasion solicit advice from outside of JOIDES concerning proposals.

6. Publications: quality, speed, and costs. The JOIDES Office continues to receive comments from IHP, TAMU, Co-chiefs, and leg participants about publications. Different countries and different disciplines view ODP publications from different perspectives. Not all of the proposals in the IHP minutes seem to reflect the desire of the EXCOM and PCOM to speed publications and to get publications into the open literature. Co-chief scientists of two legs, who have long histories of service to JOIDES, are not

pleased that cruise synthesis manuscripts are so vulnerable in the schedule. Is the Editorial Review Board a solution or part of the problem?

This matter was discussed by both the Panel Chairmen (see Minute 817) and during the annual report of IHP (see Minute 816).

7. Shared advice and shared decisions. Occasionally JOIDES advice is needed before a regular PCOM meeting. In the case of ship operations and budget matters, simple and rapid procedures are in place. Requests from the ship regarding unexpected operations, changed sites or drilling and logging programs, etc. go from the ship to Lou Garrison to the PCOM Chairman and, if necessary, the JOI Program Director, or for safety matters, the PPSP Chairman. In the case of budget matters, the 5-member BCOM can act for both PCOM and EXCOM. In many other matters, the PCOM Chairman can and does contact panel chairs and PCOM members for advice. There have been questions about how adequate these procedures are. Should there be a small subcommittee of PCOM to join on a conference call before decisions that cannot be put over until a regular PCOM meeting? If so, should it be formally established as a "management council" or "crisis committee" or whatever (size?; how constituted?), or always be on an ad hoc basis? Should there be a formal requirement to contact thematic chairs or other chairs before certain kinds of decisions? If so, what kinds?

After discussion the general consensus of PCOM was that the PCOM Chairman should make these decisions and there was no reason to have a special subcommittee formed. In the event that R. Moberly is not available to make an immediate decision, J. Austin will stand in if necessary.

Wednesday, 29 November 1989

822 Detailed Planning for Easternmost Pacific Drilling

D. Rea reported the results of the three meetings by the Central and Eastern Pacific Detailed Planning Group during 1989. An update of the CEPAC Prospectus was distributed. The CEPDPG recommends the formation of both a Cascadia DPG and an East Pacific Rise DPG. The CEPDPG should meet one more time to prepare a Third CEPAC Prospectus. In addition to the six programs under consideration for drilling in FY91, the following programs are also being considered: Downhole Seismometer Off Hawaii; North Pacific Neogene; Bering Sea; Shatsky Rise; Atolls and Guyots; Hawaii Flexure; and Loihi. The North Pacific Neogene has received new impetus since carbonate fossils are now known to be preserved. Pelagic windows through the turbidites are found on seamounts in the Gulf of Alaska. There are multiple objectives for the proposed drilling including: Paleogene and Cretaceous paleoceanography; atmospheric circulation; and plate kinematic objectives. The Atolls and Guyots program has two separate and distinct proposals, both of which are good and address important themes. Loihi Bare Rock would

require a hardrock guidebase but is otherwise ready to go to study the early phase of ocean island volcanism. Hawaii Flexure is not receiving much support these days. Shatsky Rise will have some drilling during Leg 132 Engineering II. The status of the six CEPAC programs under consideration for drilling in FY91 are given in the CEPAC Prospectus Update.

Cascadia

The Cascadia Margin has two competing proposals. The proposal for the Oregon portion of the margin has been updated after several recent cruises. More is known about fracture control of the venting of fluids and the locations of active vents. The proposal for the Vancouver portion of the margin has evolved from a deep hole into more of a hydrological and deformation processes study. Several recent Canadian cruises have indicated that the fluid expulsion is not controlled by fractures. A DPG is needed to sort out these two programs, since CEPAC lacks the adequate expertise.

Discussion

There was a general concern expressed by PCOM that the objectives for drilling at Cascadia are not well-defined. Suess said that SGPP views the drilling as being important for understanding the global geochemical cycling of elements in the ocean. The Oregon proposal is favored by SGPP because the relationship between fluid flow and tectonic structure is better understood. The fluid flow aspects of the Vancouver proposal would be better understood after drilling. Dalziel said that with the present technology, TECP favors drilling the Oregon part of the margin to understand the fluid flow aspects. Crawford said that in terms of fluid flow from accretionary prisms, the Vancouver margin appears to represent the diffusive end of the spectrum, while Barbados represents the focussed end. Oregon appears to lie between the two ends.

PCOM expressed a general concern about whether drilling at Cascadia would require one leg or two legs and if so, what would be included in these legs. Cowan was concerned that estimates for drilling are around 90 days for five holes, but more holes may be needed to do the job. Measurements of pore pressures and permeabilities will be important aspects of these legs, but packers are not recommended for making these measurements; How will this be accomplished? Kastner said that from a thematic viewpoint, PCOM should commit to one leg of drilling. Watkins said that until some information from drilling is available, the question of how many legs cannot be answered. Tucholke said that there is still some uncertainty about the best places to drill accretionary prisms; Is Cascadia the best area to answer these kinds of questions? Dalziel said that a Working Group on Accretionary Prisms was requested over one year ago to develop the strategies for drilling in accretionary prisms. TECP supports one leg of drilling at Cascadia and recommends that a DPG be formed to choose between the two proposals.

Suess said that there was no lack of long-term planning to address accretionary prism drilling in a world-wide context. Long-term goals have been set out in the Long-Range Plan with a strategy involving drilling various end-members of sediment type, convergence rates, and structural styles; Cascadia is part of this planned drilling.

Sedimented Ridges

R. Detrick presented the plan for drilling to understand Hydrothermal Processes at Sedimented Spreading Centers, prepared by the Sedimented Ridges DPG after its June 13-15, 1989 meeting in Ottawa. The detailed plan can be found in the CEPAC Update. The SRDPG examined competing proposals for drilling at the Guyamas Basin, Escanaba Trough, and Middle Valley. The criteria used for selection of the drilling location was based on the Sedimented Ridges Working Group Report which established two objectives for drilling of sedimented ridges: 1) A 3-D characterization of fluid flow and geochemical fluxes within a sediment-dominated hydrothermal system; and 2) A systematic investigation of the processes involved in the formation of sediment-hosted massive sulfide deposits. The Middle Valley area on the northern Juan de Fuca Ridge was selected as the site of the hydrologic study based on the simplicity of its tectonic setting, the level of current hydrothermal activity, and the completeness of site survey information.

An array of seven holes is proposed. Objectives for drilling include: 1) the size of the geothermal reservoir; 2) where does recharge occur; 3) what controls the localization of fluid discharge; 4) how does fluid move through the system; 5) what controls the fluid chemistry; etc. The highest priority is a single basement reentry hole drilled into the high-temperature reaction zone of the active system. Complementing this hole is an array of six shallower holes to define the pattern of fluid flow over a 100-200 km^2 area of Middle Valley. At all seven holes an extensive program of logging, fluid sampling, and borehole experiments is recommended, including hydrologic sealing and *in-situ* monitoring of temperature and pore pressure as the holes re-equilibrate after drilling is completed.

The SRDPG selected two sites in Middle Valley and a third area in Escanaba Trough along the southern Gorda Ridge for a sulfide drilling program. These deposits display differences in the level of current hydrothermal activity, the size and maturity of the deposits, and sulfide composition and fluid-rock interactions. The closely-spaced shallow holes and deeper drilling recommended in these three areas have been carefully integrated with the hydrologic study and will provide important constraints on the three-dimensional structure of these actively forming deposits, the effects of differing hydrothermal fluids and source rock interaction on their

composition, and the nature of post-depositional alteration within the sulfide mounds.

A total of about 115 days is required for drilling, logging and sampling, exclusive of transit times. Thus nominally two legs will be required to carry out the program recommended by the SRDPG. Ideally, these legs should be separated by about one year to allow hydrologic modeling of the initial drilling results to guide selection of the deep reentry holes; to monitor the re-equilibration of holes that have been hydrologically sealed after the first leg, and to provide additional time to develop the tools needed to drill into the hottest parts of the hydrothermal system. The SRDPG strongly recommends that two legs of drilling be devoted to sedimented ridges in the 1991-1992 time frame.

SRDPG concluded that PCOM needs to clearly identify responsibilities, funding and a timetable for the high-priority drilling and logging developments required for high-temperature drilling, both at the EPR and at sedimented ridge crests. SRDPG, LITHP and DMP have made several recommendations on which PCOM can act. These include: 1) LDGO Borehole Research Group be given responsibility for developing high-temperature logging capabilities for ODP, while TAMU should have responsibility for high-temperature drilling systems; 2) The $300K now allocated for tool hire in FY91 and FY92 should be redirected for the development of high-temperature logging capabilities; 3) The Barnes-Uyeda tool be modified for higher temperatures (up to 200°C) and made stronger; 4) A slimline self-contained probe be developed or acquired to measure temperatures up to 350°C; 5) A combination logging tool be developed for use in conventional diameter holes (possibly using a modified side-entry sub to cool the hole while logging) to incorporate as many measurement requirements of SRDPG and LITHP as possible (temperature, fluid resistivity, formation resistivity, natural gamma radiation, sonic velocity, caliper, flow velocity, and borehole fluid pressure in order of priority); 6) A method of hydrologically sealing reentry holes be developed to monitor *in-situ* temperature and borehole fluid pressure as the hole re-equilibrates.

The approach of a working group to define objectives followed by a detailed planning group, as used for sedimented ridges has been very successful. The SRDPG has completed its job and should now be dissolved. A watchdog group is needed, however, to monitor progress on the engineering developments required for these legs and to review new site survey data as it becomes available. The SRDPG recommends this *ad-hoc* watchdog group consist of the four Sedimented Ridge Crest Co-Chief Scientists and a PCOM representative.

Discussion

Brass asked why it was important that the second leg of drilling fall within the 12 to 18 month period following the first leg. Detrick said that if the time period between the legs is too long, the venting may stop, but there must also be a period of time to learn from the first leg, which locations are best to drill on the second leg. Leinen asked if there were only one leg, would that translate into a choice of a hydrology vs. a sulfide program. Detrick said that the inter-dependent two-leg approach is the best for studying these problems. Leinen asked why two different sites were chosen for the sulfide drilling. Detrick said that the DPG wanted the drilling effort concentrated in one area if possible, but in order to study both the temporal aspects of the deposits and other controls such as sediment interaction and volcanic intrusions, two different types of deposits need to be studied. Brass asked if Middle Valley is the best place in the world to study these processes. Detrick said it was the opinion of the Sedimented Ridges Working Group that this is the best place, at this time, to study the hydrological aspects. The sulfide studies need to be done in a number of different settings, but the best combined study of the relationships between sulfides and hydrology will be in Middle Valley. Dalziel asked what is known about the tectonic controls on the hydrological systems. Detrick said that there appear to be some tectonic controls but the present seismic imaging is insufficient to understand them. Batiza said that LITHP has given its full support to the two-leg drilling program planned by the SRDPG. Suess said that SGPP has also given its full support. SGPP thinks sampling of fluids from the borehole is critical and also endorses the development of the plug for the reentry cone. Moberly said that natural laboratories such as the ones proposed for the Sedimented Ridge program were endorsed by both COSOD I & II, and committing ODP to two legs of drilling at this location is appropriate.

Chile Rise Triple Junction

The Chile Rise Triple Junction program will examine the intersection of the Chile Ridge with the Chile Trench. Drilling sites are designed to decipher the nature of the intersection of the ridge axis and the margin and to examine the margin both before and after its intersection with the spreading center. The Prospectus Update includes the new data gathered in that region and will be included in the Third Prospectus. The entire Chile Rise Triple Junction program including the pre- and post-collision aspects and fluid studies, will require two full legs of drilling to complete (estimates are about 105 days plus transit time). The most optimum way to design the drilling program is two back-to-back legs. TECP has given this program its highest rank. The best weather window for this program appears to be between December and April, but others suggest that it might be drilled at any time during the year. Clearances will not be a problem.

Discussion

Taira asked what the most important processes that will be studied at this location. Dalziel said that the processes associated with subduction of a ridge crest will be most important. Ridge crest subduction has has a profound effect on the evolution of the Western America Cordillera and may also be related to the breakup of super-continents. Many processes are related to ridge crest subduction including: horizontal compression, stress in the upper plate, high thermal gradients, tectonic erosion, large vertical motions, anomalous trench volcanism, ophiolite emplacement, etc. Taira asked what the focus of the study would be. Dalziel said that TECP has endorsed two legs, with the first devoted to the zone of present ridge collision and the second on the history of the margin before and after the collision. Austin observed that this is probably the best site in the world to study the processes associated with ridge subduction. Cowan expressed a concern that hydrothermal aspects were ignored in the present proposal. Kastner agreed that fluids deserve more attention. [Note: Fluids are an objective of the revised proposal submitted just after the PCOM meeting and have resulted in a high ranking by SGPP.] Brass asked if this location would be a good place to look at the problem of the driving mechanisms of plate motions using stress measurements. Dalziel said this was true. Shackleton suggested that the top part of the sections should be cored with the APC rather than the RCB.

Eastern Equatorial Pacific Neogene Transect

Two transects of hydraulic-piston-cored holes will be placed to obtain continuous undisturbed sedimentary sections for studies of paleoceanography of the Late Cenozoic in the eastern equatorial Pacific Ocean. The proposed sites focus on the evolution of climates when the earth changed from an essentially non-glacial world to one dominated by extensive glaciation in the high latitudes. The objective of paleoceanographic measurements along latitudinal gradients represents a long-standing theme of the former SOHP and is highly ranked by the present OHP.

Knowledge of the development and the evolution of the equatorial circulation system in the eastern equatorial Pacific during the late Cenozoic is still limited. Previous sites have been located along east-west transects and have failed to monitor north-south shifts of the complex equatorial current system. Furthermore, existing holes are located in areas of reduced sedimentation with many hiatuses and lie at similar water depths, making it impossible to resolve vertical changes of the water mass.

The results of the cruise of Pisias and co-investigators to map, profile and piston core the proposed drilling sites along the latitudinal profiles at 110°W and 95°W have significantly strengthened this program. The changes have been incorporated into a revised prospectus chapter.

Discussion

Kidd said the site survey package is generally in good shape, but there is a concern with the watergun records for WEQ-2 (48 m thickness of sediments) which are virtually useless. Basement depths are poorly constrained. SSP suggests that the *Resolution* collect 3.5 kHz profiles as it approaches the drilling sites.

Leinen said that there is some question about the drilling time estimates. The time requirements may be too optimistic and one of the sites might have to be dropped if they are wrong. Elimination of the requirement of a third APC core, which is dictated by the present sampling policy, would save time. Moore said that IHP will make exceptions to the sampling policy when the scientific requirements are spelled out in the cruise prospectus. The ODP sampling guidelines are designed to protect the cores for scientific studies.

Leinen also pointed out that the time required for logging is inflated by the addition of stress measurements in basement using the BHTV, something that was not included in the original proposal. Jarrard said that the logging policy, concerning stress measurements, is to make them in targets of opportunity when recommended by TECP. It was suggested that a proposal may be necessary to justify these measurements when they require an additional two days per site. Dalziel said that TECP will need to discuss this matter to decide how important a stress measurement would be in this location. Kastner said that there is a difference between a target of opportunity and creation of the opportunity, and in this case the measurements may jeopardize the success of the leg. Moberly said that conventional logging should be done for this leg. The stress measurements need to be justified by a proposal and not endanger the success of the main objectives of the leg.

EPR Bare Rock Drilling

The investigation of magmatic and hydrothermal processes at mid-ocean ridge crests as part of the broader problem of crustal generation is an important thematic objective of LITHP. The East Pacific Rise displays many signs of vigorous hydrothermal activity and shows well-developed axial seismic reflectors interpreted as axial magma chambers. Thus the study of the high-temperature reaction zone above a magma chamber can best be done in the axial region of the East Pacific Rise. A drilling strategy for addressing the scientific objectives outlined above requires a suite of eight holes. There are two competing proposals for this program on the EPR, one focussed in the vicinity of 12°50'N and the other set near 9°40'N. Site surveys appear to be adequate for either location. A DPG needs to be formed to choose between the competing proposals so that the guidebases can be placed during early 1991 on the Engineering III leg.

Discussion

Batiza said that the EPR Working Group established the strategy and criteria to be used for selecting and planning drilling on the EPR. LITHP endorses the formation of a DPG to make the choice and do the detailed planning. Kastner said that the DPG should include proponents of both sites. Kidd said that SSP is waiting to see the data for the two areas, but it should be adequate.

Lower Crust at 504B

A primary objective of JOIDES and the Ocean Drilling Program is to core as deeply as possible beneath the ocean floor to constrain seismic and petrologic models of the structure and evolution of the oceanic crust. At the present time, the highest ranked program of LITHP is deepening Hole 504B through the oceanic layer 2/3 transition into layer 3 gabbros. Without remedial work, scientific drilling cannot continue at Hole 504B. Part of an engineering leg is required to clean out and recase 504B. The engineers have decided that an attempt to mill and fish the junk in the hole will be the most efficacious method of cleaning the hole. The engineers say that they will know within the first 10 days of operations if the fishing will work. The bottom of the hole will be cemented and then milled. A new hole can be drilled in 37 days with no coring, but LITHP has said that another site should be considered before redrilling at Site 504. Time estimates for engineering operations at 504B and at the EPR are around 79 days at sea. Current operational plans are to divide the leg into a part A at Site 504B and a part B at the EPR. From the end of Leg 135 (Lau Basin) until the start of the next science leg (Leg 137) about 92 days will pass without scientific drilling. This is due in part to the long transit time (~16 days) to Site 504B from Papeete following Leg 135 and the necessity of a port call in Panama during the engineering operations.

Discussion

Detrick asked if the DCS works for drilling and recovering fractured rocks on Leg 132, why not start the scientific drilling on the EPR instead of having an engineering leg? Storms said that even assuming everything works successfully on Leg 132, more time will be needed on the third engineering leg to test drilling deeper into fractured rocks and to test high-temperature drilling equipment. Time must also be devoted to setting two hard-rock guidebases and drilling the BHA into bare rock to start the holes for the DCS.

823 Drilling Plans for 1991

At the Spring PCOM meeting in Oslo PCOM voted to schedule the ship track for 1991 from among the following list of programs given high priority by the thematic panels: Cascadia Accretionary Prism; Chile Triple Junction; Eastern Equatorial Pacific Neogene Transect; East Pacific Rise Bare Rock Drilling; Hydrothermal Processes at Sedimented Ridge Crests; and Lower Crust at Site

504B. Because of unexpected transits to the dry-docking of the *Resolution* in Singapore and some other delays the ship will not arrive for Engineering III at Site 504B in the Eastern Pacific until sometime in March 1991, much later than planned. PCOM had intended to schedule 10 months of scientific drilling from these six programs. PCOM has also committed itself to global thematic planning after 1992. It was noted many times during this meeting that the lack of sufficient long-range planning is beginning to have serious repercussions for ODP. Therefore after a prolonged discussion about the time period for which PCOM should be planning the ship track at this meeting, the following motion was passed.

PCOM Motion

PCOM will schedule legs through the end of calendar year 1991. PCOM acknowledges the earlier commitment to global planning after 1991, but the immediate need for technical developments (i.e. high-temperature, slimhole tools) makes it prudent to plan tentative additional legs through the spring of 1992. PCOM will evaluate these tentative legs at the April 1990 meeting based on the global drilling priorities from the thematic panels. (Motion Leinen, second Brass)

Vote: for 16; against 0; abstain 0

At its 1990 Annual Meeting PCOM will also re-evaluate the schedule when it formulates the FY92 Science Plan.

The readiness of the six programs in terms of tools needed for successful drilling or scientific measurements was reviewed. Cascadia, Sedimented Ridges Leg #1, Chile Triple Junction, and Eastern Equatorial Pacific Neogene have the necessary tools. EPR Bare-Rock drilling requires successful development of the DCS and high-temperature slimhole logging tools. Drilling at 504B requires that the hole be cleaned of junk. The desirability of scheduling drilling at 504B and the EPR in view of the questions about their readiness for drilling was discussed. PCOM has previously committed the *Resolution* to an Engineering Leg to prepare for drilling at 504B and the EPR as soon as the ship comes to the Eastern Pacific in 1991. Scheduling of drilling at 504B or the EPR should be done as soon as practical after the Engineering Leg. Jarrard said that this should not be any earlier than July 1991 to have any hopes for tool development. These legs need to be scheduled simply to ensure that money will be allocated for the necessary tool development. Since the drilling at 504B and the EPR has been such a long-standing priority of LITHP and in addition ODP has spent considerable funds to develop the technology in preparation for this drilling effort, PCOM agreed that drilling of at least one of these programs should occur in 1991. PCOM next discussed the merits of Cascadia vs. Chile Triple Junction. There was no strong consensus that one program was better than the other; both would appear to require two legs of drilling; both require some additional detailed planning; they are both appealing to TECP and SGPP and to wider earth science communities. Taking

into consideration the rankings of the thematic panels, weather windows, transit constraints and tool development schedules, PCOM passed the following motion.

PCOM Motion

PCOM schedules the following legs for drilling in calendar year 1991: Hydrothermal Processes at Sedimented Ridges I, Eastern Equatorial Pacific Neogene Transect, Lower Crust at 504B. In the event that Lower Crust at 504B cannot be drilled, East Pacific Rise Bare Rock Drilling will be substituted. (Motion Leinen, second Brass)

Vote: for 14; against 2; abstain 0

The Science Plan for the FY91 Program Plan will include the purposes, sites, and drilling plan for each of these legs, as developed by the appropriate DPG.

Because there is an immediate need for technical developments (i.e. high-temperature, slimhole tools), PCOM tentatively planned additional legs through the spring of 1992 which will be re-evaluated at the April 1990 PCOM meeting based on the global drilling priorities from the thematic panels.

PCOM Motion

PCOM tentatively schedules the following legs for drilling after Lower Crust at 504B: 2 legs of drilling at Chile Triple Junction, East Pacific Rise Bare Rock Drilling I, Cascadia Accretionary Prism I, and Hydrothermal Processes at Sedimented Ridges II. (Motion Leinen, second Mevel)

Vote: for 13; against 1; abstain 2

824 Planning Requirements for 1990 Meetings

The JOIDES Office prepared the following as a basis for PCOM discussion and decisions.

1. Spring meeting

- Review of procedures involving PCOM, JOIDES Office, thematic panels and DPGs.

  The main purpose of the 24-26 April meeting is for PCOM to decide the general direction of the vessel for the 4-year period to spring 1994.

  Therefore by 10 April PCOM members must receive in their Agenda briefing books annotated lists by each of the four thematic panels of their current ranking of programs.

  Therefore by 3 April the JOIDES Office must receive the lists from the thematic panels.

  Therefore in winter no later than mid-March the thematic panels will have had to (a) review new as well as appropriate older proposals from

any ocean, in terms of published thematic objectives and the probability of actual drilling (related to the scientific and technical maturity of a proposal, including existing or anticipated surveys, engineering developments, safety, and perhaps other factors), (b) assemble the thematically acceptable proposals into programs, (c) rank and list the programs, and (d) briefly annotate each program with its thematic objectives and other appropriate comments to guide PCOM.

At their late winter meetings, thematic panels will also have the opportunity for panel-wide comments of the November 1989 updated CEPAC-DPG prospectus.

- Is this satisfactory and clear? * Does PCOM want to adjust any part?

2. **Summer meeting**

- Agreement on procedures involving PCOM and possibly other parts of the JOIDES structure.

  One important purpose of the 7-9 August meeting is preparation for the 1990 Annual Meeting at which the FY92 drilling program will be set.

  Therefore PCOM should receive and discuss watch-dog reports, DPG reports, reports from the co-chairs of the liaison groups to other international geoscience programs and other information pertaining to possible candidate programs for FY92 drilling. Presumably, programs that might be in regions visited by the ship early in its 4-year general progress would be examined most closely, but even the potentially later ones must be discussed.

  Therefore at its April meeting, as soon as PCOM sets the 4-year general direction, PCOM must assign its watch dogs for each highly ranked program likely to be a candidate in the 4-year period.

- Watch dogs: After considering carefully the purposes and dates of the various meetings it appears to the PCOM Chairman that reports of its own watch dogs are most needed at the August meeting. An exception is the set that should have been presented this morning (at this present meeting) to assist the evaluations of the candidate programs for easternmost Pacific drilling in FY91. Under routine business tomorrow, watch dogs of the former WPAC and CEPAC regions can up-date us on the status of those programs. If we are, however, pressed for time the PCOM Chairman will request that these be quite brief or even eliminated.

  In the case of the April meeting it seems presumptuous to guess in advance that the weight of high-ranking programs will indeed be in the Pacific where we have watch dogs. The majority of our mature proposals are there; we have heard from our panels that many highly ranking themes can best be addressed in the Pacific; and through FY91 we will not

have completed a minimum of 18 months of scientific drilling in the CEPAC region. Nevertheless, in fairness we point out that our notice to the community was that the direction of the vessel after 1991 will be based on thematically reviewed proposals from any ocean, we will not have the annotated rankings of programs by panels until April, and almost certainly we will not have assigned watchdogs to all of the high-ranked programs.

Therefore the Chair recommends that April watch-dog reports be given late in the meeting, after the decisions about the 4-year general direction of the vessel.

The Chair also recommends, that in April after the 4-year decisions, watch dogs be assigned to all high-ranking candidate programs not already covered. All watch dogs should be prepared to report at the August meeting.

3. **Annual Meeting**

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

  One important purpose of the 26-29 November meeting is preparation of the Science Program (drilling plan) for the FY92 Program Plan.

  Therefore PCOM members must receive within early November 1990 the equivalent of a "prospectus", with several candidate programs for FY92 presented in leg form with their objectives, thematic-panel comments and rankings, and wherever possible, their specific sites, drilling and logging times, and whatever else is needed for PCOM's evaluation and decision.

  The prospectus should include programs (and perhaps a candidate engineering leg) totaling about 7 to 10 legs, from which 6 will be selected for FY92. The prospectus should have received thematic-panel review and comments before the November Annual Meeting.

  Therefore PCOM (a) at this present meeting should decide how the prospectus will be prepared and what group or groups will be responsible to prepare it, and, (b) at its April meeting after knowing what the range of possible candidate programs will be, should establish and charge the group(s) to prepare it.

- Preparation of prospectus for 1990 Annual Meeting.

  Some possibilities are:

  If the general direction of the ship will be only in the Pacific in the early part of the 4-year period, CEPACDPG can be asked to prepare the prospectus. The DPG will need some augmentation (or proper replacement of retiring members) for such a task.

advantages: CEPACDPG exists; most of its prospectus is already up to date.

disadvantages: CEPACDPG not be well constituted for a 1992 theme-driven program. No preparation for the eventuality that sooner or later the ship will be elsewhere (Atlantic, Western Pacific, or wherever).

If the direction is outside or largely outside the Pacific, the CEPACDPG might be dissolved or inactivated, and an appropriate new DPG formed (perhaps with some transferred CEPAC personnel). Its title might be non-regional ("1990 DPG") or it could indicate the general direction that was selected (for example, "South Atlantic-Southern Ocean DPG").

advantage: By the proper rotation of personnel and periodic changes in title, this could become an open-ended, long-term DPG (corporate memory; efficiency, etc).

disadvantage: Difficult to have a single group of efficient size that would have the regional plus thematic expertise, and not be merely advocates of the members' own proposals. Generally difficult to assemble altruistic volunteers.

If there are mixed kinds of detailed planning, the JOIDES Office might assemble a prospectus. For example, collect within one volume (a) the reports of a number of program-specific DPGs that must be established, (b) the applicable parts of any existing prospectus, (c) appropriate panel and working-group reports, (d) and single-site legs like 504B that would need little additional attention. At the minimum, there are the proposals themselves and the notations with the thematic-panel rankings.

advantages: Truly detailed planning will mainly be performed by one-time DPG meetings of the most-competent persons. The JOIDES Office can have good knowledge at all times of the status of the various parts of the prospectus.

disadvantages. Unevenness of contributions. Additional workload on JOIDES Office (but summer is the lightest time)

Combinations of the above (CEPAC-DPG, other DPGs, direct thematic input, etc., assembled perhaps by a 1990 DPG or perhaps by JOIDES Office)..

advantage: Least effort

disadvantages: Lack of coordination; unevenness of contributions.

* As a point for discussion and action, the Chair recommends that PCOM now adopt the concept that it will, before adjournment in April, establish, fill, and charge new DPGs appropriate for those programs needing detailed planning before the Annual Meeting. PCOM will also charge the JOIDES Office to prepare a prospectus for the highly ranked programs and general direction of the vessel for the early part of the 1990-1994 period.

* For discussion purposes, the Chair presents but does not recommend the alternative: that PCOM now adopt the concept that it will, before adjournment in April, establish, fill, and charge a new DPG appropriate to prepare a prospectus for the highly ranked programs and general direction of the vessel for the early part of the 1990-1994 period.

Discussion

Leinen said that because of the heavy burden placed on the thematic panels, both to review proposals and to prepare global thematic rankings, the panels should have the option of extending their winter meetings to help them get their information in shape. Tucholke agreed that they may need more time to accomplish their tasks. Brass said that the 4 thematic panels must send PCOM in the fall a list of their top ranked programs. Moberly said that this number should not exceed 4 or 5. Austin said that this will translate into many legs of drilling. Leinen said that the number should remain small so that ODP drills the best programs.

Austin said that PCOM must appoint some DPGs at this meeting to plan for drilling at Cascadia and the EPR, and perhaps some working groups also need to be formed to establish directions for certain kinds of drilling such as accretionary prisms. von Rad said a workshop on conjugate passive margins is important. Moberly said that workshops might be the appropriate setting for establishing directions for future ODP drilling.

Kastner thought that it would be appropriate for the JOIDES Office to prepare a prospectus for the potential drilling programs. von Rad said that a prospectus is very important and thought that it should be prepared by a small panel. Batiza suggested that a DPG is the best way to get realistic programs in the prospectus. Moberly said that the DPG could be formed to meet only once to establish the prospectus for that year's PCOM Annual Meeting. Austin was concerned that these will appear to be regional panels. Moberly said that it is possible that the drilling might be in more than one ocean. Batiza said that the group should be multi-disciplinary and not regional in its scope. Rea said that staffing is critical and it is important to have regional expertise when putting together a prospectus. Another critical factor in putting together a prospectus is to have a limited number of good proposals.

The general consensus of PCOM was that after establishing the general 4-year direction for the *Resolution* at the Spring PCOM meeting, a DPG will be formed to prepare a prospectus for the next fiscal year of drilling. If the general direction is in the Pacific, then the nucleus of the DPG will be formed from the CEPAC-DPG with appropriate additions as necessary. If the direction is elsewhere, then an appropriate DPG will be formed. In either event, the prospectus should contain more programs than can be accommodated by 5 to 6 legs of drilling to ensure competition for the selection of the best drilling

programs. The DPG will have to meet in sufficient time for the thematic panels to review, comment, and make program-rankings of the prospectus at their fall meetings.

PCOM thanked Dave Rea, Bob Detrick and the members of their respective DPGs for their efforts during 1989.

Thursday, 30 November 1989

825 Meeting of Former IOP and Co-Chief Scientists

At the Annual Meeting in Miami last year, PCOM committed itself to a final meeting of the Indian Ocean Panel (IOP) and Indian Ocean Drilling Leg Co-Chief Scientists. The JOIDES Office failed to interest the last chair of the IOP to organize a meeting. At the Woods Hole meeting, a 5-person *ad hoc* Indian Ocean sub-committee (R. Duncan, R, Kidd, D. Rea, U. von Rad, J. Weissel) recommended and PCOM accepted the following suggestion for the convening of the meeting. The purpose of this meeting would be to: 1) discuss and synthesize the results of the nine-leg Indian Ocean Drilling Program in light of COSOD I objectives; 2) assess both the successes and short-falls of this drilling; 3) emphasize unexpected achievements; and 4) highlight the direction for future studies. A further purpose is to assemble synthesis and review papers for publication as a volume outside of ODP. Attendance at the meeting will include former IOP members, Indian Ocean Co-Chiefs and selected shipboard participants. The location and time of the meeting will probably be at the University of Cardiff (Wales) in June 1991, in conjunction with a planned meeting of UK Indian Ocean Participants, which will be hosted by R. Kidd. The format for the meeting will be limited summary talks and posters, plus draft manuscripts from participants, all organized along thematic lines. Participants will work on jointly authored papers on multi-leg subjects. These papers will be submitted to the conveners within 6 weeks of the end of the meeting. AGU will be contacted to publish the volume and asked to supply editorial and reviewing assistance. It is hoped that these publications can be done as part of a monograph series on Ocean Drilling. Funds for organizing the meeting, some editorial assistance, and for the travel of US participants will be sought from USSAC. Other member countries would have to support participation by their respective IOP panel members, Co-Chief Scientists, and any other participants.

Discussion

Austin thought this was a good idea for all the regional panels and suggested that the former Western Pacific Panel chairman B. Taylor be asked to start planning a similar meeting.

Kastner suggested that a summary of the meeting be prepared for EOS; Moberly suggested Geotimes and Episodes and Brass suggested Nature as well.

von Rad said that a 10 page overview of the drilling would be helpful for ODP as a whole.

Brass said it is time that ODP consider committing to a Monograph Series, and he will undertake exploration of this possibility with AGU. The publications can be along both thematic and regional topics.

Duncan said that for the IOP meeting, an editor for the volume will have to step forward. For the present, Duncan volunteered to be the point of contact for getting the meeting organized. He will supply a letter requesting the meeting and Moberly will approve the meeting. Other arrangements concerning funding will have to worked out with JOI/USSAC.

826 Resolution Regarding Soviet Participation in ODP

Because of concerns expressed previously about problems being caused for the non-US partners by the exclusion of the Soviets from ODP, a sub-committee consisting of Brass and von Rad volunteered to draft a resolution (see Minute 815). The following motion and resolution was approved.

PCOM Motion

PCOM adopts the following resolution. (Motion Brass, second Kastner)
Vote: for 16; against 0; abstain 0

PCOM Resolution

The JOIDES Planning Committee recommends scientific and technological goals for the Ocean Drilling Program and includes representatives from each of the international partners and the ten JOI Institutions. The Committee has recently learned that failure to permit the Soviet Union to participate in the Ocean Drilling Program has begun to cause difficulties for scientific cooperation in other non-ODP programs. Marine Science is inherently international and relies on the cooperation of many nations and access to territorial seas of great scientific interest. The unilateral US decision to deny ODP membership to the Soviet Union who participated effectively in the Deep Sea Drilling Program, the ODP predecessor, has involved the international ODP members without consultation and without their concurrence. In recent months the Soviet Union has indicated that their rejection by the program inhibits their desire to cooperate fully in other international programs. The ODP Planning Committee urgently recommends that an invitation to join the Ocean Drilling Program be extended to the Soviet Union early in 1990.

[The resolution was immediately forwarded by EXCOM Chairman Charles Helsley to Dr. Eric Bloch, Director of NSF, and to Dr. Allan Bromley, Assistant to the President for Science and Technology. A positive response has been received from Dr. Bromley. In his letter Bromley states that he agrees that it would be in the best interest of all concerned to have the USSR once again

participate fully in the drilling program and has communicated that conclusion to President Bush.]

827 Membership Changes on JOIDES Panels

PCOM has a general concern about ensuring that the JOIDES advisory structure is open to participation by all US Institutions. Therefore in the future PCOM admonishes all JOIDES panels to provide at least two nominees to cover each requested appointment and that these nominations should include "new blood". PCOM wants to see a balanced mixture of scientists in the advisory structure, including both scientists with experience in the Ocean Drilling Program and those that are new to the program. Membership on the various JOIDES panels was reviewed and the following actions were taken.

LITHP There were no requests for new members. A. Taira said that T. Fujii (Japan) will be going off the panel. LITHP should indicate what kind of expertise they would like, so that Japan can appoint an appropriate new member

OHP The panel had requested that a particular new member be appointed to replace both A. Droxler and member-at-large L. Mayer, with interests in both shallow-water carbonates and deep-ocean seismic stratigraphy. Because of concerns about appointment of a drilling proponent at this particular time, a decision was put off until the next PCOM meeting. A. Droxler and L. Mayer are asked to continue through the next meeting of OHP. The panel is requested to make more than one nomination to cover appointments in a particular expertise. Nominations of "new blood" are to be included in future requests. This applies to all panels. A. Taira said that T. Saito (Japan) will be going off the panel. Ken Konishi will probably be appointed (expertise in shallow-water carbonates).

SGPP Roger Flood is asked to join the panel to cover the area of deep-sea sedimentation. Jeff Alt is asked to join the panel to cover the area of crustal alteration. Martin Goldhaber is asked to continue his membership on SGPP for another year.

John Parkes of the Department of Geology, University of Bristol who conducted the microbiology experiment on the cores from Leg 128 will attend the next meeting of SGPP to discuss microbiology; Jenkyns said that his expenses will be covered by the UK.

M. Kastner suggested that the panel be allowed to have 16 members for one year, while it is still sorting out its mandate.

TECP Tanya Atwater is asked to join the panel to cover the area of plate kinematics. Casey Moore is asked to join the panel to cover the area of accretionary prisms.

DMP No action taken since the panel is still soliciting new nominations.

IHP No action taken. The appointment to IHP of two recent Co-Chief Scientists (a US and a non-US) was discussed. The Co-Chiefs would provide input to IHP on publication as well as other shipboard matters. This will be an Agenda Item for the next PCOM. Nominations of Co-Chiefs for this appointment are to be sought.

PPSP No requests and no actions taken.

SMP No requests and no actions taken. More visitors are needed to discuss problems with shipboard measurements.

SSP No requests and no actions taken. A. Taira said that K. Suyehiro (Japan) will be going off the panel.

TEDCOM Earl Shanks (Mobil) and Howard Shatto, Jr. (Consultant) are asked to join the panel.

PCOM Motion

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

Vote: for 16; against 0; abstain 0

Confirmations of PCOM Liaisons to upcoming panel meetings are:

LITHP - Duncan or Natland	IHP - Watkins
OHP - Brass	PPSP - Moberly
SGPP - Brass	SMP - Leinen
TECP - Tucholke	SSP - Watkins
DMP - Cowan	TEDCOM - Brass

828 Liaison Groups With Other Global Geoscience Programs

EXCOM has accepted the JOI and PCOM proposal for the formation of Liaison Groups with other international geoscience programs with the proviso that PCOM and EXCOM members shall not be members of the liaison groups. When the Co-Chairs attend PCOM meetings they will be treated as guests and will have to leave the room when sensitive matters are discussed. Wording for the mandate and terms of reference for the groups was presented and the following motion was passed.

PCOM Motion

PCOM recommends and forwards to EXCOM for approval the following proposed mandate and terms of reference for Liaison Groups.

1.1 Liaison Groups may be established between JOIDES and other international geoscience programs having a strong interest in ocean drilling.

8. Liaison Groups: Mandate. As a formal means of communications, and especially to facilitate the exchange of beneficial information, JOIDES may establish a Liaison Group with any international geoscience program that has a strong interest in ocean drilling. Such groups may be approved by PCOM on the nomination by JOI, Inc. For each Group, typically a Co-Chairman and one additional member will be appointed by an international program to represent it, although with mutual consent the membership of a Group may be larger. PCOM and EXCOM members will not be members of Liaison Groups. Typically, Co-Chairmen will be invited to meet with PCOM at the summer PCOM meeting.

(Motion Brass, second Watkins)

Vote: for 12; against 0; abstain 4

A formal response has been received from Bob Ginsburg of the Global Sedimentary Geology Program (GSGP) agreeing to form a Liaison Group. Ginsburg has forwarded the names of three GSGP representatives for this liaison group (Erle Kauffman Co-Chairman; David Bottjer; Michael Arthur). PCOM approved the following JOIDES members for this Liaison Group: Tim Bralower Co-Chairman (Alternates: Dave Scholl, Wyllie Poag, Robert Garrison) and Judy McKenzie,of the ESF (Alternate: Jurgen Thurow, FRG).

Although a formal response has been received from RIDGE concerning the formation of a Liaison Group, PCOM did not nominate any members because RIDGE is not yet an international program. When RIDGE does become international, JOIDES members will be named.

829 Nominations For Co-Chief Scientists

PCOM recommended Co-Chief Scientists for the following drilling legs:

Eastern Equatorial Pacific Neogene Transect

US Co-Chief	1. N. Pisias
	2. A. Mix
	3. M. Lyle
	4. R. Embly
Non-US Co-Chief	1. L. Mayer (C-A)
	2. T. Pederson (C-A)
	3. H. Beiersdorf (FRG)

Hydrothermal Processes at Sedimented Ridge Crests

US Co-Chief
1. M. Mottl
2. R. Zirenberg
3. M. Langseth
4. J. Morton

Non-US Co-Chief
1. E. Davis (C-A)
2. F. Albarede (France)
3. J. Cann (UK)
4. H. Baecker (FRG)

PCOM adjures that a balance be maintained between the expertise of the Co-Chiefs such that if Davis is chosen, the ideal pairing would be with Mottl, Zirenberg or Morton. Similarly if Mottl is chosen the ideal pairing would be either Davis or Baecker.

Lower Crust at 504B

US Co-Chief
1. J. Alt
2. H. Dick
3. K. Becker
4. J. Sinton
5. S. Humphris
6. M. Mottl

Non-US Co-Chief
1. J. Erzinger (FRG)
2. J. Honnorez (France)
3. J. Kinoshita (Japan)
4. R. Emmerman (FRG)

PCOM adjures that a balance be maintained between the expertise of the Co-Chiefs.

East Pacific Rise Bare-Rock Drilling

US Co-Chief
1. C. Langmuir
2. R. Detrick
3. D. Fornari
4. G. Thompson

Non-US Co-Chief
1. J. Francheteau (France)
2. J. Cann (UK)
2. R. Hékinian (France)
3. J. Erzinger (FRG)
4. F. Albarede (France)
5. H. Bougault (France)

830 Formation of Cascadia and EPR Detailed Planning Groups

Based on the recommendations of various panels, PCOM established a Cascadia Accretionary Prism Detailed Planning Group and an East Pacific Rise Detailed Planning Group.

PCOM Motion

PCOM establishes a Cascadia Accretionary Prism Detailed Planning Group and an East Pacific Rise Detailed Planning Group. (Motion Brass, second Leinen)

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

PCOM made the following nominations and mandates for the two DPGs.

Cascadia DPG

Non-Proponents
L. Cathles (US) 1st Choice for Chairman
G. Westbrook (UK) 2nd Choice for Chairman
J. Behrmann (FRG)
S. Dreiss (US)

Vancouver Proponents (3 of 4) to be chosen
R. Hyndman (C-A)
V. Wall (C-A) [Aussie Alt. for Hyndman on FPAP, proponent?]
B. Bornhold (C-A)
C.J. Yorath (C-A)

Oregon Proponents (3 of 4) to be chosen
V. Kulm (US)
G. Moore (US)
B. Carson (US)
E. Suess (FRG)

PCOM Liaison: NEEDS TO BE APPOINTED

Only one member from the FRG should be appointed. Other non-US members may appoint members to the DPG if they wish, but it is suggested that they avoid proponents in order to maintain a balance.

Charge to the Cascadia DPG
The DPG is to examine the competing Cascadia Accretionary Prism drilling proposals and provide a prioritized plan for drilling. If the highest priorities cannot be accomplished in one leg, the DPG should make suggestions for later drilling.

[L. Cathles has accepted the chairmanship of the DPG. The proponents have recommended that the membership include the persons with the greatest overall knowledge of the scientific objectives and of the data. Thus the three

Vancouver proponents will be R. Hyndman, E. Davis, and M. Brandon, and the Oregon proponents will be V. Kulm, C. Moore and B. Carson.]

East Pacific Rise Bare Rock Drilling DPG

Non-Proponents
E. Davis (C-A) 1st Choice for Chairman
P.J. Fox (US) 2nd Choice for Chairman
J. Delaney (US)
R. Von Herzen (US)
ODP-TAMU Engineer (S. Howard suggested)

9°40' N Proponents
D. Fornari (US)
K. Macdonald (US)

12°50' N Proponents
J. Francheteau (France)
R. Hékinian (France)

PCOM Liaison: J. Natland

Other non-US members may appoint members to the DPG if they wish, but it is suggested that they avoid proponents in order to maintain a balance..

Charge to the East Pacific Rise DPG
The DPG is to choose which of the two active proposals for the two areas on the East Pacific Rise, at 9°40' N and 12°50' N, best meets the criteria established by the EPR Working Group. The DPG is then to fix the drilling template to the actual sites and prepare a drilling plan.

[E. Davis accepted the chairmanship of the DPG on the condition that a full-range of the necessary expertise be provided. Moberly has approved the following additions to the membership: K. Van Damm, non-proponent; M. Purdy, 9°40' N proponent; F. Albarede 12°50' N proponent. The DPG is scheduled to meet 5-7 April 1990 in Vancouver.]

PCOM Motion

PCOM accepts the slate of members and mandates suggested for the Cascadia Accretionary Prism Detailed Planning Group and East Pacific Rise Detailed Planning Group. (Motion Brass, second Watkins)
Vote: for 16; against 0; abstain 0

830 Miscellaneous Business

PCOM Motion

PCOM adopts the following resolution. (Motion Watkins, second Kastner)
Vote: for 16; against 0; abstain 0

PCOM Resolution

The JOIDES Planning Committee receives with sadness the news of the death of F.G. Walton Smith, one of the founders of JOIDES and first Dean of the University of Miami's Rosenstiel School of Marine and Atmospheric Science. The Planning Committee extends their sympathies to Walton Smith's family, friends and colleagues.

The following statement was read into the Minutes by U. von Rad for consideration by PCOM and IHP:

PCOM is concerned about the fact that some of the recent Scientific Results volumes of the Proceedings of the Ocean Drilling Program will not contain synthesis chapters from the Co-Chief Scientists. Without these summary chapters a very important part of the most visible results of ODP will be lost to the general detriment of the program. It is therefore requested that TAMU urge Co-Chief Scientists to include summary papers and apply as much flexibility as possible (e.g. acceptance during the paste-up stage) to allow co-chiefs to write these papers after their editorial duties have been finished, with the provision that the accepted publication deadlines are not compromised.

This topic will be an Agenda Item at the next PCOM meeting.

831 Future Meeting Schedule

The next meeting will be the 1990 Spring PCOM meeting to be held in Paris France from 24-26 April, 1990. A two-day field trip down the Rhone Valley is planned to follow the meeting.

The 1990 Summer PCOM meeting will be hosted by Scripps in La Jolla from 14-16 August 1990. There will not be a joint meeting of US PCOM members with USSAC.

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

The 1991 Spring PCOM meeting will be hosted by the University of Texas at the Thompson Conference Center on the Austin campus from 23-25 April 1991.

The 1991 Summer PCOM meeting will be hosted by the FRG in Hannover from 20-22 August 1991. There will be a field trip after the meeting.

The 1991 Annual PCOM meeting will be hosted by the University of Rhode Island from 4-7 December 1991. The PCOM meeting will be preceded by the Panel Chairmen's meeting on Tuesday, 3 December.

832 Conclusion of the Meeting

The Planning Committee thanked Brian Tucholke for his efforts towards making this meeting both productive and enjoyable. Thanks were also forwarded to the Director, Craig Dorman, as well as Janet Johnson and others at Woods Hole Oceanographic Institution.

This was the last meeting for Miriam Kastner since she is stepping down from PCOM. The Planning Committee expressed its appreciation of her efforts on the behalf of ODP by acclimation.

The 1989 PCOM Annual Meeting adjourned at 2:00 PM.

Meeting of the Sedimentary and Geochemical Processes Panel
University of California, Santa Cruz, U.S.A.
14-16 January 1990

Executive summary

The main focus of the meeting was (1) the ranking of all proposals received by SGPP towards a post-1991 drilling schedule; secondary tasks were (2) yet another revision and expansion of the SGPP white paper, (3) the status of position papers on technology and sampling issues.

Ranking of drilling proposals

SGPP considered more than 50 proposals for post-1991 drilling; these were initially grouped into and prioritized within the five SGPP themes: **(1) Sea level; (2) Fluids & gases; (3) Metallogenesis & hydrothermalism; (4) Sediment & mass balances; and (5) Paleocean-chemistry/paleoceanography.**

Fourteen proposals remained for the final discussion; these were ranked by comparing the thematic objectives of the top proposals among each of the five themes while maintaining the priority within each theme. This procedure resulted in the following ranking:

1 Cascadia margin: #233, #237/E; 317/E rev
2 Chile Triple Junction: #318/E, 362/E rev
3 Atolls and Guyots: #203/E, #335/E rev
4 Sedimented ridge crests-II: #272/F, #284/E, #290//E
5 New Jersey margin: #348/A
6 Peru gas hydrates: # 355/E
7 East Pacific Rise bare-rock: #321/E, #357/E rev
8 Gulf of California hydrothermalism: #275/E rev
9 New Zealand margin: #337/D
10 Barbados accretion: #342/A
11 TAG area hydrothermalism: #361/A
12 Northern Juan de Fuca bare-rock: #325/E
13 Nankai-II: #314/D
14 Valu Fa Ridge: #360/D

Other proposals which are not presently included in the ranking because of deficiencies but are very likely to be ranked high include:

#330 Mediterranean Ridge
#332 Florida Escarpment
#250 Navy fan
#340 North Australian margin
252 Loihi Seamount
and Bering Sea.

Rationale for prioritization and final ranking are detailed in the minutes which follow.

Sedimentary and Geochemical Processes Panel
University of California, Santa Cruz, U.S.A.
14-16 January 1990

Minutes

In attendance were:

Name	Representing	E-Mail/ FAX
Erwin Suess, chairman	SGPP, GEOMAR, Kiel	E. Suess (494317202-293)
Jacques Boulegue	SGPP, U. P&M Curie, Paris	(33-143544097)
Nicholas Christie-Blick	SGPP, Lamont	(914-359-5215)
Shirley Dreiss	SGPP, UCSC	FRGSJD@UCSCD.BITNET (408-429-0146)
Roger Flood	SGPP, MSRC, SUNY	(516-632-8820)
Philip N. Froelich	SGPP, Lamont	P.Froelich (914-365-2312)
Martin Goldhaber	SGPP, USGS, Denver	(303-236-3200)
William W. Hay	SGPP, U. Colorado	(303-492-2606)
Makoto Ito	SGPP, Chiba U., Japan	(81-472518373)
Steve Macko	SGPP, Quebec U., Montreal	C1072@UQAM (514-987-3635)
Judith McKenzie	SGPP, ETH, Zürich	Sediment@CZHETHSA (004112527008)
Jürgen Mienert	SGPP, GEOMAR, Kiel	(49-431725391)
Dorrik A. V. Stow	SGPP, Southampton U., UK	(44-703593939)
William Normark	USSAC, USGS, Menlo Park	(415-329-5110)
Garry Brass	ODP, RSMAS, Miami	GW Brass (305-361-4632)
Marta von Breymann	ODP, Science, TAMU	MARTA@TAMODP (409-845-0876)
Margaret Delaney	OHP, UCSC	M.Delany (408-429-0146)
John Ladd	NSF, Washington	(202-357-7621)
Mitchell Lyle	Borehole group, LDGO, N.Y.	M.Lyle
Ralph Moberly	PCOM, JOIDES Office	Joides.Hig (808-949-0243)
John Parks	Bristol U.	(44-272253385)
Tom Pettigrew	ODP, TAMU	(409-845-7845)
Graham Westbrook	TECP, U. Birmingham	(44-214143971)

SGPP members absent:

Jeffrey Alt	SGPP, U. Michigan		(313-763-4690)
Henry Elderfield	SGPP, Cambridge U.	H. Elderfield	(44-223334748)
Frederick Prahl	SGPP, OSU		(503-737-2064)

Welcome

The first day of the meeting was called to order at 8:30 AM, January 14, 1990. The panel members and visitors were welcomed to Santa Cruz by Erwin Suess for the SGPP meeting hosted by Shirley Dreiss. The agenda for the three days was discussed with mention made of special topics of interest to SGPP: microbiological sampling, pressurized core barrel and drilling of coarse-grained sediments. These topics will be addressed by special guests attending the meeting. The minutes of the previous meeting at GEOMAR in Kiel, Germany, were discussed and approved. A comment was added that in the future reports to proponents of drilling proposals, more information would need to be provided on SGPP priorities.

Reports

Planning Committee

Ralph Moberly reported on the needs for PCOM upcoming meetings: Schedule of drilling for FY 1991 and preparation of a perspective on drilling in the Indian Ocean. It usually takes somewhere between 8 and 12 months to work such a plan through the system. The West Pacific program: drilling off NE Australia, Vanua Tu and the Lau Tonga back arc. This will be followed by an Engineering leg with two parts: the clearing of Hole 504B to prepare for future drilling at this site and the setting of bare-rock guidebases at two sites on EPR. The calender year 1991 will likely include a first leg of Hydrothermal processes, followed by Sedimented Ridges I, a Neogene transect on the east equatorial Pacific and the drilling at 504B. If the latter proves impossible (as would be determined during the Engineering leg), the EPR leg will be substituted. Additional legs, with emphasis on post-1991 will be discussed at the PCOM meeting in April, 1990. A general direction for the next 4 years will be decided which will likely include: (1) two legs on the Chile triple junction, (2) a leg on the East Pacific Rise (if this does not replace the 504B drilling as described above), (3) a Cascadia Accretionary Prism I leg, (4) a second Sedimented Ridge Crests leg and (5) Juan de Fuca.

The participation of the Soviet Union in ODP was discussed with the note that NSF will "keep on trying" to have this accomplished. Apparently there had been a "positive recommendation" and formal approval by the State Department been sought.

Two working groups have been established: an EPR Working Group and a Cascadia Detailed Planning Group. A sea level working group has been requested but has not presently been established. Three new drilling proposals have been received which are revisions of older proposals. A deep drilling meeting will be held in February, 1990, with long-range planning to be discussed. A representative from SGPP (Dorrik Stow) will attend that meeting.

Ocean History Panel

Margaret Delaney reported on the last meeting of the OHP which was involved with setting of panel priorities. It has been suggested that sea level may be a separate panel priority. The Neogene equatorial Pacific is the highest new priority for OHP. There has been a ranking by themes, which include the Neogene, Paleogene, Mesozoic, upwelling and sea level. At the next meeting there will be a discussion and ranking of the following proposals: 203, Guyots; 271 California Current; 305, Arctic; 320, Arctic; 326, NW Africa; 329, Cretaceous Atlantic paleocommunication; 313, Evolution of oceanic pathways; 335, Atolls; 336, Arctic; 337, Sea level architecture; 338, Sea level fluctuations; 347, South Atlantic; and 348, Mid-Atlantic.
Proposals for the Somali Basin, Bering Sea, and Deep Stratigraphic Tests were received but none for the Antarctic; also there may need to be a working group established for accretionary prisms.

Tectonics Panel

Graham Westbrook reported on the last panel meeting with an update on the proposals receiving interest. Passive continental margins have been discussed with consideration being made on type and development. There is support for the Chile Triple Junction. The Cascadia prism off Oregon seems to have better fluids objectives whereas the proposal to drill the Vancouver margin has better structural aspects. Pacific seamounts also have had interest in the panel. A preliminary ranking of proposals by TECP would be:

1) Chile Triple Junction (one leg)
2) Cascadia Leg I
3) East Pacific Rise
4) Sedimented Ridge Crests I
5) Cascadia Leg II
6) 504B
7) Sedimented Ridges II
8) North Pacific Neogene

Special Reports

John Ladd of NSF reported on some recent developments:
1) Details on a request for membership of the Soviet Union to ODP are being worked on.
2) There is initial work now being done on the post-1993 proposal for continuation of ODP. A long range plan of earth and ocean circulation systems will include fluid circulation, structure and composition of the crust and mantle, dynamics and deformation of the lithosphere, and variability of climate. It takes 5 to 6 years to develop a program, hence long-term planning is needed.
3) Issues which are receiving attention by NSF include tool development, new capabilities, i.e. Arctic and shallow water drilling, long-term experiments, and interaction with other programs. There is a need to develop interactions with major international programs.

Marta von Breymann of ODP/TAMU gave a short report on recent JOIDES Resolution drilling. The ship is finishing Leg 129 which had 3 sites, and has recovered material from the middle Jurassic. The logistics of doing radiotracer experiments in conjunction with microbial experiments on board are being considered; the possibility exists for having the ship votively and professionally checked for radioactive contamination (SWAP).

Mitchell Lyle of the Borehole Research Group gave a report on wireline logging which included the following highlights:
1) Wireline packer will be tested on Leg 131.
2) Borehole sampling will be attempted with the new tool.
3) Use of flowmeters was commented on in order to understand the dispersive properties and transport in hydrological settings. Two manuscripts on meters used in such research were distributed and are available from E. Suess upon request.
4) Work is being done on hot hole sampling with viewers, meters and tools to be tested. The possibility exists for sharing the tool with other groups apart from ODP.
5) Slim hole sampling has also progressed with ARCO donating tools which are to be tested on 132E.
6) Problems of determining magnesium by geochemical logging was discussed; the problems stem in part from the facts that oxidation states of other elements are not known, sensitivity is a problem and the geochemical data are made to add up to 100%.

Tom Pettigrew of ODP gave a report on the diamond coring system (DCS) to be used on LEG 132. The guidebase will be checked during a land test in Utah. It will then be tested on three drill sites during Leg 132. A "sacrificial" bottom hole assembly will be evaluated for bare-rock drilling.

Erwin Suess of SGPP repeated the annual panel report presented to PCOM. In summary some of the obligations of SGPP had been well-fulfilled, while others remained essentially untouched: (1) general operation of SGPP (about 80% accomplished) with regard to membership, proposal reviews and technology issues; (2) thematic reports (about 60% completed) on sand recovery, (3) the SGPP white paper (50% complete), fluid sampling, sea level and radioisotope use on the ship; (4) long-term planning (0%

completed) with work needed on topics of flow experiments, metamorphism, superlegs, and instrumented holes. Panel concerns were about final selection of drill sites in the Pacific and use of the pressurized core barrel Phase II. Strong SGPP interest were included in planning for Sedimented Ridge Crests and the Cascadia Accretionary Prism.
Details of the panel report were as follows:

OPERATION: 50% of the proposals received are of interest to SGPP (56 total proposals). Of these, 25% are ranked in group 1, 10% are ranked in group 2, 15% are in group 3 and 25% are in group 4. Panel expertise has been greatly increased by new members added as requested. Refinement of technical requirements (sand drilling, pore water protocol, pressurized core barrel-Phase II) are still on the agenda.

Improved sand recovery affects many groups and hence stirs a lot of interest; SGPP learned about developments. Fluid sampling is a high priority, SGPP needs to assure optimal analytical and sampling procedures. Sampling of high temperature fluids and use of instrumented holes needs to be addressed without further delay. The pressurized core barrel and avoidance of artifacts during porewater recovery need further treatment; options needed for this include controlled sampling, P-T stability, microbial experiment capability, titanium construction, record of thermal history, self-squeezer option, internal imaging possible.

The topic of sea level change is of multi-panel and multi-thematic interest; it ties ODP into Global Change and IGBP programs. A radioisotope policy needs to be established; SMP and DMP need to come up with one that considers experiments endorsed by SGPP including microbial studies and fluid flow measurements.

WHITE PAPER: The white paper received extensive discussion which ended with the conclusion that much of what the present version contains represents mandate and priorities. No drastic change is needs. Some overall introductory statements, clarifications and polishing are needed and will be incorporated prior to its release. Expansion of sections on budgets, fluxes, and technology issues received much attention as to the needs for corrections. These were worked on during the morning of day 2 of the SGPP meeting. A "new" version will be distributed by E. Suess after incorporation of all inputs.

CEPAC/DPG was reported on by Martin Goldhaber. Bare rock drilling and the Cascadia DPG were discussed. Both Cascadia proposals were commented on as to their scientific merits. The creation of the Cascadia DPG will sort these out and make suggestions to PCOM. The DGP should be composed of proponents of each proposal as well as a neutral group which would look out for SGPP interests. That group should have a SGPP member, who will see to the panel's interest including the geochemical objectives, the flow objectives, and the key experiments which will be proposed. The nature of the experiments should address the chemistry pathways and source of fluids. The Vancouver margin has a relatively simple flow regime with broad dewatering of the prism, not localized. No coring has been done there; the proposal contains a specific hypothesis to be tested. The Oregon margin has specific tectonic elements and a more complex fluid flux regime. The fluid flow is tied to specific parts of the system. Further comments and justification for drilling at these sites and the EPR are attached. Objectives and comments to PCOM for the DPG include:
1) Water budgets, lateral vs. episodic flow and transport regimes indicate that the DPG could develop a set of experiments to support the objectives which include open holes, sealed holes and reopened holes which have equilibriated.
2) Biological/geochemical consequences of cementation and lithification; use of tracers for rates of flow and depths of source including helium, methane, carbon dioxide, hydrogen sulfide, nitrogen and total dissolved mass; also use of isotopes of strontium, carbon, hydrogen, helium, oxygen.
3) Effects of clathrates on flow.
4) Overall geological framework which should include a model, the sediment types and structural types present.

5) DPG membership should include panel interest (S. Dreiss, J. Boulegue, M. Goldhaber); others who could be included are Kvenvolden and Voss for unbiased perspectives.

N. Christie-Blick of SGPP reported on the Sea Level WG. In summary:
A SLWG will be created following the release of a sea level workshop report. This WG should have in its objectives:

a. Timing of sea level change.
b. Amplitudes of sea level change.
c. Effects of sea level change.
d. Why sea level change occurs.

The group would draw the research to focus on the Neogene/late Paleogene; Oligocene/Miocene; and Cretaceous sea level changes. The WG should devise the strategies for the research-seismic; use of passive margins; siliclastic sediments; atolls and guyots; indirect measurements including oxygen isotope record. Is the JOIDES Resolution the best way to do these studies?
WG also needs to consider sites which are influenced by strategies and should have geographic breadth. It should also have a membership which includes SGPP and OHP panel representatives (i. e. SGPP persons could include N. Christie-Blick, R. Flood, D. Stow, M. Itc. J. McKenzie). Other members of the WG should include an objectives person, a strategies person, a technology person and someone connected with IGBP/Global Change.

T. Pettigrew of ODP/TAMU reported on technology issues. The description of the Vibra-Percussive Corer which was distributed previously contains the following highlights:
1) Rubber sleeve use was a possibility, but the prospects for use by ODP are slim; in the petroleum industry these are seen to be quite difficult to get recovery, and the best prospect seems to be the vibracorer with the added double hammer. Other modifications including out-of-round barrels and oscillation are being attempted but could create disturbances. Some panel members felt that undisturbed fabric was as important as getting the core. Both the out-of-round and oscillation could drastically affect the fabric.
2) An element is in production, and will likely be finished in February, 1990; it will undergo sea trials about May of 1990.

The second day of the meeting was called to order at 10:30 AM, January 15, 1990, following approximately two hours of small-group-work on the SGPP white paper. The present white paper contains a preface and highlights which replaced the original introduction. The chapter on the sediment fluxes and depositional architecture have been modified to have similar format to other sections. A section on budgets and mass balance has been added with modifications being done on the paleocean chemistry section. Sea level change and fluid circulation in the lithosphere are essentially unchanged.

After a brief discussion and introduction by E. Suess, the meeting got underway. Moberly commented that approaches to "hostile" environment drilling may face budgetary constraints and could restrict solving problems associated with drilling those environments. Suess furthered the discussion by stating that all would benefit from having those objectives solved, not only SGPP requests. Already there are sites which have been assigned which will utilize the coarse sediment technology. SGPP urges the development of this technology. There exist environments other than sands which will require the development of the technology for the recovery of coarse-grained sediments. A formal document on this is forthcoming.

Special Reports (continued)

John Parkes, microbiologist from the Scottish Marine Biological Association, reported on work associated with ODP drilling during which he was able to accomplish microbiological measurements at depth. Bacteria are ubiquitous; there are lots of questions on biogeochemistry which can be asked to address investigations of marine environments.

His work utilized a suite of techniques (direct counts, activity with radiotracers, DNA stains, sulfate and nitrate reduction). Such techniques had been used on Leg 112, Site 681. Changes in populations of bacteria are usually observed in the upper 10 m or so of sediment; this maximum depth has been disputed. It appears that bioavailability of organic matter is the key. In the Japan Sea, Leg 128, the initial work of Leg 112 was repeated, and it was observed that low but repeatable rates existed below 10 m. There is a need to look at more environments and to examine and grow organisms at in situ pressures and temperature. There is lots of promise for new perspectives but at present, no radiotracer studies can be done on board the JOIDES Resolution.

There followed a general discussion of the idea of doing tracer work -both radioactive and stable isotope- on the JOIDES Resolution as well as concerns about shipboard contamination. An operation SWAB could be a way of keeping contamination minimized. Radiotracers can be tested for quite easily in a matter of days but it is unclear how one can get at the stable isotope contamination problem? Working near land bases and on an associated ship may be the best solution. In the UNOLS fleet, some vessels are "clean", and hence tracer work can be done.

Tom Pettigrew of ODP/TAMU presented information on the pressurized core barrel (PCB) and its deployment. Priorities for its use are the recovery of fluid and gas samples for work up to 400 °C and the possible collection of a gas hydrate. At present any method of extraction of a core will greatly disturb the fabric of the sample. There is a need to have this instrument ready soon, so that the highest priority should be to collect gases, possibly without transfers. Considerable enthusiasm was expressed over the prospect of doing radiotracer experiments in conjunction with the pressurized core barrel; the microbiologists need to come forward with their requirements as well as physical properties people.

ACTION: A document which details the concerns on artifacts, and a wish list for the PCB is in draft form now by SGPP.

ACTION: A document on radioisotope use should be prepared- the users should be questioned about alternative uses on the JOIDES Resolution. Radioactive and stable isotope tracers are useful to ODP work; avoiding contamination should be the major concern for SMP; SGPP will flag future proposals requesting such uses.

Proposal review and ranking

There were 50 proposals which needed to be discussed and which included 2 new ones (hand-carried by Ralph Moberly), 12 which were received between the Kiel meeting of last September and the Santa Cruz meeting, 6 proposals were holdover because they only received preliminary discussion at the Kiel meeting, and 30 proposals from the first and second SGPP meeting. Also discussed were even older proposals which were part of the SOHP-package were submitted prior to the existence of SGPP. Several of these were of high panel interest. A ranking requested by PCOM would be used toward the next 4 years of drilling and could be updated as new proposals came in and others were modified. Included in the ranking are the Cascadia I, EPR, SRC II and the Chile Triple Junction proposals.

Proposal 352: Drilling into Layer 3 of EP crust. Presented by J. Boulegue. The number of sites chosen and depth of penetration environed are reasonable. Mostly a LITP proposal; metamorphic geochemistry is of interest to SGPP if the nature of gases and extent of alteration were included; A focus on this topic could be brought to the proposal and would improved it. Ranking 2A.

Proposal 353: Antarctic Peninsula Pacific Margin. N. Christie-Blick presented the details of the proposed drilling of a colliding plate boundary in an attempt to look at both the plate

boundary and at the glacial history of Antarctica. Dating the sediments seems problematic. There are technical problems with the proposal: 70 days on site; could stratigraphic resolution be improved over that of the present oxygen isotope data which exists? The time of collision was a time of major sea level vise. Proposal somewhat parallels the one on the Chile Triple Junction. Is there value in separation of the ice sheet information for timing? OHP should look at this. Perhaps 351, Bransfield Strait, could be merged with this one for a better perspective. Ranking 2A.

Proposal 354: Late Cenozoic History of Angola/Namibia. J. Mienert presented the details of this proposal which involves study of the mechanism of climate change. The relationship to upwelling is also brought into the research. The proposed work would yield information on the history of upwelling of Angola, and on sea level changes. There are 4 transacts with a total of 15 drill holes in Neogene sediments. No detailed seismic exists as yet. There is an indication of slumping in some areas. It is not clear how the land-to-sea sections are tied in or how sea level changes are to be reconstructed. Definitely with SGPP interest, but needs statement on sea level, fluid circulation and organic diagenesis. Is the targeted age (max. 4 million years) appropriate? Could be a prime example of a one glaciated pole. Good biomarkers are present, on a passive margin, with global significance. Metals could be mentioned; clathrates could exist. Needs broader interest and time frame. We encourage proponents to get good seismic. Rank 2A-3.

Proposal 355/A: Formation of a gas hydrate. M. Goldhaber presented the details of this proposal. Most (75%) of the focus is on the formation of a gas hydrate. The area of study is near Leg 112 on the Peru margin. New seismic exists which is reprocessed. The strategy is to drill to the basement and do a detailed physical and chemical properties study of the properties of a hydrate. Proposal also contains a paleoceanographic component: landward migration of the upwelling signal in Lima Basin; this is of interest to OHP. Ranking 4.

Proposal 272/E/revision 2: Neogene upwelling and the history of the California Current. S. A. Macko presented details of this proposal. The proposal is to look at 8 sites from near the EPR, near the area drilled during DSDP legs 18 and 63. SGPP interest is in evolution of climate, stratification of water masses, sedimentology and causes of anoxia but overall it falls mostly into OHP mandate. OHP had queries on the geochemistry objectives; none are proposed. The proposal needs some preliminary model to be tested. In view of newly proposed sites, what is the status of the seismic? Ranking 2A.

Proposal 356/A: Denmark Straits. J. McKenzie discussed the details of this proposal. The proponents want to drill 9 holes to obtain high quality data for paleoclimate research. No cores from previous drilling are available because of poor recovery. The Global Circulation Maps being developed by the proponents need more data. An understanding of climatic effects on circulation would result. Where sites are located is not detailed on maps. A bit immature and somehow cumbersome to follow what exactly proponents wish to accomplish by drilling. Ranking 1, (not within mandate).

Proposal 357: Axial and off-axial drilling on the EPR. J. Boulegue presented the details of the proposal to drill 9 Holes. There is good information on the drill sites and general location; extensive surveys exist of the hydrothermal vents. The temperature range encountered is 15°C to 330 °C. What are the relationships between vent temperature and temperature of alteration? It is a well-studied area for biological input. It attempts to identify a well-developed seismic reflector, and the role of a seamount in the area. Related to proposals 321 and 325. Ranking 4.

Proposal 317 addendum: Northern Cascadia margin (Vancouver). M. Goldhaber presented the addendum. Previously fluid flow, geochemistry, sedimentology were not developed enough,

and this addendum builds up on those deficiencies the use of clathrates as an indicator for flow is nicely developed. Ranking 4.

Proposal 286/E: Drilling layer 2/3 transition at Hole 504B. P. Froelich presented this new information. Problems are anticipated with the hole restart (engineering problems). SGPP would like to see a temperature log of the well and acquisition of water samples from the hole. THIS HOLE WILL BE DONE; no ranking needed.

Proposal 221/E: Eastern Equatorial Pacific Neogene. J. McKenzie presented new information on this proposal. The sites have been selected. The fluid movement in the upper crust could be addressed and detailed by pore water chemistry. THIS SITE IS IN THE PROGRAM; no ranking needed.

Proposal 358: Formation of Volcanic Rifted Passive Continental Margin. Ranking 1; not in SGPP interest.

Proposal 360/D: Metallogenesis at Valu Fa Ridge. M. Goldhaber presented the details of this proposal. In terms of ore deposits it present a very interesting idea. Study of massive sulfides forming in a back-arc basin at 2 sites (40°C and 340°C) is proposed. Problems may be the high temperature and low pH (2). Leg 135 will be in the area, but this proposal was rejected by the WG on Lau. It could not fit in or replace sites, although it seems to be an important location. Ranking 4.

Proposal 329/A: Cretaceous paleocommunication between North and South Atlantic. S. A. Macko presented the details of the proposal. The principal aims are to explore the way in which the Atlantic Ocean evolved by clarifying geochemical, sedimentological, stratigraphic and tectonics arising from the invitation of the ocean. Recoveries at one of the locations had been poor previously (8%). Is this within the primary goals of SGPP? Proponents should communicate with the 313 group. Whereas we would encourage the proponents, the proposal appears more within the OHP mandate with some input by SGPP. Ranking 2A.

Proposal 326/A: Cooling of Northern Hemisphere. M. Ito presented the details of the proposal. It is similar to 356/A, the development of paleoclimate with formation of a gateway. Six sites are proposed for the Fram Strait. The development seems to fall within the OHP mandate. Target areas for ice margin processes evident. Why were the sites chosen? Could be combined with 320. Together these proposals would make a stronger package, including porewater geochemistry-sedimentary geochemistry. Ranking 2.

Proposal 329: History of the Benguela Current. J. McKenzie presented the summary of this proposal which would look at regional paleoclimatology, reorientation of the Benguela Current and sea level change. It would distinguish terrestrial input and compare it to the marine component. The proposal is not fully developed, but the area is very interesting owing to the high productivity. Why do the proponents want to drill back to the Cretaceous? Seismic profiles are not shown. Massive sediment slides may exist. Should consider combination with 354/A. Immature proposal; Ranking 2A.

Proposal 347: South equatorial Atlantic. J. McKenzie presented a synopsis of this proposal to study deep bottom water circulation. Not in SGPP, more OHP; Ranking 1.

Proposal 349/A: Drilling into a clastic apron Gran Canaria. J. Boulegue presented information about this proposal. It is a study on chemical evolution during volcanic and orogenic activity. It is of interest to SGPP from the aspects of mass balance (volume of clastics) and the rate of erosion of volcanic islands. It also is interesting for studies of chemical fluxes, and hence within the SGPP mandate; SGPP-related aspects appear relatively immature. It has been mapped geologically. Ranking 3.

Proposal 350: Plio-Pleistocene sedimentation and plate deformation, Gorda Deformation Zone, N. California. M. Goldhaber presented information on the 4 sites proposed to be drilled. The magnetics are being deformed by the movement of the Gorda Plate; these deformations will be studied. Also incorporated into the research are studies on the origin of the California Current and of the Cascadia fan turbidite layers. The relationships to glacial maxima will be sought. The main focus seems to be tectonic and OHP objectives. The sedimentological objectives place this proposal in the SGPP interest area. Ranking 2A.

THERE ALSO EXIST MANY OTHER PROPOSALS FROM THE SOHP ERA WHICH ARE MAINLY ATLANTIC LEFT-OVERS WHICH HAVE NOT BEEN SEEN BY SGPP. It would be of use to know more about these.

The third day of the meeting was called to order at 8:30 AM, January 16, 1990, to finish discussion of proposals and to rank them for PCOM along the lines of SGPP interest.

Prior to review, a discussion of older SOHP-era proposals was attempted based on the notes of former SOHP panel members. These include proposals 221/E, 142, 195, 271/E, 199, 259/E, 257, 275, 202, 203, 260, 182, 222, 253,284, 224, and 250. Some of these proposals have been combined, others have become portions of the ODP program and others have been modified and resubmitted.

Proposal 322/A: Florida Escarpment. This proposal was re-considered by the panel following a lengthy rebuttal of the proponents concerning questions raised during an earlier SGPP review. J. Boulegue gave a summary of the first version of this proposal for determining extent of seepage off the Florida Escarpment. The panel felt their concerns were not dispelled by this letter; i. e. the proponents should still look into existing oil company data from the area. E. Suess to draft a letter with help from J. Boulegue. Still ranked 3.

Proposal 362/E (Old 318): Chile Triple Junction: Two legs are planned for drilling. This is an active ridge system which is being subducted. The work will yield much new information on pre-, and post-collision zones. The proposal has been expanded considerably to include greater detail on fluid flow; it remains uncertain if the fluid flow is active but is very likely, all potential holes do not address fluid flow interests of SGPP. The potential for using mantle volatiles to trace fluid flow is exciting. Ranking 4.

Proposal 361: Drilling of active hydrothermal system, TAG area. E. Suess gave a summary of this proposal to look at a slowly spreading environment in an unsedimented deep site at high temperature (greater than 350 °C). The site is mature enough to look at mineral relationships. The strategy is to work two locations, a shallow and a deep one. It uses hydrothermal system to explain diagenesis. Needs detailed surface morphology, heat flow and seismic reflection. [*Mail review received from H. Elderfield supports this ranking; TAG is an excellent drilling target and SGPP should offer strong support]*
Ranking 4.

Grouping of drilling proposals by SGPP themes prior to ranking

Sea Level

Rank 4:	203/E, 335/E, 337/D, 348/A
Rank 3:	338/D, 345/A

Fluids & gases

Rank 4:	233/E rev., 284/E, 290/E, 314/D, 342/A, 355/A, 361/A, 237/E-317/E add., 362/E rev.-318/E rev.
Rank 3:	351/C

Rank 2a: 350/E, 352/E
Not yet ranked: 330/A, 332/A

Metallogenesis & hydrothermalism
Rank 4: 321/E, 325/E, 357/E rev., 360/D
Rank 3: 275/E rev.
Not yet ranked: 252/E

Sediments & Mass Balances
Rank 4: 348/A, 59/A rev.
Rank 3: 327/A, 341/A, 349/A
Rank 2a: 320/A, 323/A, 326/A, 328/A, 329/A rev., 336/A, 353/C rev.
Not yet ranked: Bering Sea, 250/E, 340/B

Paleoceano-chemistry & paleoceanography
Rank 2a: 271/E rev. 2, 339/A, 354/A

The proposals were initially grouped into the above thematic categories and ranked within those or eliminated from further discussion because of lower SGPP priority. (i.e. 1 not in SGPP mandate; 2 of marginal interest to SGPP). This procedure left 14 proposals, including several groups of proposals on the same topic. These were ranked by selection and comparison between the top proposal in each category while maintaining the priority within the category:

1) Cascadia; 233/E rev., 237/E, 317/E add
2) Chile Triple Junction; 362/E, 318/E rev.
3) Atolls and Guyots; 203/E, 335/E
4) Sedimented Ridge Crests-II; 284/E, 290/E
5) New Jersey Margin; 348/A
6) Peru Gas Hydrates; 355/A
7) East Pacific Rise bare rock; 321/E, 357/E rev.
8) Gulf of California; 275/E rev.
9) New Zealand Margin; 337/D
10) Barbados Ridge; 342/A
11) TAG area; 361/A
12) Northern Juan de Fuca; 325/E
13) Nankai II; 314/D
14) Valu Fa; 360/D

Others which are not presently included in the ranking because of deficiencies, but very likely to be ranked high include: 330, 332, 250, 340, 252 and Bering Sea.

Rationale for final ranking

1) Cascadia: These proposals give an opportunity to look at a geological framework of fluid flow and model it with regard to sediment and structure type. Both proposals have appealing aspects by contrasting different styles of dewatering of an accretionary prism. The Oregon margin represents specific tectonic elements with different but apparently well-defined flow regimes whereas the Vancouver margin has a relatively simple tectonic setting and hence a broad flow regime. Overall the Oregon proposal seems to address better fluid objectives whereas the Vancouver proposal contains better structural aspects. SGPP's interest lies with the fluid objectives.

2) Chile Triple Junction: The SGPP supports the proposal for drilling the Chile convergent margin because it offers the potential to study a unique hydrothermal environment where the active ridge system is being subducted beneath an overriding continental plate. Of primary interest to SGPP is the study of fluid processes at the rift-contact zone, where the fluids emanating from the hot subducting ridge crest are introduced into the fore-arc sediments. The injected fluids could contain mantle derived volatiles which would mix with continentally derived pore fluids. Using the helium tracers should allow for the quantitative modeling of flow rates, directions and pathways of the fluids within the accretionary prism. The study of fluid circulation processes is a high priority theme for SGPP.

3) Atolls and Guyots: These proposals, considered as a project together, were ranked highest by SGPP under its theme of sea-level change. They are mature proposals which will likely place constraints on the timing of sea-level change for an area of the North Atlantic region which dominates the existing seismic stratigraphic record, and for the mid-Cretaceous to the early Cenozoic. This record will be of importance in the evaluation of sea-level change in a largely non-glacial interval. The proposals also contain several other major objectives including the causes and timing of Cretaceous carbonate platform drowning.

4) Sedimented ridge crests-II: The first leg of the SRC will provide the basis for understanding the hydrology of Middle Valley and of the associated metallogenesis. This second leg is will-justified by deepening of the hole in the basement in view of reaching the high temperature reaction zone and investigating different stages of sulfide formation in the Escanaba Trough.

5) New Jersey margin: This proposal was ranked highest of the proposals aimed at the late Paleogene to Neogene sea-level record, an interval likely to be strongly subdivided by glaciation. Drilling will be conducted on a passive margin that is already well-known geologically and clearly appropriate for sea-level studies. Additional high-resolution seismic data will be collected during 1990.

6) Peru gas hydrates: This will be an opportunity to do a detailed study of how gas hydrates form, what controls their fine-scale distribution and their physical properties. Particularly attractive to SGPP is the combination of geophysical and geochemical objectives among them to test the use of acoustic properties from seismic data to quantify the distribution of gas hydrate and free gas, the precision of heat flow derived from the depth of the BSR, the effect of hydrate on thermal conductivity, and estimate the impedance of flow caused by plugging through hydrate.

7) East Pacific Rise: The two possible targets (12°50'N and 9°40'N EPR) provide a geological setting favorable for tectonic, hydrologic, geochemical purposes related to fluid circulation and water-rock interaction in bare-rock settings. This program must be considered as the compulsory scientific complement the SRC I and II.

8) Gulf of California: SGPP was impressed by opportunities to study hydrothermal alteration/metallogenesis in an organic rich sediment pile. We were also favorably impressed by the broad context of the study: i. e. the usefulness of comparison between Guymas Basin studies and onshore processes in the Salton Sea geothermal system/ ore genesis in Baja California/ comparisons with accreted terrains formed in similar settings.

9) New Zealand margin: This proposal aimed at sea-level changes in the Paleocene and Neogene will take a sequence stratigraphic approach in an area that is far from the passive margins that dominate the existing stratigraphic record.

10) Barbados accretion: This leg is envisioned as an ideal location for a field laboratory to study tectonics and fluid flow in accretionary prisms over large scales and long terms. Barbados has the advantage over other settings because there is a large existing database and well-developed theoretical hypotheses to be tested. This is a good site for drilling because drilling through under thrust sediments is feasible.

11) TAG area: This proposal will look at a slow spreading environment, which is at fairly high temperatures. It will enable modeling of mineral reactions from an active hydrothermal system.

12) Northern Juan de Fuca: This site is in the geographic area of the SRC program and hence complements some of the high-temperature objectives. It can provide an alternate bare rock site although the proposal at this time has some deficiencies.

13) Nankai-II: This proposed leg is to investigate a coarse-grained end-member accretionary prism. It will provide an excellent opportunity for comparison with a fine-grained prism such as Barbados. This second leg will provide an opportunity to return to the same area as the upcoming Nankai leg to measure additional physical properties and conduct long-term experiments.

14) Valu Fa: This leg is viewed as important to the SGPP theme of metallogenesis in alkaic (back arc) settings.

Other Business

There is a need to think about and respond to an IHP request for what will go into the ODP database (E. Suess to conduct mail survey).

We are missing proposals for three suggested sites that look important: The Gulf of California, the Navy Fan and the Barbados proposal properly assembled. E. Suess to obtain and distribute copies.

Membership: Two US participants are rotating off P. Froelich (after November meeting 1990) and M. Goldhaber (after spring meeting, 1991). Possible replacements were discussed at this meeting for appointment by PCOM. E. Suess to forward a list to PCOM for their April meeting, based on mail-survey of SGPP members.

Next meeting to be held in Paris on the 2nd and 3rd of November, 1990 with Jacques Boulegue as host.

We are grateful to S. Dreiss for organization of this meeting and especially for arranging the lunches; we also thank UC Santa Cruz for use of the campus facilities.

Submitted
Stephen A. Macko
SGPP secretary
Erwin Suess
SGPP chairman

Appendix
SGPP minutes
Santa Cruz 14-16 January 1990

JUSTIFICATION OF SGPP 1991 DRILLING PRIORITIES

At it's July 1989 meeting held at Lamont-Doherty Geological Observatory, the SGPP voted on the programs from which PCOM will formulate the 1991 drilling schedule. This voting resulted in the following ranking:

1) Sedimented Ridge Crests
2) Cascadia Accretionary Prism
3) East Pacific Rise Bare Rock Drilling
4) Eastern Equatorial Pacific Neogene Transect
5) Chile Triple Junction

The SGPP panel wishes to emphasize that the two top rated programs were far ahead of the remaining four. All first and second place votes were cast for the two top rated programs and the numerical difference between these two was small. In a general sense, our top-ranked choices reflect a significant SGPP thematic emphasis on quantifying fluid circulation and rock-water interactions in settings with substantial involvement of the sedimentary section. Specific observations on the two top rated programs follow.

SEDIMENTED RIDGE CRESTS

Metallogenesis and fluid circulation are two major elements in SGPP's forthcoming white paper summarizing the panel's thematic goals and objectives. Although metal accumulation arises in a spectrum of marine environments, particular interest focuses on the so-called volcanic massive sulfide deposits. These are now recognized to have formed as a result of oceanic-based tectonism and comprise over a thousand known deposits including some of the world's major suppliers of Cu, Pb, Zn, Ag and Au. Studies on ancient deposits support the conclusion that economic mineralization in many major districts occurred in the subsurface under sedimentary cover. Special opportunities in studying these ore forming processes through ocean drilling arise from the ability to examine in three dimensions the active phase of fluid/mass transport and rock-water interactions in a modern system. These same processes of hydrothermal circulation contribute significantly to crustal alteration and control of ocean chemistry, both high priority SGPP themes.

Our panel's discussions on these topics have consistently revolved around the importance of addressing the hydrothermal flow regime in three dimensions and on identifying the specific rock-water interactions associated with these flow paths. The report of the Sedimented Ridge DPG addresses these issues with what we feel is an extremely well-conceived study. The proposed two-leg drilling program provides exceptional balance among detailed study of hydrology, crustal interaction with fluids, and fundamental metallogenic issues. The emphasis on quantifying the flow system in Middle Valley addresses a major thematic objective of the SGPP. Likewise, the comparison between Middle Valley which is at a relatively immature stage of hydrothermal evolution, with the Escanaba sites which are at a more mature stage will allow perspectives on massive sulfide formation available in no other way. Finally, we believe that the dramatic contrast implied by isotopic and elemental abundance data in sources of ore and accessory elements between Middle Valley (basalt dominated) and Escanaba (sediment dominated) requires drilling in both areas to understand the origin of these crucial differences.

CASCADIA ACCRETIONARY PRISM

The SGPP white paper identifies the large-scale circulation of fluids within the oceanic lithosphere as a high priority theme. Of the hydrodynamic zones in which this circulation occurs, the SGPP believes that active margins are of highest priority for drilling over the next several years. This view arises from our perception that fluids moving through and flowing out of accretionary wedges are important for understanding geochemical fluxes in the lithosphere and hydrosphere.

The SGPP has discussed the relative merits of two Cascadia drilling proposals, 317/E (Vancouver Margin) and 233/E rev (Oregon Margin). We see advantages in each setting. The Vancouver study area has excellent heat flow coverage and evidence for thermal patterns influenced by fluid circulation. It represents apparently simple large-scale accretion tectonics. The Oregon setting is characterized by abundant active venting; distribution of vent sites according to specific tectonic settings; excellent imaging of surface vent sites and subsurface structure for choosing drill sites that promise to intersect and sample diverse elements of the plumbing system.

Despite the merits and advantages of each area, the SGPP feels strongly that at present, the Oregon proposal more clearly addresses our thematic objectives. It is completely focused on our priority themes of understanding fluid flow processes and geochemical evolution of the prism. Geochemical, sedimentological and hydrologic studies of the surface and shallow sub-surface of the Oregon area have been ongoing for several years and are at an advanced stage. In contrast, comparable work in on the Vancouver site has not progressed to the same extent. The Vancouver proposal as initially received and discussed by the panel is focused more heavily on accretion-tectonics topics and incorporated little fluid chemistry. Nor did it adequately address sedimentological issues such as the deformational fabric of the wedge sediments. For these reasons, our high ranking of the Cascadia program specifically reflects our thematic objectives as embodied in the Oregon margin study.

We recognize, however, that new information has been and will be forthcoming in the near future. Such information would probably add much to sharpen the fluid circulation-geochemistry objectives of the Vancouver margin proposal, and the tectonic objectives of the Oregon margin one. In this situation a DPG would be needed to sort out the additional information and such a DPG would be a productive undertaking to plan two legs.

EAST PACIFIC RISE BARE ROCK DRILLING

Although much lower ranked as a SGPP priority than the two programs above, the East Pacific bare rock drilling also has considerable thematic importance for our panel because of the implications for crustal alteration and sea water exchange. Although we have not as yet held comprehensive discussions of all proposals, our feeling is that the final program must occur at a site with high temperature hydrothermal flow to allow evaluation of the dynamics of an active hydrologic regime. Sites with low temperature venting would be of less interest.

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

Texas A & M University
College Station

23-24 January 1990

EXECUTIVE SUMMARY

1. Panel is restating the following key recommendations from its previous meeting: these were reportedly not discussed by PCOM at the November 1989 PCOM meeting.

   (i) High temperature logging remains the biggest challenge facing the Panel.

   "A high-temperature logging tool combination rated to at least 350°C be developed by the logging contractor to address as many as possible of the following scientific needs identified by LITHP and listed below in decreasing order of priority.

   1. Temperature
   2. Borehole Fluid Resistivity
   3. Formation Resistivity
   4. Natural Gamma
   5. Sonic
   6. Caliper
   7. Flowmeter
   8. Borehole Fluid Pressure

   The objectives are to be achieved by repackaging existing tools, not by the development of new tools."

   [DMP Recommendation 89/17]

   (ii) "Funds for the development of the high-temperature tool combination, currently allocated as $300,000 for tool hire during FY91 and FY92, should be made available as soon as possible to allow the redirected initiative to be brought to fruition before the estimated tool deployment date of mid-1991."

   [DMP Recommendation 89/18]

   (iii) "A JOI-supported inter-programme workshop on high-temperature logging should be planned, and scheduled to take place before mid-1990, in order to develop the necessary engineering science for the longer term."

   [DMP Recommendation 89/19]

2. Panel is concerned that the downhole-measurement and lithosphere-basement objectives at site 801 have been compromised by the decision of the Co-chief scientists not to carry out downhole measurements in basement at this site. Panel asks PCOM to provide an explanation of why the scheduled downhole measurements were not made. Panel notes that had PCOM policy on downhole measurements been followed, the scientific objectives of Leg 129 could and should have been realised. Chairman is asked to raise these key questions with the PCOM Chairman as soon as possible.

3. "Since re-entry hole 801C is located just three days out of Guam, this hole should be re-entered and the aborted programme of downhole measurements carried out before the JOIDES Resolution leaves the Western Pacific. This is an important issue because hole 801C penetrates very old crust and there is no provision for ODP to drill crust of similar age in the future."

[DMP Recommendation 90/1]

4. Panel re-affirms its earlier recommendation re VSP deployment as it also did on a previous occasion (DMP Minutes, 6-7 October 1988). In view of the time required to set up and run vertical seismic profiling, zero-offset VSP does not give sufficiently greater information, relative to the sonic log, to justify VSP as a matter of routine. If there is a seismic interest in an area, VSP would be supported by DMP. If VSP is run, deployment is the responsibility of the logging contractor. Panel supports the SMP proposal that VSP data storage and processing become the responsibility of the underway geophysics function.

5. Panel reiterates its support for the concept of sealing instrumented re-entry holes as originally conveyed through DMP Recommendation 89/14.

6. In reiterating its earlier recommendations on high-temperature logging (89/17 - 89/19), Panel noted that the target for the short-term development of high-temperature logging technology was now February 1991. Within this shorter time frame the high-temperature slimhole logging needs of the JOIDES Lithosphere Panel in connection with EPR objectives cannot be fully met. The situation might be eased if reaming were a proven option under EPR conditions. In the current absence of this option, there is a need to draw up a schedule of realistic developments for different diametral constraints. This task is charged to a subgroup to meet after this DMP meeting. The minimum target should be those LITHP objectives which are the most readily achievable : temperature, formation resistivity and borehole fluid pressure. In addition, borehole fluid resistivity measurements should be investigated.

7. "Facilities be created allow the development before February 1991 of a slimhole high-temperature downhole-measurement capability at least for temperature, formation resistivity and borehole fluid pressure, together with borehole fluid resistivity if technically feasible. The development is to be based on adapting existing tools."

[DMP Recommendation 90/2]

8. "The reaming option for hole enlargement from four to six inches in diameter under EPR conditions should be fully tested."

[DMP Recommendation 90/3]

9. There is a need for a long-range development plan for high-temperature technology. This should be based upon the ODP long range plan. The latter should be scrutinized and logging needs extracted. This information should be incorporated with pertinent messages from the JOIDES thematic white papers. Cost estimates should be produced and priorities listed. The task of developing a long range plan for high-temperature logging was assigned to a working group comprising Anderson, Worthington, Lysne and Sondergeld. The group may need to meet once in April in order to agree and finalize its submission.

10. Three courses of action have been agreed for improving the shipboard computer situation as it pertains to downhole measurements.

    (i) The FMS-dedicated microvax and other downhole-measurement computers be incorporated into the shipboard VAX network (in view of the stated intention that FMS data would not be transmitted through ETHERNET).

    (ii) LDGO joins with TAMU in the maritime maintenance agreement with DEC. (This currently costs around $18-22,000 in total and is unlikely to cost LDGO incrementally more than $5-6,000.)

    (iii) The FMS-dedicated microvax be located in the machine room where the TAMU system managers will provide back up. (However, the system managers are not conversant with Schlumberger software.)

11. "TAMU and LDGO should work towards an integrated shipboard computer system which accommodates all log and core needs. An immediately identifiable goal is that log and core data be easily and simultaneously accessed, displayed and interrogated through one database management system."

[DMP Recommendation 90/4]

12. "Representatives of DMP, IHP and SMP should meet in a workshop session to identify user needs and develop data presentation styles for integrated log and core data. This workshop should take place before the proposed DMP/SMP joint meeting in October 1990."

[DMP Recommendation 90/5]

13. The Wireline Packer has been delivered to LDGO. The LAST tool is ready for deployment on Leg 131. The Geoprops Probe is unlikely to be ready for Leg 131 : however, the tool has been manufactured and there is a possibility that it can be assembled and tested in time.

14. "The BGR of FRG high-resolution borehole magnetometer should be scheduled for deployment in Hole 504B after deepening."

[DMP Recommendation 90/6]

15. In accordance with its adopted thematic thrusts, Panel reiterates its commitment to the creation of a database of global stresses. Panel regards the removal of basement objectives from Leg 138 as a potential loss of opportunity.

16. "Downhole temperature measurements, fluid sampling and drillstring packer experiments be carried out in Hole 504B during the third engineering leg (136) and before any engineering work is undertaken."

[DMP Recommendation 90/7]

17. "The following programme of downhole measurements, which complement existing data, should be carried out at Site 504B before recasing:

Formation Microscanner
Wireline Packer
Flowmeter Packer
Enhanced Resolution Tool
Sidewall Coring (possibly through wireline re-entry)

Options are to undertake this work during the third engineering leg (136), during a subsequent leg (139) dedicated to 504B, or during a subsequent minileg or segment of an EPR leg."

[DMP Recommendation 90/8]

18. Measurement-while-Drilling (MWD) technology should be very closely monitored as a basis for evaluating its possible deployment in ODP phase 2.

19. "The logging contractor through LDGO and on behalf of ODP should become a corporate member of the Conoco-led industry consortium for the testing of MWD and other downhole-measurement tools. This will require that $30,000 be budgeted for FY91."

[DMP Recommendation 90/9]

20. The next DMP meeting will take place on 28-29 June 1990 in Seattle, Washington. D Cowan to host.

The subsequent DMP meeting is tentatively scheduled for 9-12 October 1990 in Brisbane, Australia. This four-day meeting would encompass a visit to the JOIDES Resolution and a one-day joint meeting with SMP. Date adjustments will have to be made if the schedule of the JOIDES Resolution changes.

Paul F Worthington
7 February 1990

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

Texas A & M University
College Station

23-24 January 1990

MINUTES

Present

Chairman:	P F Worthington (UK)
Members:	B Carson (USA)
	J Gieskes (USA)
	M Hutchinson (USA)
	D Karig (USA)
	P Lysne (USA)
	R Morin (USA)
	C Sondergeld (USA)
	H Crocker (Canada/Australia)
	J P Foucher (France)
	H Kinoshita (Japan)
	O Stephansson (ESF)
	H Villinger (FRG)
Liaisons:	R Anderson (LDGO)
	K Becker (LITHP)
	A Fisher (TAMU)
	X Golovchenko (LDGO)
	M Langseth (PCOM)
	J Mienert (SGPP)
	T Pyle (JOI)
Guests:	W Kessels (KTB)
	*B Harding (TAMU)
	*D Huey (TAMU)
	*T Pettigrew (TAMU)
	*M Storms (TAMU)
	**R Merrill (TAMU)
	**J Foster (TAMU)
	+B Sanford (TAM, Inc)
	+L Sanford (TAM, Inc)
	+T Stancliff (TAM, Inc)
	+C Stokley (TAM, Inc)
Apologies:	R Wilkens (USA)

*Present for agenda items 10-13 only.
**Present for agenda item 13 only.
+Present for agenda item 16 only.

1. Welcome and Introductory Remarks

The meeting was called to order at 8.30 am on Tuesday, 23 January 1990. The Chairman welcomed DMP Members, Liaisons and Guests to the first DMP meeting of the new decade, especially those attending for the first time (Stephansson, Kessels).

Review of Agenda and Revisions

Additional items for inclusion

(i) New Item 5(vi) - Liaison report from JOI, Inc.

[PYLE]

(ii) New Item 27 - Thematic or Synthesis Publications.

[WORTHINGTON]

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

2. Minutes of Previous DMP Meeting, Windischeschenbach, FRG, 11-12 September 1989

The minutes were adopted without modification.

The Chairman signed the master copy for ODP records.

Matters Arising

Item 10 - Software

The Chairman reported that IHP Chairman is content to leave log archiving matters to LDGO.

The survey of options for reading LIS tapes is being pursued but has not yet been brought to fruition. Deferred to next meeting.

[ACTION: ANDERSON, HUTCHINSON]

It was noted that an AAPG format is under review based on the Schlumberger LIS 85. This is being promoted as a potential standard for the oil industry.

3. Chairman's Annual Review

The Chairman provided a review of Panel activities in 1989, as reported at the annual meeting of PCOM and Panel Chairmen held in Woods Hole, Massachusetts on 27-28 November 1989.

DMP operates primarily as a service panel (70%) with some thematic drive (30%). Panel complement is 15, comprising representatives of oil companies (4), JOIDES institutions (2), other universities (4), research laboratories or institutes (4), and consultants (1). One member is retiring at the end of 1989 : a replacement will be nominated shortly.

Three meetings were held during 1989, in Honolulu (16-18 January), La Jolla (23-24 May) and Windischeschenbach, FRG (11-12 September). Three meetings are planned for 1990, in College Station (23-24 January), Seattle (28-29 June) and Brisbane, Australia (9-12 October).

During the period November 1988 - October 1989 a total of 19 DMP Recommendations were transmitted to PCOM. Of these, 10 were accepted, two were not accepted, four drew no comment, and three had become redundant by the time of the PCOM deliberation due to Leg cancellations, etc.

A summary of the 1989 highlights was presented in terms of procedures, tools, profile and planning.

Procedures

A JOI-supported workshop on shipboard logging practices, held in April 1989 and involving previous JOIDES logging scientists, produced 20 recommendations for improvement directed at JOIDES, TAMU and LDGO BRG.

A Job Description has been formulated for the JOIDES Logging Scientist, from the DMP standpoint. This needs to be developed by TAMU for subsequent inclusion in the JOIDES Journal.

Procedures for controlling the development of Third Party Tools have been established and monitors appointed for each of the identified tools.

Tools

The miniaturized Formation Microscanner has been commissioned and deployed successfully.

The status of off-the-shelf technology for high-temperature and slimhole logging has been identified.

Priorities for the development of remedial high-temperature slimhole technology have been identified through inter-panel collaboration.

Profile

Two synthesis publications have been targeted - a multi-authored paper in Basin Research on "Scientific Applications of Downhole Measurements in the Ocean Basins", and a JGR thematic issue on ODP log applications derived from a poster session at the 1988 AGU fall meeting.

A paper on "Scientific Benefits of Downhole Measurements in the Ocean Drilling Program" was presented at an AGU Union Session.

A joint meeting with the German Continental Deep Drilling Project (KTB) in Windischeschenbach, Bavaria, in September 1989 served to increase mutual awareness of the logging activities and capabilities of ODP and KTB.

Planning

CEPAC DPG Chairman attended the May 1989 meeting of DMP at which logging programmes were identified for the major CEPAC themes.

A joint meeting with LITHP in FRG on 11 September 1989 provided for a useful exchange of cultures and resulted in an agreed strategy for the development of new logging technology, especially for high-temperature environments.

DMP has driven towards the development of a high-temperature logging capability, possibly for slimhole deployment : the inter-programme meeting held in College Station on 16 November 1989 constituted an important step in this direction.

1989 has been "data quality year". In addition to the progress made on third party tools, shipboard logging practices and inter-programme exchange, mentioned above, DMP has involved the logging subcontractor, Schlumberger, in one of its meetings in order to clarify maintenance and calibration procedures.

1990 will see a major DMP scientific initiative directed at lithosphere characterization. The aim will be to produce a drilling proposal for a multi-well leg which will involve core analysis for physico-chemical properties, well logging, cross-well electric and acoustic tomography and tracer studies, VSP and long-spaced electric logs, and surface seismic. Important questions to be answered include:

Do log and core data characterize oceanic lithosphere in a locality or are they merely samples of a wide statistical range?

Is lithosphere characterization a function of scale?

Can one reconcile data at different scales in the presence of heterogeneity and anisotropy?

Key issues are to identify technical needs (eg. downhole sources, tomographic software) and resource needs (eg. a second ship, re-entry system). Input will be sought from service panels on feasibility and from thematic panels on target localities and measurements. A draft drilling proposal should be available within 12 months or so.

Two causes for concern were expressed:

(i) The need for a high-temperature (slimhole) logging capability.

In the short term (before mid-1991) we should repackage existing tools to higher temperature ratings, rather than develop new tools for which there are insufficient time and funds. These repackaged tools may not fit down 4-inch holes and, if they do, the narrow annulus might make cooling impossible. Dummy runs should be planned during the second engineering leg. Funds are needed now. In the long term, the most favoured route is through interprogramme collaboration.

(ii) Shipboard availability of Formation Microscanner (FMS) data.

A major drive is to make logs available on board ship at the earliest possible time. FMS images are important for orienting/positioning core as well as filling in the gaps in core recovery. We need to establish the feasibility of FMS image processing on board ship. The goal may be too ambitious because of the complexity of FMS processing.

In summary, 1988 saw the scientific community becoming increasingly aware of the scientific benefits of logging. 1989 focussed on data quality. 1990 will see the continuation of the data quality initiative, the planning of a downhole measurements programme to characterize oceanic lithosphere, progress towards a high temperature (slimhole) technology for meeting thematic needs, and further contributions to the ODP profile.

4. PCOM Report

Langseth stated that he was unable to report since he had not attended any of the three DMP meetings in 1989 and had not been present at the last two PCOM meetings. He was further disadvantaged by the non-appearance of the minutes of the most recent PCOM meeting. It was, however, his impression that none of the key recommendations from the last DMP meeting, i.e. those relating to shipboard computers and high-temperature slimhole tools, had actually been discussed by PCOM. Langseth undertook to write to the PCOM Chairman to ask why there had been no endorsement of these important recommendations.

[ACTION: LANGSETH]

The Chairman expressed his disappointment at Langseth's report. The purpose of DMP recommendations was to solicit endorsement and, where appropriate, action from PCOM. The Chairman would identify the key recommendations from the previous DMP meeting. These would be re-directed to PCOM as part of the Executive Summary of this meeting.

5. Liaison Reports

(i) Lithosphere Panel

Becker reiterated LITHP's need for a high-temperature slimhole logging capability to be developed. In particular, it is essential to have available a high-temperature-rated tool for the downhole measurement of temperature. Without this, EPR objectives will not be achieved.

(ii) Shipboard Measurements Panel

The Chairman reported on the SMP meeting held at the Lamont Doherty Geological Observatory (LDGO) on 2-3 October 1989 (Annexure 1).

Key outcomes were a general acceptance of the common goal of integrating core and log data, support for the concept of a joint SMP/DMP meeting in a ship port of call during 1990, and a desire to incorporate responsibility for the processing of VSP data within the underway geophysics remit (see Item 9).

(iii) Sedimentary and Geochemical Processes Panel

Mienert reported that SGPP has defined five priority themes:

- sediment fluxes and depositional architecture;
- sea level as a record of eustatic change;
- fluid circulation through the sea floor and geochemical balance;
- metallogenesis;
- palaeocean-chemistry as a record of global change.

SGPP has reviewed, grouped and ranked about 54 proposals. The top ten groups are:

1. Cascadia
2. Chile Triple Junction
3. Atolls and Guyots
4. Sedimented Ridge Crests
5. New Jersey Margin
6. Hydrates
7. East Pacific Rise
8. Gulf of California
9. New Zealand
10. Barbados

Important logging targets are:

- High-temperature measurements at mid-ocean ridges
- Accretionary wedges
- Controls on flow, intergranular vs fracture
- Fluid properties, temperature, salinity and pressure, both in the borehole and in pores

- Gas properties; CO_2, H_2S, CH_4
- Physical properties; porosity, permeability, density, and sonic velocity
- Pressure core sampling to calibrate the logs
- Long-term monitoring of borehole temperatures, flow rates and pressures
- Gas hydrates

SGPP has suggested another DPG for the Cascadia accretionary prism.

(iv) CEPDPG

No report - Wilkens at sea.

(v) KTB

Kessels reported that the pilot hole had been completed in April 1989. Current efforts are directed at building up a database of downhole measurements, eg. thermal conductivity, wireline hydrofracturing using a downhole packer.

Fluid conductivity measurements with the AMS tool have suggested inflow in several places. Hydraulic tests have been carried out in the upper part of the borehole. These have indicated an inflow of high-salinity (16000 ppm NaCl equiv.) water to a depth of 3800 m.

The main hole is to be drilled using a new casing concept. The target depth is 10 km. Expected bottom hole temperature is 300°C. The hole must be completed by December 1994. The time allocation for logging is 6.2% of the total.

Further R&D is directed at developing tools which can operate at temperatures above 260°C and at high pressures (25000 psi). No service company offers tools that are designed to operate under these conditions for long periods:

For example, the Schlumberger HEL tools can only operate at 260°C and 25000 psi for periods of 4-5 hours. A questionnaire sent to all known companies has suggested no new opportunities.

A general strategy for developing high-temperature logging tools might be to build very simple analogue versions, ie. with no downhole electronics.

High-temperature/high-pressure tools currently under development for KTB are:

thermal conductivity (Univ. of Berlin)
magnetometer (Univ. of Braunschweig)
susceptibility (Univ. of Munich)

The FMS is too difficult to address. The WBK BHTV does not have a sufficiently high temperature rating.

Maximum permissible tool diameter is 5 inches.

(vi) JOI

Pyle reported that the first official moves to bring the USSR into ODP had started in Washington. JOI has agreed with FRG agencies to fund jointly a second digital BHTV for ODP use. The budget for FY91 is being developed. This is currently $39,600,000 of which $300,000 has been set aside for new technical developments. LDGO and TAMU have been approached to develop proposals for using this fund which is additional to the 4% allocation for special operating expenses. The NSB information briefing in connection with ODP renewal has been rescheduled for 15/16 March 1990. DMP Chairman is one of the invited presenters.

6. National Reports

(i) UK

The Chairman reported that a technical meeting on the BRIDGE initiative had been arranged for 8 February 1990 in London under the auspices of the Society for Underwater Technology. He is scheduled to present an invited paper on "Sensing in Hostile Borehole Environments". Two aspects are highly significant: (1) BRIDGE are anticipating temperatures of 350°C; (2) BRIDGE want to hear about the technology of downhole measurements at these temperatures. It was noted that formal liaison with ODP would be possible if there was the prospect of an inter-ridge organisation.

A second development is the establishment of an International Drilling and Downhole Technology Centre in Aberdeen. The aim is to provide research and development facilities possibly through the coordination of multi-client projects. There is a possibility of a hard-rock tool calibration facility to complement those in the USA.

The Chairman had no further information on the OBCAT programme.

(ii) France

Foucher reported on the new sediment magnetometer, developed by a consortium comprising Total CFP, CEA and Schlumberger, which has two constituent tools. The first measures the modulus of the magnetic field with a precision of 0.1 nT, the other records magnetic susceptibility with a precision of 10^{-6} SI units. The tools are separate, not combined, and have a diameter of 3.75 inches. A sea floor observatory is needed to measure temporal variations in the earth's magnetic field.

Discussions are ongoing with Schlumberger as to whether these tools can be made available to ODP. There is a proposal to deploy them during the upcoming Vanuatu Leg.

A magnetic susceptibility tool for basalts, with a precision of 5 x 10^{-6} SI units, has been deployed earlier in ODP. There is a coordinated programme to develop a three-axis magnetometer for use in the same holes as the susceptibility tool.

NADIA 2 - a new re-entry shuttle is proposed, but still controlled by a manned submersible. The principal transformations, to be completed before the end of 1990, are the inclusion of the main flotation in the frame, the ability to accommodate logging tools up to 4 m long, the introduction of a seven-conductor cable, the replacement of the cable length sensor, and the capability to remain for long periods on the sea floor.

Two field re-entry programmes are planned.

(i) SISMOBS : the aim is to place seismometers in ODP holes (eg. 504A, 320) for 3-4 weeks : date of commencement is October 1990.

(ii) DIANAUT : it is proposed to re-enter oceanic crust of different ages to study hydrogeological processes, and fracturation and its associated magnetic signature.

The re-entry programme is open to any proposals from ODP.

(iii) Japan

Kinoshita described five areas of activity.

(1) Sub-bottom seismic instruments

Deployment in Leg 128 of the Japan Sea. Data have been retrieved successfully. Recovery of the system is to take place this spring.

(2) Downhole Magnetometer

Revival of the tool damaged during Leg 111 with intended application to sediment sections. Aims are related to the dynamics of the earth's core.

(3) Trans Pacific Communication Cable System (TPC 1)

Old telecommunications cable is being replaced. Aim is to re-use this for geosciences when it becomes redundant. Major objective is a RIDGE-related programme in back-arc rifts. It is proposed to monitor long-term well-bore seismicity, tilt, temperature and pressure.

(4) Super-deep drilling

Test drilling to allow a high-temperature programme of downhole measurements directed at hydrothermal objectives, ophiolite (Kuroko belt) studies, and investigations of shallow earthquake foci.

(5) Electrical resistivity experiment on Leg 128

Data acquisition was successful but no further details are available yet.

(iv) Canada/Australia

Crocker reported that he had contacted the New Zealand geothermal programme : they have experience of high-temperature logging (>300°C) which they would be willing to share with ODP.

The Western Australian government has a standing committee to investigate standards for data transfer between oil companies and the government.

A new formation tester, the Modular Repeat Test Tool (MRTT), is due to become available from Schlumberger by April 1990.

Crocker reported that his own formation evaluation tool, which is a wireline formation tester, is being further developed. There is industry interest in slimholing the tool for high-temperature use.

(v) ESF

Stephansson reported that Sweden is active in developing borehole instrumentation for application to radioactive waste disposal. A key objective is to delineate major fracture zones away from a borehole and between boreholes. Major thrusts are cross-hole seismics and seismic tomography, and electromagnetic borehole radar. The radar system has been tested in an old iron-ore mine and has identified major fracture zones 500 m out from the wall. It is less efficient at seeing fractures that are close to the wall. Frequency is within the low MHz range.

Stephansson described his own research interest in stress measurement, in particular the World Stress Map Project and the determination of in situ stresses in Europe.

(vi) FRG

Villinger reported that the report on the ODP/KTB workshop held in Windischeschenbach on 13-14 September 1989 had now been issued.

BGR Hannover are developing a high-temperature (200°C) three-axis magnetometer. Expected completion date is mid-1990.

Arrangements have been completed for the leasing of a WBK digital BHTV to be used by Fuchs (Karlsruhe Univ.) in cooperation with Zoback (Stanford Univ.).

Both projects are looking for interesting Legs/technical targets (see Item 14(v)).

7. Interprogramme Meeting on Slimhole, High-Temperature Borehole Logging

The Chairman reported on the meeting on high-temperature logging held at ODP/TAMU on 16 November 1989 (Annexure 2).

The meeting was attended by representatives of ODP, DOSECC, CSDP, the US DoE Geothermal Program, and NSF. The aim was to identify common goals in the technology of logging small diameter (4-inch) holes in hot (>300°C) environments.

It was agreed that joint action should be initiated. As a first step two actions had been agreed:

- Tom Pyle to approach the Interagency Coordination Group (DoE, USGS, NSF) and the Geothermal Technology Division of DoE.

- Peter Lysne and Paul Worthington to co-author a technical paper for EOS in order to give the initiative appropriate profile.

It was generally considered that once the proposal for collaborative funding had been accepted, a work programme would need to be drawn up by an inter-programme task force.

8. ODP Geochemical Workshop

The Chairman reported on the downhole-measurement aspects of an ODP workshop on progress and opportunities in geochemistry held at the UCLA Conference Center, Lake Arrowhead, California during the period 9-12 January 1990 (Annexure 3).

Several key recommendations were formulated. Among them were:

- develop and implement improved procedures for the effective integration of core and log data, enhanced by a revision of shipboard scientific functions;

- quantify accuracies and precisions of the GLT, and develop/deploy methods for the enhancement of its spatial/spectral resolution;

- include a natural gamma (spectral) facility on board ship;

- investigate the global/regional/local validities of element-to-mineral transforms;

- develop pressure core-sampling techniques;

- deploy packers with fluid samplers, especially for tracer experiments;

- create instrumented boreholes with long-term sensors to measure temperature, flow, fluid conductivity and chemical compositions.

A full workshop report is to be issued in due course.

9. Vertical Seismic Profiling

The Chairman introduced an SMP recommendation that "if VSP becomes a routine part of the program (ie. a zero-offset VSP is run at each site where a sonic log is collected), underway geophysical operations should be integrated with the VSP program".

SMP has asked DMP to reconsider DMP's earlier recommendation that "VSP should not be a routine experiment on the ODP drill ship" (DMP Recommendation 87/2).

DMP Consensus

Panel re-affirms its earlier recommendation re VSP deployment as it also did on a previous occasion (DMP minutes, 6-7 October 1988). In view of the time required to set up and run vertical seismic profiling, zero-offset VSP does not give sufficiently greater information, relative to the sonic log, to justify VSP as a matter of routine. If there is a seismic interest in an area, VSP would be supported by DMP. If VSP is run, deployment is the responsibility of the logging contractor. Panel supports the SMP proposal that VSP data storage and processing become the responsibility of the underway geophysics function.

10. Logging Contractor's Report

Anderson reported on the logging operations during Legs 127 and 128. Although both these legs were in the Japan Sea, very different hole conditions were experienced. Leg 127 provided much trouble with borehole conditions : it was not feasible to use the SES because the drillers were running out of BHAs, and swelling problems had caused the supplies of KCl to become exhausted. In contrast, Leg 128 provided excellent hole conditions. Notwithstanding the bad bridging problems, all holes deeper than 400 m were logged during Legs 127 and 128, with the exception of Hole 795 (Leg 127) which had especially serious bridging.

Fisher, as a member of the shipboard party, reported on Leg 129 during which three sites were drilled (800, 801, 802). The wireline heave compensator did not work at the first site. SEDCO claimed that they were only responsible for the hydraulics and that since this was an electrical fault, it was outside their remit. The problem was finally solved by an ODP technician.

Site 800 produced poor core recovery over large intervals.

Hole 801C, designated a re-entry hole, penetrated virtually unique old Pacific crust, an outcome that had been seen as partly satisfying the objectives of the defunct geochemical reference proposal. At 801C the drilling objectives as per the scientific prospectus were achieved. Unfortunately the Co-chiefs elected to abandon all downhole measurements in the basement in order to obtain 30 m of additional core, the information from which did not materially enhance the drilling objectives. Hole 801C was the only hole programmed for logging within basement. Consequently, the deletion of this programme has meant that the downhole-measurement objectives of Leg 129 were not met. The option to log was available but was not discussed. It is understood that the Co-chief decision was known to the PCOM Chairman who did not enforce compliance with the pre-determined programme.

The Panel generally expressed regret at Fisher's report. Prior to Leg 129, and in response to requests from the community, the Chairman had made representations to the PCOM Chairman alerting him to the possibility of Co-chief-driven departures from the Leg 129 programme. More generally, at this time of renewal negotiations it is imperative that ODP should be seen to be professional on all fronts, including planning. This type of short-fuse decision making, carried out within the parochial context of a single leg rather than the global context of an international scientific programme, is not compatible with strategic planning. It has set back several years the evolution of a coordinated planning culture within ODP.

DMP Consensus

Panel is concerned that the downhole-measurement and lithosphere-basement objectives at site 801 have been compromised by the decision of the Co-chief scientists not to carry out downhole measurements in basement at this site. Panel asks PCOM to provide an explanation of why the scheduled downhole measurements were not made. Panel notes that had PCOM policy on downhole measurements been followed, the scientific objectives of Leg 129 could and should have been realized. Chairman is asked to raise these key questions with the PCOM Chairman as soon as possible.

[ACTION: WORTHINGTON]

In order that this unsatisfactory state of affairs might be redressed, Panel formulated the following recommendation.

DMP Recommendation 90/1

"Since re-entry hole 801C is located just three days out of Guam, this hole should be re-entered and the aborted programme of downhole measurements carried out before the JOIDES Resolution leaves the Western Pacific. This is an important issue because hole 801C penetrates very old crust and there is no provision for ODP to drill crust of similar age in the future."

Anderson reported on tool status. The Formation Microscanner (FMS) has already generated great excitement within scientific parties. It has logged more than 5 km of hole within ten boreholes. Shipboard processing has been stopped by system problems with the operation of the dedicated microvax workstation. The microvax is being recommissioned at LDGO. During Leg 129 temporary use was made of a TAMU user-room microvax.

The ship overhaul in Singapore provided an opportunity for all the logging tools to be checked at a Schlumberger operations base.

Japanese scientists were allowed to cut up the logging cable during Leg 128 in return for a new cable. Unfortunately the Japanese were unable to deliver the new cable in time for Leg 129, due to customs regulations. The new cable is now on board ship but its absence during Leg 129 compromised the logging operations. In retrospect, the decision to allow the cable to be cut was an operational mistake.

The sonic tool (LSS) is still being run uncentralized. The Schlumberger sonic digital tool (SDT), which ODP no longer runs because of poor performance, is being scrapped to be replaced by the dipole array sonic tool which will be especially useful for providing compressional and shear velocities in soft formations. ODP still has only the one-component VSP tool - this is the obsolete Schlumberger WST. Newer VSP tools will not fit through the drill pipe.

A calibration test of the GLT has been completed with high resolution samples from Leg 117. A joint analysis programme with KTB is planned.

During the past year there have been no tool losses in spite of hazardous logging in the Western Pacific where a number of BHAs were lost. This improved performance will result in a reduction in tool insurance premiums.

11. TAMU Briefing

(i) Packers

Pettigrew reported that the TAM straddle packer is now within ODP's domain of responsibility.

The TAM drillstring packer will be used with a new "go-devil" from around April/May 1990. This is designed to open the packer without pulsing the formation and to facilitate the deflating of the packer element.

Questions were raised as to whether the packers should incorporate a fluid-sampling capability and whether borehole fluid samples give good information. There are no TAMU engineering developments in this direction at the present time. However, a sampling go-devil from the OBCAT programme is being proposed for use with the drillstring packer. It seems appropriate to encourage communication between the OBCAT sampling go-devil and ODP sensors.

Pettigrew commented on Morin's proposal to run a downhole flowmeter in conjunction with the TAM drillstring packer in order to produce a "permeability log" of hole 504B (see Item 14, DMP Minutes, September 1989). TAMU engineers are 99 per cent certain that the goals can be achieved. The task will be facilitated by the new go-devil.

(ii) Side-entry Sub (SES)

Huey reported that the new SES, which (unlike its predecessor) does not have load limitations, allows both cable and logging tools to enter the drillpipe through the side entry port. This facility will be a major benefit when the pipe is stuck for it reduces the risk to logging tools. The new SES is characterized by:

- no depth or fatigue limitations;
- designed for faster rigging up and down;
- designed for faster changes of logging tools since tools and sources are located at rig floor level;
- safer for personnel because there is less work over the moon pool;
- greater downhole safety and flexibility for the drillstring since tools can be retrieved when the pipe is stuck, the drillstring can be overpulled, rotated, etc., and, in the worst case, string severing tools can be deployed via the axial throughbore;
- allows more efficient logging operations.

There are risks in SES deployment.

- A bad hole is still a bad hole : bridges place the drillstring at risk. Severing is costly, dangerous and time consuming.

- Logging tools in a tight-bore drill collar can act like a cork in a cork gun (e.g. the Leg 113 incident).

- The Kinley cutter/crimper can only be used if the logging cable is cut at the SES.

- Although improved, some extra rigging time remains with the new SES and this will be complicated by bad weather.

The JOIDES logging scientist should be aware of all these drawbacks.

The new SES will be ready for deployment in mid-1990.

(iii) Sealing of Re-entry Holes

Pettigrew reported on the development of a removable re-entry hole plugging device for projected deployment with instrumented holes in EPR, at sedimented ridge crests, and in Cascadia (overthrust) areas. The seal will be deployed from the ship and will latch into the re-entry cone. The sensor string will be run through the drillstring and latched into the seal. A data logger within the sealing mechanism will allow information to be gathered, perhaps via a submersible.

A project engineer is being designated. TAMU will be responsible for the hardware and seal. Earl Davis (Pacific Geoscience Centre, Canada) will be responsible for the data logger and sea floor interface. Keir Becker (University of Miami) and Bobb Carson (Lehigh University) will be responsible for the downhole sensors. Proposals for the latter two areas are currently in preparation.

DMP Consensus

Panel reiterates its support for the concept of sealing instrumented re-entry holes as originally conveyed through DMP Recommendation 89/14.

(iv) Diamond Coring System (DCS)

Storms reported that the DCS is being assembled at the Kremco facility north of Salt Lake City. The top drive has arrived from Midland, Texas. A new version of the barerock guidebase is under development. DCS hole size is 3.96 inches: core size is 2.2 inches.

The DCS will only be used where conventional drilling systems cannot be deployed. The aim is to introduce the DCS on the EPR during the third engineering leg (136) in February 1991. There has been discussion about some limited deployment during the Lau Basin Leg (135).

At present TAMU are not engaged upon any reaming activity.

12. High-Temperature Technology

The Chairman reviewed the current position. The DCS will probably be used initially on EPR in environments that are very hot (350°C) and pressured. The projected deployment date of February 1991 moves up the schedule for developing some high-temperature logging capability. In this short term there are only two viable options. One is hot slimhole logging through the repackaging/adaptation of existing logging tools. This is in accordance with the PCOM directive that LDGO should not develop new slimhole high-temperature tools for which, in any case, there is inadequate time and money. The other possible approach is that of hot non-slimhole logging, perhaps in DCS holes that are subsequently reamed. PCOM have voted to have a large-diameter (reamed (?)) hole at each DCS site for high-technology logging. A larger hole would admit a wider range of logging tools and would allow more effective circulation for hole cooling. However, in the absence of a proven larger-diameter (reaming) capability, it is important that all options be kept open.

DMP, through Recommendation 89/17 made immediately following the joint DMP/LITHP meeting in Windischeschenbach in September 1989, have requested that the logging contractor develop a high-temperature (but not necessarily slimhole) logging capability to address as many as possible of the following priorities, listed in decreasing order.

1. Temperature
2. Borehole Fluid Resistivity
3. Formation Resistivity
4. Natural Gamma
5. Sonic
6. Caliper
7. Flowmeter
8. Borehole Fluid Pressure

DMP added that these objectives are to be achieved by adapting existing tools, not by the development of new tools. Thus, the DMP recommendation is in accord with the PCOM directive to LDGO.

Anderson reported on progress to date. In view of the high expected temperatures, memory tools were preferred. A beneficial option might be to duplicate the Sandia memory tool for measuring temperature and pressure. This is rated to 400°C. An estimated $50,000 is needed so that Sandia can be subcontracted to adapt this (slimhole) tool for ODP use. Time required for building and testing is six months. LDGO are exploring ways of initiating a contract.

For formation resistivity a possible option is to double-dewar the ex-ARCO resistivity tool at an estimated cost of $20,000. This tool requires a cable but it could be logged going down. The prospect of success would be enhanced if a hole-cooling option could be provided. This would require a larger diameter hole (6 inches).

A continuous lc of borehole fluid resistivit is conceptually straightforward out there might be engineering problems. The feasibility of adapting a simple tool should be evaluated.

[ACTION: LYSNE]

Lysne noted that the cost of meeting objectives 1-5 of the list drawn up by DMP/LITHP would exceed $1,000,000. Even if the money were available, the tools could not be developed within the available time.

DMP Consensus

In reiterating its earlier recommendations on high-temperature logging (89/17 - 89/19), Panel noted that the target for the short-term development of high-temperature logging technology was now February 1991. Within this shorter time f ne the high-temperature slimhole logging needs of the DIDES Lithosphere Panel in connection with EPR objectives cannot be fully met. The situation might be eased if reaming were a proven option under EPR conditions. In the current absence of this option, there is a need to draw up a schedule of realistic developments for different diametral constraints. This task is charged to a subgroup to meet after this DMP meeting. The minimum target should be those LITHP objectives which are the most readily achievable : temperature, formation resistivity and borehole fluid pressure. In addition, borehole fluid resistivity measurements should be investigated.

DMP Recommendation 90/2

"Facilities be created to allow the development before February 1991 of a slimhole high-temperature downhole-measurement capability at least for temperature, formation resistivity and borehole fluid pressure, together with borehole fluid resistivity if technically feasible. This development is to be based on adapting existing tools."

DMP Recommendation 90/3

"The reaming option for hole enlargement from four to six inches in diameter under EPR conditions should be fully tested."

The Chairman reiterated DMP's support for the recommendations of the Sedimented Ridge DPG and asked for a review of progress to date. These recommendations were considered in turn.

(i) The Barnes-Uyeda tool be modified for higher temperatures (up to 200°C) and be made stronger.

Progress to date

A new WSTP tool is being ordered from Ross Barnes. The WSTP is deployed by wireline after coring, is pressed into the hole floor, and can be decoupled from the pipe to avoid heave.

The new tool is rated to 100°C, has a larger water-sampling capability than the earlier version, and has a bigger chamber for the electronics. It is due for delivery in February 1990.

For high temperatures the strategy has been to retain the WSTP principle and to modify the components. The new version of the 100°C tool needs to be established first. For this reason, no money has been set aside for temperature re-specification. An obvious requirement will be titanium housings because H_2S can be expected in sedimented ridge environments. The high-temperature WSTP will be designed for operation at up to 200°C.

(ii) A slimline self-contained probe be developed or acquired to measure temperature up to 350°C.

Progress to date

This objective could be fully met through the adaptation of the Sandia temperature/pressure tool mentioned earlier.

(iii) A high-temperature fluid-sampling capability be developed.

Progress to date

High-temperature sampling of borehole fluids can be based on the Kuster sampler, currently rated to 350°C, but with different materials. Options are being evaluated.

A possibility is the Los Alamos tool which is a flowthrough, clock-operated, mousetrap-closure device manufactured entirely from a corrosion-resistant alloy of titanium. There is no communication with the tool during deployment. The tool was run in the KTB pilot hole in late 1989.

A second high-temperature tool, from U C Berkeley, departs from the Kuster principle by using a conductor cable. The tool is rated higher than the cable at 350°C.

Finally, the downhole determination of permeability was considered. The ODP straddle packer could be modified for use at 200°C but this would require special elements. An option for extending to higher temperatures might be to use a single packer in the casing and to carry out interval tests at intermediate drilling depths. Yet another alternative might be flowmeter-plus-injection surveys. Panel did not take a position on the high-temperature permeability issue, preferring to keep the options open at this stage.

Working Group Report

Following the main Panel meeting, many members stayed on for a special thematic session on high-temperature logging. Their deliberations were based on the foregoing information. The actions are reported here for consistency and completeness. Two principal actions were identified.

DMP National Representatives are asked to collect from within their countries all available data on the high-temperature tools that currently exist. Data should include tool diameter, temperature and pressure ratings, compatibility with Schlumberger tool connections, and whether the tool would be available on lease to ODP. This information should be sent to DMP Chairman no later than 30 April 1990.

[ACTION: NATIONAL REPRESENTATIVES]

This will allow time for the material to be synthesized and mailed out to DMP members with the agenda for the next DMP meeting.

[ACTION: WORTHINGTON]

There is a need for a long-range development plan for h[illegible]h-temperature technology. This should be based upon the ODP long r[illegible]e plan. The latter should be scrutinized and logging needs ex[illegible]acted. This information should be incorporated with pertinent messages from the JOIDES thematic white papers. Cost estimates should be produced and priorities listed. The task of developing a long range plan for high-temperature logging was assigned to a working group comprising Anderson, Worthington, Lysne and Sondergeld. The group may need to meet once in April in order to agree and finalize its submission.

[ACTION: ANDERSON, WORTHINGTON, LYSNE, SONDERGELD]

The aim is to mail the long range plan to DMP members with the agenda for the next Panel meeting.

[ACTION: WORTHINGTON]

The next DMP meeting will contain an agenda item which will address the comparison of the long range high-temperature logging plan with the reports of the national representatives. This will allow the identification of those scientific needs which are not accommodated by existing technology. Panel will develop a target list of required long-term technological developments for high-temperature logging.

13. <u>Shipboard Computer Applications</u>

Anderson outlined the current status from an LDGO perspective. A microvax had been purchased by LDGO with the intention that this would be dedicated to shipboard FMS processing using Schlumberger software. Without this processing facility, it would not be possible to provide FMS images corrected for speed and depth while the Leg itself was still underway. The estimated microvax processing time per FMS log is 30 hours. Unfortunately, the LDGO shipboard team had been unable to commission the microvax which has now been returned to LDGO so that the system can be rendered operational. The estimated time required to achieve this objective is two months. When the microvax is returned to the ship, LDGO staff will not have the experience to maintain the hardware.

Anderson is asking for TAMU help in providing the necessary operational support and maintenance. In the meantime LDGO are able to produce FMS images for shipboard use but these are not corrected for depth and speed.

Anderson also commented that the downhole measurements laboratory is not actively connected to the TAMU shipboard computer network (ETHERNET) at the present time. A log tape has to be physically carried from the downhole measurements laboratory to the vax installation. If logs are to become part of the itegrated shipboard database on the vax cluster, a computer link is essential. At present all log data are stored on MASSCOMP. This does not allow database interrogation so that selected logging data might be merged directly with core data.

Merrill reported that the logging system had been disconnected from the TAMU shipboard computer network because the shipboard computers could not handle the enormous amount of FMS data that it was proposed to transmit. The situation could be alleviated by the purchase and installation of an ETHERNET bridge which would constrain data transmission.

Anderson reported that it was no longer the intention to transmit FMS data through ETHERNET. Therefore, there was no danger of the system becoming overloaded if the downhole measurements laboratory was reconnected.

Merrill commented that the integration of logs into a vax database was a software problem. There is no point in transmitting log data to the vax cluster if there is no software data management system in place to allow the information to be interrogated. In turn, this software cannot be developed until there is an agreed user definition of output requirements.

Merrill further noted that operational maintenance for the TAMU shipboard computer system was derived through TAMU's subscription to a maritime maintenance agreement with Digital Equipment Corporation (DEC). LDGO had not become a party to this agreement without which the logistics of shipboard maintenance for the LDGO computers were difficult.

The Chairman asked what action could be taken to improve the shipboard computer situation as it pertains to downhole measurements. Merrill proposed three courses of action.

(1) The FMS-dedicated microvax and other downhole-measurement computers be incorporated into the shipboard VAX network (in view of the stated intention that FMS data would not be transmitted through ETHERNET).

(2) LDGO join with TAMU in the maritime maintenance agreement with DEC. (This currently costs around $18-22,000 in total and is unlikely to cost LDGO incrementally more than $5-6,000.)

(3) The FMS-dedicated microvax be located in the machine room where the TAMU system managers will provide back up. (However, the system managers are not conversant with Schlumberger software.)

Anderson welcomed and concurred with these courses of action.

Panel synthesized its overview of the above discussion into the following recommendation.

DMP Recommendation 90/4

"TAMU and LDGO should work towards an integrated shipboard computer system which accommodates all log and core needs. An immediately identifiable goal is that log and core data be easily and simultaneously accessed, displayed and interrogated through one database management system."

Noting the observation that user requirements have to be specified before a data management software system can be developed for the integration of log and core data, and in view of the fact that IHP is responsible for recommending software usage, DMP formulated the following further recommendation.

DMP Recommendation 90/5

"Representatives of DMP, IHP and SMP should meet in a workshop session to identify user needs and develop data presentation styles for integrated log and core data. This workshop should take place before the proposed DMP/SMP joint meeting in October 1990."

It was hoped that IHP and SMP would lend support to this initiative at their joint meeting in March 1990. Thereafter PCOM and JOI support for the workshop should be solicited.

[ACTION: WORTHINGTON]

The workshop session should be scheduled no later than August 1990. The product should be a "strawman" user definition of output requirements for the integration of core and log data. In addition to the Chairman, three other DMP members offered to participate, in one case by proxy : they were Hutchinson, Sondergeld and Wilkens.

14. <u>Tool Monitor Reports</u>

(i) Geoprops Probe

Karig reported that the entire tool is currently laid out prior to assembly, some minor changes are contemplated, and the current schedule provides for quick testing by mid-April. However, the unofficial aim is to try to complete the tool in time for Nankai. TAM, Inc, have agreed to accelerate development to the best of their ability. The chances of achieving the Nankai goal are slight.

(ii) LAST

Crocker reported that LAST-I is ready for use on Leg 131. Calibrations have been completed at onshore test sites. Because the onshore tests are at lower absolute pressures, the pressure transducer will be replaced for use on ODP. This replacement will be done by the end of January, followed by a final pressure test. Moran will transport and operate the tool on the Leg for its first use in ODP.

LAST-II components are completed (data collection module and pressure meter module). The final assembly is now underway at Fugro/McClelland in Houston and the onshore test will be done in Houston during the week of 29 January 1990.

(iii) VSP Nankai

No information available.

(iv) Long-term temperature tool

Kinoshita reported on progress towards the Nankai downhole observatory. The system comprises a thermistor cable with pressure and temperature gauges at top and bottom. Satisfactory tests have been carried out under temperature- and pressure-controlled conditions in the laboratory, in lakes and in the sea. Preparations for deployment are currently taking place in Guam.

(v) BGR borehole magnetometer

The Chairman read a letter from PCOM Chairman concerning the high-resolution, high-temperature (200°C) borehole magnetometer, developed by BGR of FRG, which is expected to be available in mid-1990.

Bosum and v. Rad have suggested that the first field trial be carried out in the deepened 504B. PCOM Chairman has asked for DMP's recommendation.

Panel noted the absence of good three-component magnetic data available from 504B. Therefore, the German proposal makes sound scientific sense. Furthermore, the expected bottom-hole-temperature in 504B after deepening is 200°C. This would not impede deployment of the tool.

DMP Recommendation 90/6

"The BGR of FRG high-resolution borehole magnetometer should be scheduled for deployment in Hole 504B after deepening."

15. Workshop on Log Data Quality

Progress towards fulfilling each of the 20 recommendations of the workshop held in Washington D.C. in April 1989 was not discussed. It was agreed that the Chairman would request JOI Inc, under whose auspices the workshop was convened, to approach for status reports the various parties at whom recommendations were directed. These would be reviewed at the next Panel meeting.

[ACTION: WORTHINGTON]

16. Wireline Packer

Larry Sanford (President of TAM, Inc) reviewed the background to the wireline packer. Through TAM's work for the oil industry, the company had become foremost in the development of inflatable packers that could "pass through the eye of a needle and inflate in the Houston Astradome". TAM had previously supplied permeability packers (1985) and a drilling packer (1986) to ODP. The contract for the wireline packer was signed in 1987.

Sanford reported that TAM had grossly underestimated the time taken to develop the wireline packer which had proved to be one of the most demanding projects they had ever undertaken. Although two tools, less the inflatables, had been made in under 18 months, there were problems with the pumps and motors. An improved pumping system was needed. This took a year to develop. Another improvement was to section the tool into four eleven-foot components joined by quick (dis)connects for easy handling. The tools have been tested under drawdown, not injection, conditions.

Two functioning wireline packers have been delivered to LDGO. Enquiries have been received from industry. TAM are currently manufacturing two assemblies similar to the ODP tools for lease by a major oil company. This is a clear benefit from ODP to industry for, without the ODP push to develop the prototype, the technology would not now be available for commercial use.

LDGO are to carry out an acceptance test on the wireline packer. These tests are scheduled for completion by 18 March 1990. The tools will be run in LDGO wells in the Palisades Sill. They will be deployed in several different sizes of casing to study inflation/deflation performance.

A higher temperature version is theoretically possible. The present electronics are rated to 100°C but the tool could be modified to run at somewhat higher temperatures. For example, it could operate as a single, rather than a straddle, packer.

The wireline packer is expected to be ready for deployment during Leg 131.

In response to an earlier Panel request, Anderson furnished the following chronology for the wireline packer.

February 1987

Contract issued to TAM for two wireline packers.

October 1987

In response to upcoming Leg 118, TAM offered a prototype tool (ahead of schedule) but without any testing. Review of the tool by Mark Zoback and Jorg Baumgartner (of Stanford) and Keir Becker (who would run the tool on Leg 118) indicated that although the chances of it working were quite small, it would be useful to have it on the ship in case the standard packers failed. As it turned out, the standard packer tests went quite well on Leg 118 and there would have been no requirement to run the wireline packer. This was especially fortunate as the wireline packer electronics were damaged during shipboard testing and the tool would not have worked if it had been needed.

January 1988

Tool returned to TAM for further development and completion of prototype.

September 1988

Zoback informed by TAM that the tool was nearly ready for field testing.

October 1988

Baumgartner and Erich Scholz of Stanford conduct a thorough evaluation of tool readiness. They identified a number of problems with the tool. While many of these problems were minor and easily solved, residual major problems were insufficient power from the electric motor in the tool and an inadequate flow rate from the pump.

January 1989

To try to break through the problems TAM were having with the pump and motor, Zoback and Larry Sanford (President of TAM) visited Amoco in Tulsa to see if it was possible to incorporate Amoco's proprietary pump and motor technology into the TAM tool. TAM undertook development of a pump and motor similar to those used by Amoco.

March 1989

Baumgartner and Scholz visit TAM again to review status of tool development.

May 1989

New, custom-built motor delivered to TAM.

June 1989

New pump completed and bench testing commenced.

August 1989

Packer testing in casing at TAM plant commenced. Zoback visits TAM to review tool status.

October 1989

Casing tests completed; search for appropriate field test site.

November 1989

Field testing at an Amoco test well in Oklahoma. Scholz attended the tests. Due to very heavy mud in the hole the packer was clogged and did not work properly. Scholz accompanied the tool to TAM for training and testing.

December 1989

Scholz participates in approximately one month of extensive training, attends casing tests (at TAM) of both wireline packers, and collaborates on final minor tool modifications.

January 1990

Tools shipped to Scholz, working at Lamont, for final field testing in the Lamont test boreholes prior to sending the tools to the ship. Scholz will go to sea to run the tool and train ODP personnel.

17. WPAC Planning

Golovchenko reported no further changes in the DMP-recommended logging programme.

Interest has been expressed in using the wireline packer to obtain water samples during Leg 133, N.E. Australia. The feasibility of this depends upon the tool performance during Leg 131 where the packer is to be deployed in casing only because of anticipated poor hole conditions. Every effort will be made to accommodate this request.

There is a vacancy for a JOIDES Logging Scientist on Leg 134, with no restrictions of nationality. In general, ODP/TAMU would be pleased to receive nominations of prospective candidates for future logging scientist positions. Panel members are encouraged to identify and solicit names.

18. CEPAC Planning

One major change has occurred. Leg 138, Eastern Equatorial Pacific, no longer has basement sites in the drilling programme. This will impact adversely on the proposed stress measurements. In order to re-establish the basement objectives, a drilling proposal would be needed for rotary drilling to basement and setting a re-entry cone. This would take an estimated three days.

DMP Consensus

In accordance with its adopted thematic thrusts, Panel reiterates its commitment to the creation of a database of global stresses. Panel regards the removal of basement objectives from Leg 138 as a potential loss of opportunity.

The matter is to be pursued through the World Stress Map Project of the International Lithosphere Programme.

[ACTION: STEPHANSSON]

19. Downhole Measurements at 504B during Third Engineering Leg

Becker reported that the Third Engineering Leg (136), scheduled around March 1991, has provision for 30 days of operations at 504B. The principal aim is to clean out the hole. If successful, a subsequent Leg (139) will be dedicated to deepening 504B. If unsuccessful, the efforts to clean will be truncated and there is then an option to commence drilling a second hole adjacent to 504B.

Hole 504B has the greatest penetration into basement of all ODP holes. It is important that a full suite of downhole measurements be obtained. Although fairly comprehensive, the existing suite needs to be augmented especially through recently-developed logging tools such as the FMS.

The proposed additional measurements are:

(a) Before engineering work

Temperature, fluid sampling and drillstring packer deployment.

(b) Before recasing

FMS, wireline packer, flowmeter packer, enhanced resolution tool and sidewall coring.

Becker outlined three options for carrying out these additional measurements:

(i) during Leg 136;
(ii) shared between Legs 136 and 139 if 504B is re-opened;
(iii) during a minileg or segment of the alternative EPR Leg 139, if 504B is not re-opened.

Panel concurred that all the proposed downhole measurements should be undertaken in order to complete the database at this important site and also to allow further science to take place.

DMP Recommendation 90/7

"Downhole temperature measurements, fluid sampling and drillstring packer experiments be carried out in Hole 504B during the third engineering leg (136) and before any engineering work is undertaken."

DMP Recommendation 90/8

"The following programme of downhole measurements, which complement existing data, should be carried out at Site 504B before recasing:

Formation Microscanner
Wireline Packer
Flowmeter Packer
Enhanced Resolution Tool
Sidewall Coring (possibly through wireline re-entry)

Options are to undertake this work during the third engineering leg (136), during a subsequent leg (139) dedicated to 504B, or during a subsequent minileg or segment of an EPR leg."

20. Lithosphere Characterization

The Chairman re-introduced the concept of a DMP-driven scientific initiative to characterize oceanic lithosphere at a multi-borehole site through detailed downhole measurements and interwell studies. The aim is to answer the questions "To what extent is an ODP drillhole representative of its locality/region? Is it merely a sample of a wide range of in-situ characteristics?"

Methods/techniques to be employed would include a full suite of downhole measurements in each borehole at a multi-hole site, comprehensive laboratory measurements of physico-chemical properties, borehole geophysics such as VSP, long-spacing electric log, etc., interwell acoustic and electrical tomography and tracer studies, all linked to detailed surface geophysics.

While there was general support for the concept, Langseth pointed out that there may be objections to a panel putting forward a drilling proposal. A solution would be to create a working group of panel members which met separately. The drilling proposal could then be submitted in the names of the proponents as individual scientists, rather than as members of the panel.

Morin pointed out that the RIDGE programme may have an interest in the concept since a ridge crest would be a possible target area for the study. Either way, he would like to participate in the working group. Other suggestions included targeting the programme around 504B which has already been well studied.

The Chairman said that he would try to progress the working group idea. Panel members who wished to participate should advise him accordingly. The matter will be discussed more fully at the next DMP meeting.

[ACTION: WORTHINGTON]

21. COSOD I Objectives

Deferred to next meeting. LDGO Liaison is asked to prepare a summary listing of COSOD I objectives together with notes on how these have been addressed/met through logging.

[ACTION: LDGO LIAISON]

22. Openness of ODP

Not discussed.

23. Panel Membership

A replacement is sought for Eddie Howell who left DMP at the end of 1989. The appointed "search committee" of Hutchinson, Worthington and Sondergeld discussed their prospects and identified a course of action. In accordance with PCOM policy, no names are being minuted. The aim is to propose an identified person, who is willing and able to serve, for PCOM approval at their next meeting.

[ACTION: HUTCHINSON, WORTHINGTON, SONDERGELD]

24. Measurement-while-Drilling

The Chairman raised the question of whether DMP should encourage the development of MWD technology for deployment in ODP phase 2. Panel view was that MWD is here to stay. At present it is incompatible with the DCS concept and it will be years before high-temperature systems are proposed. Nevertheless a realistic future logging scenario might be reconnaissance logging through MWD (natural gamma, resistivity, density, neutron and sonic) followed by wireline characterization logging over key intervals identified by the MWD logs. It is not realistic to propose that ODP develops its own MWD technology. A better course of action would be to keep abreast of the evolution of this technology so that ODP can be ready to draw upon it at the appropriate time.

DMP Consensus

Measurement-while-Drilling (MWD) technology should be very closely monitored as a basis for evaluating its possible deployment in ODP phase 2.

DMP Recommendation 90/9

"The logging contractor through LDGO and on behalf of ODP should become a corporate member of the Conoco-led industry consortium for the testing of MWD and other downhole-measurement tools. This will require that $30,000 be budgeted for FY91."

25. Integration of Core and Log Data

This matter has already been dealt with under Agenda Item 13, specifically through DMP Recommendation 90/5 and the subsequent actions.

26. Next DMP Meetings

Several members of the Panel are at sea during Leg 131 which ends on 2 June 1990. This suggests that DMP should not meet during its usual month of May. Yet, it would not be appropriate to defer beyond June. A compromise would be to meet at the very end of June, allowing Nankai participants the courtesy of a three-week recuperation period.

The next DMP meeting will take place on 28-29 June 1990 in Seattle, Washington. D Cowan to host.

The subsequent DMP meeting is tentatively scheduled for 9-12 October 1990 in Brisbane, Australia. This four-day meeting would encompass a visit to the JOIDES Resolution and a one-day joint meeting with SMP. Date adjustments will have to be made if the schedule of the JOIDES Resolution changes.

27. Synthesis and Thematic Publications

Becker reported that the JGR volume containing a thematic set of downhole-measurement papers, derived from a poster session at the 1988 fall AGU meeting, is shortly to be published.

The Chairman emphasized the need to maintain the technical profile of ODP, especially in view of the pending renewal negotiations. He suggested that the Basin Research paper on "Scientific Applications of Downhole Measurements in the Ocean Basins" be followed by a second paper on "Scientific Benefits ... ". A possible nucleus for such a paper is the presentation material used by the Chairman for a paper on the scientific benefits of downhole measurements in ODP within the ODP Union Session at the 1988 fall AGU meeting. This initiative should be pursued. The Chairman asked Anderson to share this task with him and invited any Panel members who wished to be active co-authors to come forward.

[ACTION: WORTHINGTON, ANDERSON]

28. Other Business

No new business.

29. Close of Meeting

The Chairman thanked Members, Liaisons and Guests for their contribution to the meeting, ODP/TAMU for their kind hospitality, and Dr A Fisher for his gracious hosting. The meeting closed at 3.25 pm on Wednesday, 24 January 1990.

PAUL F WORTHINGTON
7 February 1990

REPORT ON MEETING OF JOIDES SHIPBOARD MEASUREMENTS PANEL

Lamont-Doherty Geological Observatory
Palisades, New York

2-3 October 1989

1. Preamble

This meeting was attended in the capacity of Liaison from the JOIDES Downhole Measurements Panel (DMP) to the JOIDES Shipboard Measurements Panel (SMP). This report addresses those aspects of the SMP meeting which have implications for the ODP downhole measurements programme.

2. Standardisation of Shipboard Measurement Procedures

The need to standardise shipboard physical properties measurement procedures, e.g. for density and resistivity, is to be addressed through the formation of an ad hoc working group. This might best be done through a workshop along the lines of the recent DMP-driven workshop on improving log data quality through better data acquisition procedures. Participants would be former JOIDES physical properties scientists. Preferred scheduling is post-Nankai to allow input from that leg, which has a strong physical-properties emphasis.

3. Status of Shipboard XRF and XRD

Both XRF and XRD are working well. There has been concern that the XRD is not user friendly but, where there has been a strongly interested XRD scientist on board, it has proved an effective facility. When XRF and XRD are running together, substantial technical support is needed. At present there is no dedicated technician for XRD/XRF which constitutes an important laboratory complement to geochemical logging.

4. Computerised Core Barrel Data

A preliminary design of computer-generated barrel sheet was presented. All biostratigraphic data have been removed. Provision was made for three open tracks for plotting core data, e.g. P-wave velocity, and/or selected wireline log data, e.g. formation microscanner images which have a similar vertical resolution to core data. It is important that the real-time generated log data are compatible with this format. It is envisaged that the ultimate data storage system, of which the core barrel sheets provide a selective summary, would allow composite log-core comparison plots to be generated for any measured parameters.

5. Visual Core Description

Several technical improvements to visual core description were identified:

- digital colour scanner
- bench-top, automated XRD for routine compositional analysis
- video scanner
- image analysis of smear slides
- computer forms for data entry

6. Relevant DMP Messages

Five messages from the recent DMP meeting on 11-12 September 1989 were identified by DMP Liaison.

- The formulation of a Job Description for the JOIDES Logging Scientist, which might be a precursor to one for the JOIDES Physical Properties Scientist.

- High temperature logging remains the biggest challenge facing DMP : physical properties of core from these environments might have to be measured at high temperatures (and pressures) if they are to be meaningful.

- The deployment of the Formation Microscanner has been a major success : a laboratory image of core might be needed for correlation and orientation.

- A 1990 DMP science initiative is being pursued on lithosphere characterisation through interwell studies : this should involve SMP through the need for some calibrating laboratory physical properties.

- DMP hope to meet at a ship port-of-call in 1990. DMP also hope to hold a joint meeting with SMP. Both objectives could be achieved if DMP and SMP meet simultaneously in Brisbane in October 1990. Preliminary soundings have indicated that this is a viable proposition.

7. DMP Working Group on Physical Properties

Earlier recommendations of the ad hoc DMP Working Group on Physical Properties were summarised. Key points were as follows.

- For each parameter measured downhole there should be a corresponding measurement on board ship.

- Two types of shipboard data should be obtained, scanning of whole core and detailed measurements of core plugs.

- The major development need is for a core orientation facility.

- A spectral gamma sensor is needed for core-log depth merging.

8. Developments

The following developments were identified as highly desirable.

- A magnetic susceptibility tool to be run as a standard log, to complement the (excellent) shipboard physical properties data.

- A laboratory natural gamma (spectral) facility for sensing whole core, to facilitate the integration of log and core data.

9. Preparation for 1990 DMP/SMP Joint Meeting

A white paper should be prepared by each panel outlining measurement needs, capabilities and limitations both now and projected into the future. These should provide a framework for the joint discussions on log-core integration. The structure of each white paper should conform to the following general format.

- Nature and importance of scientific problems (from thematic white papers).

- What is needed to be measured?

- Development status and schedule (refer to Third Party Tool classification).

- Development costs.

Both DMP and SMP should initially prepare a list of the measurements that ought to be made. These lists should be merged early in 1990. The merged list should be used as a basis for the white papers.

10. Report of Sedimentary and Geochemical Processes Panel

Some dissatisifaction with the Barnes sampler was based on its perceived ship-time inefficiency, the fact that it returns only one sample per trip, its lack of reliability, and the risk to the entire hole in the event of massive failure. Although this criticism seems somewhat severe, the newly-designed pressure core barrel, which is still under development, was seen as potentially providing the most reliable fluid samples and thence geochemical data.

11. XCB in Accretionary Wedges

The XCB coring technique damages recovered core by breaking it up into "biscuits and gravy". This means that laboratory physical properties are unlikely to be useful for log calibration and correlation in friable lithologies. This might be a serious problem in accretionary wedges, e.g. Nankai.

12. Core Photocopier

A specially modified core copier, designed to produce a paper image of the outside of the core, has been recommended for acquisition. This would allow correlation with Formation Microscanner images and hence core correlation. Such a facility is in use at the German Continental Deep Drilling Project (KTB).

13. Vertical Seismic Profiles

A USSAC meeting held in Spring 1989 concluded that there should be a US national VSP laboratory with commitment to acquiring, processing and interpreting ODP VSP data, as previously encouraged by DMP. SMP endorsed that encouragement. As yet, the laboratory has not been identified. USSAC also indicated that some funds would be available for VSP tool purchase. USSAC felt that these initiatives would help to "regularise" the deployment of zero-offset VSP in ODP. DMP are responsible for the deployment rationale of all downhole measurements : this includes VSP. SMP are responsible for shipboard handling of geophysical data. DMP view remains that VSP should be run only in response to scientific needs. SMP view is that shipboard facilities are adequate to handle VSP data as needed. Both panels subscribe to the philosophy of the acquisition and integration of physical data measured at different scales. VSP is an important part of this philosophy. The establishment of a national VSP centre would encourage VSP data acquisition.

14. Next SMP Meetings

Target dates (venues) are February/March 1990 (TAMU, College Station) and October 1990 (Brisbane). The latter is to be a joint meeting with DMP during ship port-of-call.

PAUL F WORTHINGTON
5 October 1989

PFW/ECB

REPORT ON INTERPROGRAMME SCIENTIFIC MEETING ON SLIMHOLE HIGH-TEMPERATURE BOREHOLE LOGGING

Texas A & M University
College Station

16 November 1989

1. Attendees

The meeting was attended by representatives of the Ocean Drilling Program (ODP), the U.S. Continental Scientific Drilling Program (CSDP), the programme for Deep Observation and Sampling of the Earth's Continental Crust (DOSECC), the U.S. Department of Energy (DoE) and the U.S. National Science Foundation (NSF). In attendance were:

T E Pyle	(ODP/Joint Oceanographic Institutions (JOI), Inc.)
A Fisher	(ODP/Texas A & M Univ.)
L E Garrison	(ODP/Texas A & M Univ.)
M C Gilbert	(DoE/Texas A & M Univ.)
D Goldberg	(ODP/Lamont-Doherty Geological Observatory)
B W Harding	(ODP/Texas A & M Univ.)
E R Hoskins	(DOSECC/Texas A & M Univ.)
P Lysne	(CSDP/Sandia Laboratories)
B T Malfait	(NSF)
R Moberly	(ODP/JOIDES Planning Committee/Hawaii Institute of Geophysics)
C Otte	(DoE Geothermal Program/UNOCAL Geothermal Division)
E Pollard	(ODP/Texas A & M Univ.)
M A Storms	(ODP/Texas A & M Univ.)
H Wollenberg	(DoE Geothermal Program/Lawrence Berkeley Lab.)
P F Worthington	(ODP/JOIDES Downhole Measurements Panel/BP Research)

2. Objectives

The aim was to take a preliminary overview of technical issues pertaining to the logging of small diameter (4-inch) holes in hot (> 300°C) environments, and to identify ways in which any common perceived technical shortfalls might be addressed to the maximum benefit of the scientific community through a cooperative development programme.

3. Philosophy

Barry Harding (ODP/TAMU) set the scene by commenting that drilling and logging are integrated engineering sciences and should be approached as such. From the ODP standpoint, the development of a 4-inch Diamond Coring System (DCS) for hot environments will necessitate developments in logging technology.

4. ODP Structure

Tom Pyle (JOI, Inc.) gave an overview of the structure of ODP. A key issue has been the desire to broaden visibly the contact with other programmes.

5. CSDP Drilling and Logging Technology

Peter Lysne (CSDP) reviewed CSDP drilling efforts. CSDP represents three parties, the U.S. Geological Survey (USGS), DoE and NSF. CSDP logging requirements include logging in slim holes with high core recovery (similar to the ODP Diamond Coring System which is under development).

Large Holes:	Cajon Pass (cool) ODP - like logs used with success.
	Salton Sea (hot, 350°C) ODP & USGS tools used with limited success; most problems at greater depths.
Slim Holes (limited core):	extensive temperature logs successfully run.
Slim Holes (high core):	log for those parameters that cannot be obtained from core. Even this limited goal has not been attained.
CSDP Priorities:	core, temperature logs and fluid samples are of prime importance.
	In-situ stress, fracture orientation and [illegible]k property logs are needed.

Novel engineering applications include the use of the borehole televiewer (BHTV) for identifying zones of lost circulation.

A major problem is what happens above 300°C. Memory tools (temperature/pressure, natural gamma) are being developed in order to overcome cable problems and these might be rated to 500°C. Fluid samplers are available to 400°C but further refinements are needed. Directional survey tools are being developed to 350°C.

In reality, 400°C is a useful target specification which will cover most of the situations that might be encountered.

Prognosis for memory tools:

Straightforward	gamma-gamma density neutron porosity
Medium difficulty	normal resistivity acoustic natural gamma spectral

Difficult	televiewer focussed electric
Very difficult	pulsed neutron tools induction
Exceedingly difficult	geochemical logging tool

6. ODP Drilling Technology

Mike Storms (ODP/TAMU) reviewed ODP drilling and coring technology. The standard method is still the rotary core barrel (RCB). The advanced piston corer (APC) has been developed for improved recovery in softer sediments : there is no rotation involved. The extended core barrel (XCB) is used to core harder sediments : the cutting shoe is ahead of the main bit to facilitate core recovery. The XCB has recently been modified for deployment in even harder sediments. RCB, APC and XCB are wireline coring systems.

The Navi-drill core barrel (NCB) is also a wireline-retrievable core barrel. The NCB system penetrates ahead of the XCB bit as coring commences. NCB produces a slightly smaller core. NCB enables diamond coring bits to be used within the operating window for which they were intended. NCB will also allow the Geoprops Probe to be emplaced.

A bare-rock guidebase has been deployed for bare-rock drilling, eg. near ridge crests.

A diamond coring system (DCS), based on the experience of the mining industry, is being developed with a top-drive concept. This is to be used in conjunction with a re-entry cone to secure a better core recovery in hard rock than has been achieved using ODP standard technology which is derived from the petroleum industry. Once again, DCS has a wireline-retrievable core barrel.

7. ODP Logging Technology

Paul Worthington (ODP/JOIDES Downhole Measurements Panel) gave an overview of current ODP logging capabilities. These comprise "standard" logs which are run routinely and "special" tools which are run according to particular scientific demand. Tool diameters are $3^5/_8$" and tools are rated to 170°C except where indicated. The logging cable is rated to 150°C.

Standard Logs

Three tool strings are used which include:

(i) Seismic-stratigraphic string:

Dual induction	(resistivity for porosity)
Long spacing sonic	(acoustic velocities)
Lithodensity	(density for porosity)
Neutron porosity	(porosity)
Natural gamma spectral	(depth control, K, U, Th)
Caliper	(hole size)
Temperature (100°C)	(heat/fluid flow)

(ii) Geochemical string:

Natural gamma spectral	(depth control, K, U, Th)
Aluminium clay tool	(Al)
Induced gamma spectral	(Ca, Si, ...)

(iii) Structural string:

Formation microscanner	(high resolution imaging)
Natural gamma	(depth control)

Special Logs

Borehole televiewer	(stress, imaging)
Magnetometer/susceptometer	(magnetics)
Dual laterolog	(resistivity)
Well seismic	(VSP)
Multichannel sonic	(acoustic velocities)
Fluid pressure/sampling	

Future needs for high-temperature slimhole applications would ideally encompass all the above. However, in the real world of ODP, not all standard tools can be slimholed. There is a need for deployment of high-temperature slimhole logs in mid-1991. In order to focus efforts, the following development priorities have been identified for a 4-inch hole with temperatures up to 350°C.

For ODP Logging Contractor (LDGO)

1. Temperature
2. Borehole Fluid Resistivity
3. Formation Resistivity
4. Natural Gamma
5. Sonic
6. Caliper
7. Flowmeter
8. Borehole Fluid Pressure

Items 1-5 are considered vital.

For ODP Science Operator (TAMU)

1. Permeability
2. Pore Pressure
3. Pore Fluid Sampler

In order to address the above logging objectives in the short-term, off-the-shelf logging tools should be re-packaged. These are currently rated to 260°C. Repackaging might achieve the target of 350°C but 300°C is more realistic. Hole cooling might extend the range above 300°C but it is risky. Above 300°C there are also cable problems.

Repackaging might allow some short-term objectives to be achieved but it does not provide a long-term solution. Key tools (eg. geochemical tool) are not available. The community needs a long-term (10-year) assessment of scientific needs so that technical shortfalls can be identified in the ability of logging to meet those needs. These shortfalls should be rectified collaboratively through inter-programme cooperation.

8. The DOSECC Position

Earl Hoskins (DOSECC/TAMU) reported that a new proposal is being submitted for two years' support but only at a very basic level. DOSECC are therefore unlikely to be able to offer any financial contribution to a collaborative logging-tool effort over this period.

9. Available High-Temperature Slimhole Tools

Dave Goldberg (ODP/LDGO) presented the results of a simulation study of the effectiveness of borehole cooling undertaken by Mark Langseth of LDGO. The principal conclusion was that cooling is unlikely to be effective in 4-inch holes because of the limited circulation through the narrow annulus around the tool. It is therefore necessary to use tools rated to 350°C for logging in hot slimhole environments.

A survey of off-the-shelf logging tools for hot and/or slimhole deployment has revealed that only one core service company slimhole tool is rated for temperatures greater than 300°C. This is the Atlas Wireline production logging tool designed for geothermal wells. The tool can operate at 315°C for twelve hours and measures temperature, pressure and flowrate.

Sandia Laboratories have developed a memory tool rated to 360°C that records temperature and pressure as a function of time. The high-temperature electronics developed by Sandia might be available to others.

Since the time to DCS deployment is so short, high-temperature slimhole tools need to be developed now. This should be addressed through the repackaging of existing tools rather than by the development of new ones. Self-contained digital memory units ought to be considered in order to avoid the need for special logging cables. There are good prospects that some of the conventional tools might be packaged and kept sufficiently cool in dewars to allow several of the standard measurements to be carried out.

In the period spanning FY91 - FY92, five of the seven ODP legs will require high temperature tools. Temperature and natural gamma memory tools are available now. In developing others we should concentrate on those measurements which cannot be made on core.

10. Forward Strategy

It was unanimously agreed that joint action should be initiated towards the development of slimhole high-temperature logging technology. To set the ball rolling and establish a suitable profile for the initiative, two actions were agreed.

(i) Tom Pyle to write formal letters of approach to the Inter-Agency Coordination Group (DoE, USGS, NSF) and to the Geothermal Technology Division of DoE. These letters should raise the question of co-funding identified logging developments of joint interest.

(ii) Peter Lysne and Paul Worthington to co-author a technical position paper on high temperature slimhole logging for submission to EOS. The aim is to give the collaborative initiative a high profile within the technical community.

It was generally considered that once the proposal for collaborative funding had been accepted, a detailed work programme would need to be drawn up by an appropriately convened task force.

PAUL F WORTHINGTON
17 November 1989

PFW/ECB

REPORT ON ODP WORKSHOP ON PROGRESS AND OPPORTUNITIES IN GEOCHEMISTRY

UCLA Conference Centre
Lake Arrowhead
California

9-12 January 1990

1. Preamble

The workshop was convened by G Brass (University of Miami) and M Kastner (Scripps Institution of Oceanography). The purpose was to review the status of Geochemistry in the Ocean Drilling Programme (ODP) and to develop strategies for the future. Specific targets were to identify future large geochemical efforts in ODP, to formulate plans and explore tentative proposals, to define effective sampling strategies, to identify necessary new tools, and to assess the potential for long-term monitoring in ODP holes. This initiative was timely because of the recent emphasis on thematic planning in ODP, the emergence of new facilities such as the Geochemical Logging Tool (GLT), and the drive towards higher-resolution sampling. These notes emphasise those aspects of the workshop which have implications for downhole measurements.

2. Structure

Working groups were formed to address each of the following issues which are classified as either scientific themes or data-acquisition technology.

Scientific themes:

- Crustal Alteration (Layer 2)
- Chemical Fluxes
- Global Mass Balance
- Palaeoceanography
- Diagenesis
- Organic Geochemistry

Data-acquisition technology:

- Geochemical Logging
- Downhole Tools and Techniques

3. Thematic Needs

Several broad needs emerged in terms of required downhole technology:-

continuous characterisation of inorganic solids with high spatial resolution;
(high-temperature) packers with samplers and probes for characterising individual horizons;
programme of routine organic geochemical data acquisition.

The technology groups considered the progress made to date in meeting these thematic needs and the opportunities that exist for future advancement.

4. Geochemical Logging

The working group on geochemical logging was led by P F Worthington (BP Research). The following is its report.

4.1 Summary of Recommendations

(1) Continue the policy of routinely obtaining logs with the Geochemical Logging Tool (GLT).

(2) Implement improved procedures for the effective integration of core and log data, requiring XRF and XRD shipboard measurements on samples from log-derived key intervals.

(3) Replace JOIDES logging and physical-property scientists with JOIDES physical and chemical characterisation scientists. Formulate job descriptions.

(4) Quantify intrinsic and field accuracies and precisions for the GLT.

(5) Develop signal enhancement procedure(s) for a target GLT vertical resolution of one foot (30 cm).

(6) Deploy an Enhanced Resolution Tool at the earliest opportunity.

(7) Include a core natural gamma spectral facility on board the JOIDES RESOLUTION.

(8) Investigate the global/regional/local validities of element-to-mineral transforms.

4.2 Introduction

In its broadest sense geochemical logging can provide information relating to the chemical composition of the oceanic lithosphere (both solids and fluids), to the way in which the chemical constituents are distributed, and to those dynamic processes which govern fluxes and flowpaths. Thus, temperature logs, porosity logs (density, neutron, sonic, resistivity), and permeability indicators (eg. sonic waveform logs) all have an interactive role to play. However, for present purposes we are taking a more specific view by focussing on the Geochemical Logging Tool (GLT), developed and operated by Schlumberger, which has already been widely deployed in the Ocean Drilling Programme. We shall consider logs measured using the GLT as "geochemical logs". In so doing, we shall concentrate primarily on the geochemical evaluation of solid rock as opposed to the interstitial fluids. We shall confine ourselves to inorganic geochemistry. Although there are promising indications from the oil industry that carbon/oxygen ratios measured by the GLT (in inelastic mode) can be used to derive total organic carbon (TOC) in sediments, this facility has only received limited application in ODP.

Here our aims are to assess progress made to date, to evaluate what can be done to improve data quality in the short term, and to identify opportunities for further developing the interpretative technology in the future.

4.3 Geochemical Logs

Properly calibrated geochemical logs form an important part of the scientific legacy of an ODP drill hole. They provide a continuous geochemical signature at in-situ conditions and with a spatial resolution of about 2 ft. (60 cm). Geochemical data at this larger scale of measurement constitute a useful basis for the calculation of fluxes. One cannot integrate and extrapolate core data to achieve the same end-product because of the complementary nature of core and log measurements, ie. core data have high resolution but relate to a small volume of rock, whereas log data have lower resolution but relate to a much larger (100 times) volume of rock. The key to successful geochemical characterisation is to use the high resolution, and thence greater accuracy and precision, of core data to calibrate the otherwise less accurate and precise log data.

The logs are not as accurate and precise as laboratory data. However, with core calibration the accuracy and precision of the signature can be enchanced. This is an important point because good geochemical logs are often obtained where core recovery is limited, eg. in (uncased) basement holes, and therefore the logs have to provide meaningful interpolation between core data locations. This continuity is essential for complete geochemical surveys of a drill-hole and for interpolation between sites.

Geochemical logs can provide a geoc[illegible]cal signature in the form of elemental concentrations, miner[illegible] in terms of a pre-specified mineral domain, and [illegible]er derived products such as grain density.

4.4 Geochemical Signature

The geochemical signature takes the form of the absolute concentrations of 12 elements: K, U, Th, Al, Si, Ca, Fe, S, Ti, Gd, H, Cl. The establishment of absolute concentrations of Si, Ca, Fe, S, Ti, Gd, H, and Cl requires post-cruise processing. If core calibration can be incorporated, enhancement of accuracy is possible. Since H and Cl relate primarily to the fluids, they are not considered further. We shall think in terms of a ten-element geochemical signature which can be developed through post-cruise processing.

On board ship, it is possible only to provide a preliminary geochemical signature in the form of absolute concentrations of K, U, Th, and Al, and relative concentrations of Si, Fe, Ca and S (plus H and Cl). This information can be supplied in real time. It has two important uses:

(1) it sets in context the significance of geochemical changes as seen in measurements of (discontinuous) cores;

(2) it serves as a guide to subsequent core sampling for enhancing the accuracy of later determinations of absolute elemental concentrations.

Accuracy enhancement of the geochemical signature requires some controlling laboratory data, such as XRF and XRD. These facilities are underutilised on board ship. This is unfortunate, because core and log data are complementary in terms of resolution and scale. It is possible to derive maximum benefits by using the high resolution core data to calibrate the larger-sampling log data. This aspect will be developed more fully later.

4.5 Mineralogy

The availability of XRF and XRD data allows the controlled progression from the geochemical signature to mineralogy. XRF data allow the assumption of a ten-element domain to be verified. XRD data allow one to determine the 5-10 most common minerals in order to optimise the inversion process. XRD data also allow one to test the appropriateness of the oxide closure model, used to convert relative elemental concentrations to absolute values for Si, Ca, Fe, S, Ti and Gd. If these assumptions are all satisfied, the derived mineralogy will be realistic; if they are not satisfied, the elemental concentrations wil be erroneous and the subsequently determined mineralogy will contain artefacts. The key to controlling the interpretation procedure is the effective integration of core and log data.

Schlumberger claim other derived products that can be determined from the mineralogy. Some of these seem intuitively realistic, eg. grain density and clay types; others are less convincing, eg. permeability. The only derived product we consider is the mineralogy, and that is viewed as subordinate to, and less reliable than, the elemental signature for present purposes.

4.6 Case Histories

Here we give an example of the uses of geochemical logging to solve scientific problems within each of the thematic working groups on inorganic geochemistry established within this workshop.

(1) Alteration of the Oceanic Crust - Layer 2

In Hole 504B, permeability was measured by pumping below packers inflated in the hole. These measurements showed a marked drop in permeability 300 m into the oceanic crust, whereas the porosity values from the electrical resistivity logs indicated continued high porosities. How can high porosities be reconciled with the low permeabilities in the lower pillow basalts of the upper crust? The geochemical logs show strong correlations between (a) high Si and Mg content and low Al and Ca content and (b) high porosity values within this zone of the hole. The geochemical logs are detecting the stoichiometry, or the chemical composition, of clay minerals that were precipitated in fractures and pore spaces as a result of the sealing of hydrothermal circulation. Subsequent sampling and laboratory measurement of core samples verified that these alteration zones contain high cation exchange capacities that account for the "false" porosity indicators.

(2) Chemical Fluxes between the Crust and the Ocean

Also in Hole 504B, the continuous nature of the geochemical log-derived elemental abundances leads to a direct measure of the integrated chemical exchange between the basalts and sea water from bottom to top in the hole. The integrated differences between the compositions of the freshest dikes from the bottom of the hole and the altered basalts from the upper dikes and pillow units show that (a) there has been a significant addition of Si caused by quartz precipitation at the dike-pillow boundary, (b) Al has a lower concentration in the zone of maximum clay precipitation in the lower pillow basalts, (c) Ca is depleted and Mg enriched from the hydrothermal alteration of basalts, just as predicted from laboratory experiments, (d) significant Fe loss is from black smoker and off-axis, ridge-flank advection into the ocean, combined with some primary decrease in Fe and Ti content of the pillow basalts relative to the dike basalts, and (e) the K, which shows strong enrichment in the upper pillow basalts due to low temperature alteration, is derived from depletion in the dikes as well as from extraction from circulating sea water.

(3) Global Mass Balance between Subduction and Arc Volcanism

In the Bonin Arc, geochemical logs record the continuous sequence of arc volcanism back in tme. High-K dacites and rhyolites, found below high Fe and Mg boninites, require a source for the potassium enrichment either from subduction during the Oligocene of high-K oceanic sediments, contintentally-derived high-K sediments or basement rocks, or from massive fractionation of very large volumes of arc tholeiites into boninites and residual dacites.

(4) Palaeoceanography

On the western continental margin of Australia, geochemical logs record the sequence of onlap and offlap of sediments caused by the rise and fall of sea level in accordance with the Vail curve. Chemical changes in the sediments from high Al, Fe, and Ti clastic sediments to high Si sands, then high Ca carbonates, record the fall and rise again in sea level on the margin.

In the Japan Sea, high frequency cyclicity in Al and gamma-ray logs records the changes in climate on mainland Asia that resulted in changes in the flux of windblown dust deposited on the sea floor. The 41 ka periodicity of this log-derived cyclicity identifies the climatic forcing function to be Milankovitch orbital perturbations.

(5) Diagenesis

In the Peru continental margin, the Cl curve from the geochemical logs identified an inversion in pore fluid salinity from more saline fluids above to fresher pore fluids below a prominent seismic reflector. The changes in pore fluid chemistry reflect major causes and effects of diagenetic changes in sediments.

4.7 Integration of Core and Log Data

Calibrated logs are needed to set core data properly in perspective. We propose the following strategy for the effective integration of core and log data for optimised interpretation.

The recommended procedure is to use the preliminary geochemical signature, available on board ship in real time, to identify zones of apparent geochemical consistency within each major litho-unit. For each target zone, XRF and XRD data should be determined at regular sampling intervals (15 cm) and averaged over distances that correspond to the vertical resolution of the logging tool. Appropriate weightings that reflect tool response should be applied. These weightings and the vertical resolution vary between the three groups of elements determined by the three different tools in the same tool string. The averaged core data (XRF and XRD) provide the basic control on refined interpretations of elemental concentrations, and thence inferred mineralogy, which become available post-cruise.

This strategy would be better implemented by redefining the job descriptions of the JOIDES logging scientist and at least one of the two JOIDES physical properties specialists. It is proposed to replace these functions with two integrated functions that cover both logging and laboratory properties. These new functions are:

JOIDES Physical Characterisation Scientist (responsible for the physical properties log and core measurements);

JOIDES Chemical Characterisation Scientist (responsible for geochemical log and XRF/XRD core measurements).

4.8 Opportunities for Future Developments

(1) Accuracy and Precision

There is a need to define the operating limits of accuracy and precision for each element seen by the GLT. Intrinsic accuracy can be determined by comparing measured data with absolute standards, if these exist. Intrinsic precision is governed by the statistics of counting. Both accuracy and precision are degraded by the limited vertical extent and lack of physico-chemical constancy of the target beds. Studies directed at defining accuracy and precision should recognise that the intrinsic quantities might be influenced by variations in composition, while the field-measured quantities might also be borehole-specific.

(2) Enhanced Resolution Tools

It might be possible to determine the concentrations of other key elements, such as Mn and Ba, by adapting the existing geochemical logging tool. Other desirable elements that cannot be readily evaluated through conventional sodium-iodide detectors, as used in the GLT, might include Ni, Cr, V, Sr, La and P. The greatly improved spectral resolution attainable with solid-state detectors would allow some of these elements to be measured. Developments in enhanced resolution tools should be closely monitored with a view to deploying them in ODP at the earliest opportunity.

(3) Deconvolution/Signal Enhancement

A sharper spatial resolution for the GLT might be attained by deconvolution or by using other (high-spatial-resolution) logs to specify the boundary conditions. A one-foot (30 cm) vertical resolution would be a useful target. Any such technique would be retroactive, ie. it could be applied to logs obtained in the past. Among the obvious benefits of a sharper spatial characterisation would be better time resolution in sedimentary sequences.

(4) Element-to-mineral Transform

The applicability of element-to-mineral transforms needs to be established. Is there any case for a global transform and, if not, how extensive an application does a particular transform have? Unless these questions are answered, the use of the GLT to establish mineralogy will have limited acceptance. A key issue is the role of XRD calibration. With this control it might be possible to establish optimum transforms for each principal lithology.

(5) Shipboard Measurement

In addition to XRF and XRD, a core gamma spectral facility should be introduced to assist with core-log depth merging and to provide high resolution K, U, Th data. In the longer term, continuous whole-rock bulk-analysis methods should be encouraged.

(6) Logistics of Core-log Integration

If a casual approach to XRF and XRD data acquisition is allowed to continue, a piecemeal output can be expected. To avoid this situation, specific job descriptions should be developed for the two replacement, scientific positions proposed herein. In particular, it should be incumbent upon the JOIDES Chemical Characterisation Scientist to supply all identified XRF and XRD data to the ODP Logging Contractor as input for the advanced (research grade) processing of the GLT data.

4.9 Conclusions

The GLT is at the appraisal stage. We are still learning how to get the best out of it. The recommendations that have been formulated here will contribute to that goal. Geochemical logs do, of course, form but a part of the package of downhole measurements that are regularly deployed in ODP. The conjunctive use of all core and log data constitutes the optimum strategy for scientific formation evaluation.

5. Downhole Tools and Techniques

The working group on (other) downhole tools and techniques was led by K Becker (University of Miami). The following is its report.

Other than geochemical logs, a number of special downhole tools and techniques will be critical to achieving the scientific goals and priorities outlined elsewhere in this volume. The highest-priority goals include: sampling in-situ fluids and extracting them at in-situ conditions, measuring geochemical fluxes, and determining the flow patterns that account for these fluxes. A variety of samplers and experiments that will contribute towards achieving these goals are presently available or under development for ODP use.

Although the high-priority objectives cannot presently be met, the developments in progress offer great promise for future success, and the workshop encourages the necessary engineering effort. The workshop strongly endorses three particular tools/experiments for the highest-priority development effort:

1. the pressure core sampler
2. packers with fluid samplers and tracer experiments
3. instrumented boreholes with long-term sensors to measure temperature, flow, fluid conductivity, and chemical compositions.

In addition, it is critical that these experiments be engineered to function in the unstable or harsh (high-temperature, possibly corrosive) environments where goechemical fluxes may be most active and interesting.

Another promising new tool for the interrogation of fluids is the Nuclear Magnetic Resonance (NMR) tool.

The following is a summary of the status of geochemical sampling tools and experiments.

(R = routine from drillship: T = tested but not yet routine: D = under development: F = future development: Hi T? = usable or modifiable for use at 350°C: WLR? = possible deployment by wireline re-entry: Y = yes : X = no or not yet).

Tool/Experiment	Status	Hi T?	WLR?
A. Borehole fluids			
Kuster sampler	R	?	?
Gieskes sampler	D	?	Y
B. Sediment pore fluids			
WSTP (Barnes)	R	?	X
Pressure core barrel	D	?	X
APC sampler (?)	F?	?	X
Geoprops probe	D	X	X
C. Hard rock formation fluids			
Wireline packer	T	X	Y
Drillstring straddle packer	R	X	X
Cann OBCAT sampler	T	?	?
Rotatable single packer	T	X	X
'Probeless PWS'	T	X	X
D. Core samples			
Schlumberger sidewall corer	R*	X	Y*
Pressure core barrel (see B)			
Navidrill core barrel	T	?	X
Diamond coring system	D	Y	X
E. Instrumented boreholes			
Unsealed	R	X	Y
Sealed	F	Y	Y

* Schlumberger sidewall corer is routine in industry, but the tool is too large to fit down ODP drill pipe. It could be deployed by WLR, if permitted by Schlumberger.

6. A full workshop report comprising "white papers" from each of the working groups will be issued by JOI-USSAC in due course.

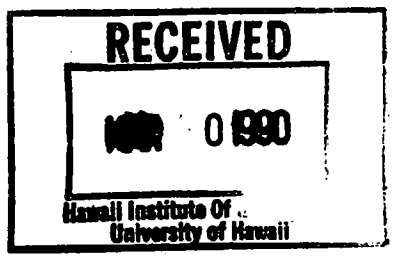
Paul F Worthington
16 January 1990

INSTITUT FRANCAIS DU PETROLE

Direction de recherche
"Exploitation en Mer"

RE 20 ChS/JN Note 17

26 March 1990



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EIGHTH MEETING OF THE JOIDES TECHNOLOGY AND ENGINEERING DEVELOPMENT COMMITTEE (TEDCOM)

Salt Lake City, Utah
14-15 February 1990

Ch. SPARKS

Executive Summary

1. The two day meeting had the following prime objectives:

   - to discuss the development of the DCS-4500 m version
   - to inspect of the DCS in DRECO's yard
   - to discuss ODP deep drilling objectives with representatives of the thematic panels.

2. The subcommittee formed at the previous meeting had met once in Houston on Dec. 4th 1989 to review details of the DCS.

3. New members E. SHANKS and H. SHATTO had joined the committee. A further member with experience of high temperature drilling is being sought.

4. The TEDCOM noted that new ODP depth and penetration records had been set recently but large quantities of drill pipe had been lost as a result of problems with stuck pipe and fatigue.

5. On going work on the MDCB (ex. Navidrill), the side entry sub, the strengthened APC, the modified PCD and the VPC (under development) was presented. A new sampling port and a core piecing 'harpoon' had been added to the PCS at SGPP's demand.

6. TAMU question the reality of high temperature targets (> 350°C) given that geothermal engineers on land only find temperatures upto 250°C.

7. SGPP stressed the importance for them of recovery of undisturbed cores in sand/silt/gravel/rubble, without which, more than 50% of information, significant to SGPP, is sometimes lost.

8. The DCS-4,500 m system was presented. Changes introduced allow the API string to be connected/disconnected at the seabed like a riser. Ways of avoiding potential rotational vibration problems were suggested. A future DCS system without secondary platform but with the API string suspended from tensioners was discussed.

9. Representatives of LITHP, SGPP, TECP presented their technological objectives and particularly those related to deep drilling. The TEDCOM maintains its reserve as to their realism, and favours the creation of a task force composed of members of TEDCOM/TAMU/LITHP to discuss how to proceed. Access to Russian experience of deep drilling/coring must be obtained.

10. The exchange with scientists from the thematic panels was judged to be stimulating and beneficial. The TEDCOM favours further participation by scientists at future (TEDCOM) meetings.

11. Next meetings are planned for Sept. 26-27 1990 in College Station and June 1991 in San Diego (during ship port call).

List of Attendees

TEDCOM members:

Charles SPARKS, Chairman	IFP
Keith MANCHESTER	CGS/BIO
Claus MARX	ITE
Keith MILLHEIM	AMOCO
Frank SCHUH	DRILLING TECH. INC.
Earl SHANKS	MEPSI
Howard SHATTO	Consultant
Paul STANTON	EXXON.

TEDCOM replacements:

John COMBES (for Phillip NICHOLLS)	CHEVRON
Junzo KAZAHARA (for Hiromi FUJIMOTO)	UNIV. TOKYO
Alister SKINNER (for David GRASSICK)	BGS
Michel TEXIER (for J. BONASSE-GAHOT)	ELF.

TEDCOM liaisons:

Barry HARDING	TAMU
James NATLAND (for G. BRASS)	PCOM
Paul WORTHINGTON	DMP.

Permanent observer:

Mark WALTZ (for Duke ZINKGRAF)	UNDERSEAS DRILLING INC.

Thematic Panelists:

(James NATLAND	for LITHP)
William NORMARK	SGPP
Dale SAWYER	TECP
Dorrik STOW	SGPP.

Guests:

Michael KEARNS	WESTECH GEAR CORP.
Chuck McKINNON	" " "
Robert PETERSEN	LONGYEAR
Jack POWERS	Consultant
D. WESTER	LONGYEAR
Allen ZUMBRUNNEN	"

TAMU staff:

Leon HOLLOWAY
Steve HOWARD
Mike STORMS.

Absents:

Henrich RISCHMULLER	KTB
Harald STRAND	NORSK HYDRO
Walter SVENDSEN	Consultant.

AGENDA

February 14 8.20 AM - 5.30 PM

1. Introduction
2. Legs 126-129. Operations summary
3. Engineering Projects. Status Report
4. SGPP requirements relating to sand coring
5. DCS Phase 2 - 4,500 m design
   - Leg 132 planning
6. DCS concept discussion
7. Very deep drilling. ODP objectives
8. Long term planning of technological developments
9. High temp. slimhole logging update
10. Engineering Leg 3.

February 15 9.00 AM - 1.00 PM

1. Visit to DRECO INC. in Clearfield, Utah
   to inspect ODP's DCS.

1. INTRODUCTION

Charles SPARKS welcomed participants to the eighth TEDCOM meeting and in particular Earl SHANKS and Howard SHATTO whose membership of the TEDCOM had recently been approved by PCOM. These new members took the place of Martin CHENEVERT and Archie McLERRAN who had rolled off the committee. A further member with knowledge of high temperature drilling is being sought.

C. SPARKS mentioned that the subcommittee formed at the previous meeting had met once, with many additional participants, in Houston on December 4th 1989 to review the development of the 4,500 m DCS.

The agenda was presented and it was pointed out that the principal tasks of the meeting were:

- to review the development of the DCS which would be redeployed on Leg 132 (June-August 1990)

- to discuss very deep drilling with representatives of the thematic panels.

2. LEGS 126-129. OPERATIONS SUMMARY

Barry HARDING spoke about the drilling problems that had been encountered on the four legs that had taken place between April 1989 and January 1990. They had been dominated by stuck pipe and fatigue failures, which had led to the loss of an exceptional quantity of drillpipe and BHAs.

At the first site on Leg 126, 17 joints of drillpipe and a RCB BHA were lost because of backflow of volcanic sand. A further 64 joints of 5" pipe plus 2 stands of 5½" pipe, drilling jars and the BHA were lost at the third site, when the pipe became stuck above the jars and had to be severed. This occurred after the first good field test of the hydroflex drilling jars.

At site 793 B (Leg 126), in 2,975 m of water, 46 joints of 11 3/4" casing were set and the RCB was used to core to 1,682 mbsf, which is a new penetration record for ODP. Recovery was 65 %.

Legs 127 and 128 in the Japan sea were also fraught with incidents. The coring winch line was successfully speared and retrieved following a line failure which led to 1,400 m of wire falling down the pipe. At site 795 B, 131 joints of drillpipe were lost, when the vessel lurched during the lowering of the 71 st stand. This was the result of an apparent fatigue failure in the top pin of one of the 5" drillpipe joints.

A further fatigue failure occurred at mid-body in a joint of 5" drillpipe 400 m above the bit. No 'necking' was noticeable at either of the fatigue failures.

B. HARDING suggested that the ideal would be to scan all joints of drillpipe and then record the usage of each one. Pipes are inspected and downgraded regularly, but to date no pipe has been downgraded due to finding a fatigue crack (only for area loss or pitting). It appears that the present method of inspection (NDT) does not always identify small cracks which then grow and cause failure before the next scheduled inspection.

Leg 129 started with 10,000 ft of new 5" drillpipe. The first site was drilled and cored to 544 mbsf in 5 697 m of water, an ODP record. Jurassic sediment and rock were recovered. While running 480 m of 11 3/4" casing ship rolls of 7° led to failure of the TV coaxial cable and loss of the VIT frame, which was never recovered.

3. ENGINEERING PROJECTS. STATUS REPORT

Mike STORMS gave the status report on engineering projects other than the DCS.

The "Motor Driven Core Barrel" (MDCB), which was previously known as the Navidrill or NCB, was being improved. The goals of the 3rd generation

tool were to eliminate stalling and lunging at the start of coring, and also to obtain positive indication of penetration after each run. The idea of using a sand line to control WOB (see previous TEDCOM) was impractical because of line stretch and the absense of a sand line compensator.

A new side entry sub was being developed with Stress Engineering and should be ready for Leg 133.

The Advanced Piston Corer (APC) was having its piston rods and connections strengthened to move the weak point to the core barrel connection and hence minimise hardware losses.

The Pressure Core Samples (PCS) was being modified for Leg 131 (Nankai, April-May 1990). An additional sampling port had been added to allow the original fluid trapped with the sample to be replaced by high pressure gas or another fluid. A "harpoon" had also been added, to pierce the sample and allow gas and fluid within the core sample to be extracted. These changes had been made at the demand of SGPP which is coordinating science guidance on the design of this tool. A lab. chamber is to be developed for installation on the ship.

A Vibra Percussive Corer (VPC) is being developed for wireline deployment with the APC, to which it will impart a high frequency vibration and increase penetration. It will be tested on Leg 134. The frequency will be in the range 20-50 cps. Frank SCHUH pointed out that the frequency should be related to the particle size, since the object is to liquify the soil.

TAMU engineers are continuing to reflect on high temperature drilling and coring and have attended several meetings with recognised experts in this area in the last few months. There are tentative plans for deploying a high temperature DCS on the third engineering leg in late 1991. The present technology should be able to withstand temperatures upto 250-350°C with small improvements. This is greater than the temperatures geothermal engineers have encountered on land (less than 250°C). Bill NORMARK indicated that fluids can vent at the seabed at 400°C and temperatures in magma chambers are far greater than that.

4. SGPP REQUIREMENTS WITH RESPECT TO SAND DRILLING

Dorrik STOW explained that one of the principal objectives of SGPP (Sedimentary and Geochemical Processes Panel) was to recover cohesionless materials such as silts and sands. These materials are widespread and diverse and much information is lost if they are not recovered. Several legs already planned (Nankai, Leg 131; NE Australia Margin, Leg 133; sedimented ridge crests, Leg 137) and future legs under consideration will all require drilling and coring through sands. The sands need to be recovered without significant disturbance. Their recovery is important for the study of fluid movement, sedimentological problems and sealevel fluctuation. On certain legs SGPP would recommend one round trip per core, if necessary to achieve undisturbed recovery.

Barry HARDING mentioned that difficulty is caused by sand pockets which are washed out by the circulation. Keith MILLHEIM added that AMOCO have cored sands successfully with mining systems and they are about to try recovering soft shales. A low flow return circulation system is required. Alister SKINNER said there is no problem in recovering sand cores if a split or plastic liner is used. Mike STORMS added that hole stability is the main problem in sands.

5. DCS PHASE 2 - 4 500 M SYSTEM. ENGINEERING LEG 2

Steve HOWARD explained some of the modifications that are being made to the DCS. The secondary heave compensator will be able to respond to a heave of +/- 12 in at periods down to 6 seconds. The new electric top drive will be able to apply a torque of upto 12,000 ft-lbs and run at upto 540 rpm. The mast system has be strengthened to take the reactive torque that results. The control system has been modified so that the secondary heave compensator can work to a predetermined WOB or a specified penetration rate.

Leon HOLLOWAY presented the seafloor systems of the DCS, to be used with the hard rock guide base at Leg 132 sites Bonin Backare (M.I.T. Guyot and with a jet in base at Shatsky Rise (see Appendix). Howard SHATTO was

concerned that the guide cone would not remain vertical, particularly if struck by the BHA during reentry. Syntactic foam on the cone is designed to keep it vertical, even if the HRB is not itself horizontal.

Charles SPARKS was surprised that a tapered stress joint was necessary above the base and was concerned that this would throw larger moments into the tube below the gimbal, than would otherwise be the case (point raised at the December subcommittee meeting). L. HOLLOWAY explained that the design of the stress joint had been slimmed slightly, following the December meeting, but was still necessary, to carry the horizontal shear loads.

Concern was expressed about the possibility of vibration at Shatsky Rise (2 625 m water depth) induced by rotation of the DCS. Keith MILLHEIM suggested polymer should be available to be added to the annulus if necessary to eliminate or reduce this problem. Chuck McKINNON added that he had developed a model, to analyse transverse vibrations, which could be run on the ship.

The second engineering leg (Leg 132) during which the DCS would be deployed in three different regions was scheduled to leave from Pusan, Korea on June 7th and terminate in Guam on August 5th. The objective with the DCS was to core to about 150 m below the API bit at each location.

6. DCS CONCEPT DISCUSSION

Mike STORMS explained that the objective in a future DCS would be to suspend the API string from the ship using tensioners and to hang only the DCS from the compensator. The main compensator would be tied electronically to the position of the top of the API string. A secondary heave compensator would be hung from the main one, to compensate for fluctuating WOB of the DCS, as with the present DCS platform. The advantages of such a future system would be several. The men would work on the rig floor; longer joints of DCS pipe could be handled; standard equipment such as ship winches could be used. The time scale for this development would be several years. A detailed feasability study would first be required.

Howard SHATTO thought it would be a much safer system, since the men would be on the rig floor. He was concerned about the danger, with the present system, of large vertical accelerations being transmitted to the platform if ever there were a failure of the API string under tension. SHELL had had such an experience in 1983/84 when the riser head recoiled through the drill-floor, following an accidental disconnection. Steve HOWARD said the effect of API string failure had been studied and accelerations were calculated to be acceptable.

7. VERY DEEP DRILLING. ODP OBJECTIVES

Charles SPARKS introduced the subject by requoting extracts of the TEDCOM response to the long range plan (see last meeting), which expressed considerable reserve about the realism of ODP's very deep drilling objectives and particularly the aim to reach the MOHO in the near future. It was PCOM's surprise at the position taken by the TEDCOM that led to representatives of thematic panels being invited to the present TEDCOM meeting.

Lithosphere Panel

Jim NATLAND presented the objectives of the LITH panel, which had been defined in 1988 at COSOD II, namely full crustal penetration extending 1 km into the mantel, by the year 2000. This would require 6 km total penetration below 4.5 km of water. He explained that samples of the mantel could be taken more easily by 'offset drilling' in regions where the mantel had been thrust upwards, close to the seabed, but this was of very much less interest for LITHP. The latter had estimated that the 6 km penetration hole would require 18 legs (3 years) to drill and the principal technical requirements were a longer drill string, and stronger reentry cones and casings.

The TEDCOM reaction was firstly that it did not wish to modify the reserve expressed in its response to the LRP. Nobody has every drilled to such depths in crystaline rocks apart from the Russians who took 15 years or more to do so, at astronomical cost. Frank SCHUH suggested that different scenarios should be costed out which might lead LITHP to

modify their objectives. Before attempting such an exercise, contact should be made with the Russians to assess the difficulties they had encountered. Keith MILLHEIM added that a different drilling platform, such as a semi-submersible would probably be required to meet such an objective. Some of the problems encountered at great depth are related to high lateral stresses in the well walls, exploding cores, splitting of walls, gigantic weights of casing, and drilling an ultra straight hole. The TEDCOM favoured forming a task force composed of members of TEDCOM, TAMU and LITHP to discuss how to proceed.

Tectonics Panel

Dale SAWYER presented TECP's technical requirements. These included:

- riser drilling to give increased hole stability and to allow deep penetration
- recovery of undisturbed orientated core
- packers to allow insitu pressure measurements, flow testing, fluid sampling
- instrumentation to measure temperature, fluid flow, seismicity
- insitu stress/strain measurement.

TECP is particularly worried about planning legs for which tools do not exist or are only under development. PCOM cannot make the scheduling of particular legs conditional on the development of tools.

TECP's deep drilling objectives do not exceed 3 km.

Sedimentary and Geotechnical Processes Panel

Bill NORMARK said that SGPP was a new panel and their principal priority was the recovery of undisturbed samples of sediments and

particularly sands (see Section 4). They have no great interest in very deep holes (>1 km). Both halves of the panel (S and G) agree that the drilling of acretionary prisms is a high priority. Measurement of flow in the formation is particularly important.

8. LONG TERM PLANNING OF TECHNOLOGICAL DEVELOPMENTS

Charles SPARKS explained that this point had been added to the agenda at the request of PCOM, since they thought that innovations like the DCS might have been developed sooner, if a group were set up to logically plan such developments.

The TEDCOM considered that the best forum for discussing new developments was the TEDCOM, with the participation of representatives of the scientific panels.

9. HIGH TEMPERATURE SLIMHOLE LOGGING UPDATE

Paul WORTHINGTON (DMP) reported that commercially available tools and associated wireline cable are not viable upto the temperatures encountered at EPR and sedimented ridges (350°C). Several options can be used however to try and extend the range. These include cooling the hole, adopting a throw away policy an thermally damaged cable, or using simple analogue tools or memory tools without cables.

In the short term (1-2 years) LITHP objectives are being addressed. These include tools to measure temp./pressure to 400°C, formation and fluid resistivity and a high temperature fluid sampler. In the long term (5-10 years) a wide range of memory tools, rated in excess of 350°C, will be required.

Hole diameter constraints on logging will not become clear until the DCS is fully proven and the reaming option has been evaluated. Attainment of a comprehensive high temperature logging capacity depends on the availability of funds. An international task force is required to bring this to fruition in the long term.

10. ENGINEERING LEG 3

The third engineering leg is tentatively planned for Leg 136 in March 1991 on the East Pacific Rise (EPR). It may be a two phase operation with 2 x 30 day legs 6 months apart. The East Pacific Rise is a high temperature zone and will be difficult to core.

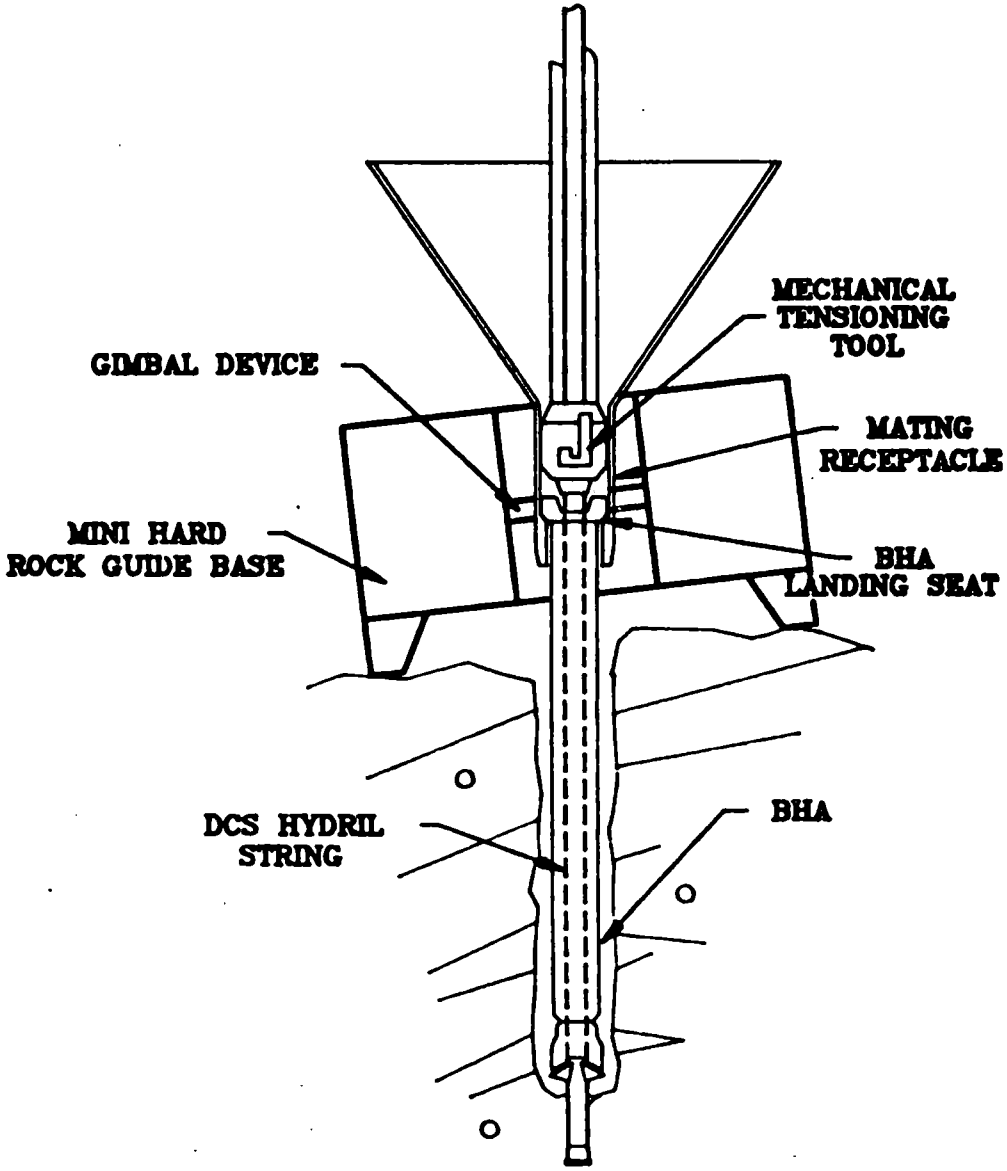
Two guide bases will most likely be set and deepening of these boreholes will then be carried out on future scientific legs. Other objectives for Engineering Leg 3 will be to test a "drill-in" BHA for drilling in young, fractured rocks, and a DCS system BOP for steam. Hole 504B will be cleaned up and high temperature tests carried out.

11. NEXT MEETINGS

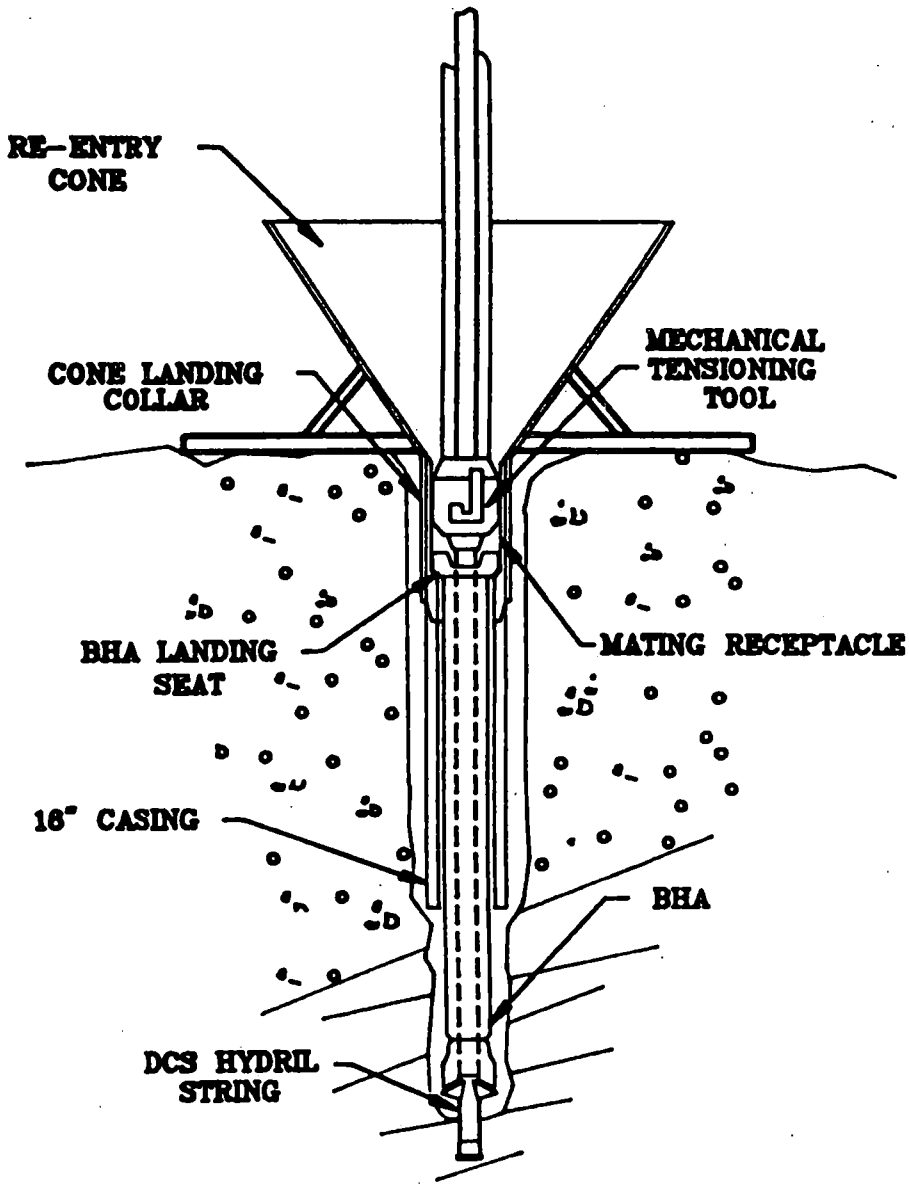
The following dates and places are proposed:

- Ninth TEDCOM Sept. 26-27 1990 College Station

- Tenth TEDCOM June 1991 San Diego
  during port call of JOIDES RESOLUTION.



HARD FORMATION CONCEPT



SOFT FORMATION CONCEPT

COMPARISON OF SEAFLOOR DEPLOYMENT SYSTEMS

United States Department of the Interior

GEOLOGICAL SURVEY
BOX 25046 M.S. 940
DENVER FEDERAL CENTER
DENVER, COLORADO 80225

IN REPLY REFER TO:

Office of Energy and Marine Geology
Branch of Petroleum Geology

TAKE PRIDE IN AMERICA

March 5, 1990

Memorandum

To: Ralph Moberly, Chairman, JOI-PCOM

From: Mahlon Ball, Chairman, JOI-PPSP

Subject: PPSP meeting of 2/27-28/90

This meeting was held at U.S. Geological Survey offices, 3475 Deer Creek Road, Menlo Park, California.

Attendance:

Yutako Aoki, JOI-PPSP
Mahlon Ball, JOI-PPSP
George Claypool, JOI-PPSP
Claude Delas, JOI-PPSP
Mimi Fortier, JOI-PPSP
Art Green, JOI-PPSP
Dietrich Horn, JOI-PPSP
Barry Katz, JOI-PPSP
David MacKenzie, JOI-PPSP
Benjamin Mascarin, JOI-PPSP
Ralph Moberly, PCOM Chrman., H.I.G.
Lou Garrison, ODP/TAMU
Henk Wories, ODP Safety Panel
Thomas Thompson, ODP Safety Panel
Carl Brenner, JOI Data Bank, LDGO
Glen Foss, ODP/TAMU
Marta von Breymann, ODP/TAMU
Michael Fisher, Co, Chief, Sci. Leg 134
Gary Greene, Co. Chief Sci., Leg 134
Peter Davies, Co. Chief Sci. Leg 133
Judith McKenzie, Co. Chief Sci., Leg 133
David Feary, Sci. Leg 133
Jean Pierx Crumiere, Sci. Leg 133
Steve Lewis, JOI-SSP Liaison
Keith Kvenvolden, guest

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

Lou Garrison reviewed drilling results for Legs 129 and 130.

Ralph Moberly reviewed the drilling program's long-range plans from the perspective of JOI-PCOM.

Marta von Breymann led a discussion of shows encountered during Sea of Japan drilling (legs 128 and 129). From this discussion it was apparent that an addendum to PPSP guidelines is needed. This addendum must expand on guidelines for monitoring gas shows. Specifically, 1) records of shows must be maintained, 2) total gas values must be normalized on the basis of sediment sample weight, 3) temperature data should be available for sites with potential for hydrocarbon hazard, 4) guidelines must be provided for use of Rock-Eval pyrolisis data, 5) suggestions for a quick extract of sediment to be run in a capillary column, particularly for samples with flourescent cuts, must be evaluated, and 6) a hydrocarbon geochemist should be a scientific party member for all legs where potential hydrocarbon hazards exist.

George Claypool led a discussion of gas hydrates. Claypool pointed out that although existence of a BSR is evidence for free gas beneath a clathrate base, pressure of this gas should not exceed hydrostatic as long as water is present to combine with gas to form more clathrate. Claypool added that the volume increase accompanying decomposition of a gas hydrate is a function of hydrostatic pressure and that in oceanic settings with pressures of 300-600 atmospheres the volume increase is only 1.4 to 1.1 the original hydrate volume. Claypool feels that as long as a liquid water phase is present and the drill string is filled with a material having a density of at least seawater, there should be no tendency for the gas phase to flow to the surface. Art Green raised a question regarding huge gas pressures developed below clathrates in Siberia. Claypool pointed out that in permafrost settings water in liquid phase must be absent to allow gas pressures to build. Ball appointed a subcommittee of Claypool, Berry Katz, and Keith Kvenvolden to develop expanded guidelines for monitoring gas shows and updating PPSP policy regarding gas hydrates. These expanded guidelines will be presented and discussed at PPSP's next meeting.

Michael Fisher presented regional considerations and scientific objectives for leg 134, Vanuatu. Gary Greene gave site-by-site descriptions for the safety review by PPSP and the ODP safety panel. Ball read parts of David Robert's letter pertinent to Vanuatu sites to safety panel members prior to the consideration of these sites by the panel members.

DEZ-1	Approved to a penetration of 300 m at the intersection of lines 15 and 17.
DEZ-2	Approved to a penetration of 800 m at the intersection of lines 104 and 1022.
DEZ-4	Approved to a penetration of 1000 m at S.P. 800 on line 107.
DEZ-5	Approved to a penetration of 750 m at the intersection of lines 100 and 106.
IAB-1	Approved to a penetration of 1000 m at the intersection of lines 19 and 1041.
IAB-2	Approved to a penetration of 1200 m at SP 975 on line 20. This site was moved to avoid faulting and should be drilled after IAB-1.

Peter Davies presented regional considerations and scientific objectives for leg 133, Northeast Australia. David Feary gave site-by-site descriptions for the safety review by PSP and the ODP safety panel. Robert's letter, as it pertains to Northeast Australian sites, was considered by panel members in connection with this safety review. Green led a discussion of the distribution of source rocks, reservoirs, migration routes and seals in marginal troughs similar to the Queenland and Townville Troughs. The point was made that little is known concerning these basins and careful hydrocarbon monitoring is in order for drilling the Northeast Australian sites.

NEA-1	Approved to a penetration of 400 m at CDP 6390 on line 75/043.
NEA-2	Approved to a penetration of 400 m at CDP 5430 on line 75/043.
NEA-3	Approved to a penetration of 400 m at CDP 10445 on line 75/043. This site was moved to avoid reflection complexities.
NEA-4	Approved to a penetration of 400 m at CDP 468 on line 75/045.
NEA-4A	Approved to a penetration of 400 m at CDP 1084 on line 75/045.
NEA-5	Approved to a penetration of 1100 m at CDP 5865 on line 75/041.
NEA-6	Approved to a penetration of 400 m at CDP 798 on line 75/039.
NEA-8	Approved to a penetration of 400 m at CDP 3062 on line 75/037. This site was moved to avoid an apparent high at total depth.
NEA-9A	Approved to a penetration of 500 m at CDP 3668 on line 75/059.
NEA-10A	Approved to a penetration of 500 m at CDP 4068 on line 75/057.
NEA-10A (alternate)	Approved to a penetration of 300 m at CDP 5802 on line 75/057.
NEA-11 (alternate)	Approved to a penetration of 700 m at CDP 1232 on line 75/030 with the stipulation that the upper pelagic section maintains its muddy character and lacks shows. If hard zones representing potential seals are encountered, drilling must be stopped above the underlying turbidite section.
NEA-13	Approved to a penetration of 250 m at CDP 311 on line 75/027.
NEA-14	Approved to a penetration of 400 m at CDP 6630 on line 75/027.

Lou Garrison discussed scientific objectives of leg 132, an engineering leg and described each site for the safety review.

ENG-5	Approved to a penetration of 250 m at the intersection of lines FM-3507-8 and 10KK84-G.
ENG-6	Approved to a penetration of 275 m at 1816Z, 16 June 1977, on line Kona Keoki. 77-03-17 leg 5.

ENG-6A	Approved to a penetration of 275 m at 1812Z, 16 June 1977, on line Kona Keoki. 77-03-17 leg 5.
ENG-7,7A and 7B	Approved to penetrations of approximately 150 m at 1052Z, 1055Z, and 1047Z, respectively on line Roundabout, leg 10, 18 Nov. 1988.

Ball announced that complete files concerning the Exmouth Plateau drilling would be sent to members of PPSP and ODP safety panels, Garrison and Moberly, and that the Exmouth drilling discussion will be completed at the next PPSP meeting. PPSP noted unanimously to ask Lou Garrison to join PPSP on his retirement from ODP. PPSP designated August 15-16, 1990 as the date for its next meeting.

Copy to: Dr. Peter J. Davies

JOIDES LITHOSPHERE PANEL:
MINUTES OF 5-7 MARCH, 1990 MEETING (NEW ORLEANS)
EXECUTIVE SUMMARY

3.0 PLANNING ACTIVITIES

3.1 Engineering Leg at 504B

LITHP favors the following strategy for Engineering 3A: 1) At the start, a 2-3 day logging program, including temperature, fluid sampling and permeability. 2) Milling and fishing to attempt to clear the junk. 3) If this attempt is successful, deepening 504B as much as possible in the remaining time. 4) If junk cannot be cleared, a full-logging program should be carried out, either on 3A or at a latter time. A decision to start a new hole close to 504B should be deferred until after Engineering 3A results are known.

3.2 Engineering at EPR (3B)

Sufficient time between Leg 132 and 3B should be given for any engineering development that may be needed. During 3B, as many holes as possible should be established ($\geq$50m), possibly using mini-guidebases and drill-in casing.

3.3 LITHP Prioritized Drilling Programs for 1991-1994

In order, the programs favored by LITHP are: 1) Hess deep, 2.5) EPR, 2.5) MARK area, 4) TAG area, 5) Sedimented Ridges II, 6&7) VEMA, 8) Hawaii Pilot hole, 9.5) Geochemical Reference Sites, 9.5) Deepening 801-C - Old Pacific, 11) Volcanic Rifted Margins, 12) Endeavour Ridge hydrothermal activity, 14) Loihi, 16) Axial Seamount, 17.5) Valu Fa, 17.5) 735-B (Indian Ocean), 19.5) Site 505 - Stress, 19.5) Lithosphere Characteristics (DMP Initiatives), 21) Oceanographer F.Z., 22) Mathematician Ridge, 23) Marquesas, 24.5) Chile Triple Junction, and 24.5) Cayman Trough.

4.0 JOINT LITHP-TECP MEETING

4.1 Very Deep Drilling

We recommend formation of a technical task force to examine long-term strategies for very deep drilling.

4.2 Working Group for Volcanic Rifted Margins (VRM)

We strongly urge that a working group be appointed by PCOM at its April meeting.

5.3 LITHP Suggestions to IHP

LITHP suggests that XRD data and data from TAMU downhole tools be added to the computerized data bank.

5.6 Next Meeting

11-13 October, 1990, Tokyo; T. Fujii host.

JOIDES LITHOSPHERE PANEL MINUTES
March 5-7, 1990 New Orleans

Attending:	R. Batiza	S. Humphris
	K. Becker	J. McClain
	T. Brocher	C. Mevel
	S. Cloetingh	J. Mutter
	J. Erzinger	J. Pierce
	J. Franklin	J. Phipps-Morgan
	T. Fujii	G. Smith
Liaisons and guests:	J. Natland (PCOM)	R. Moberly (PCOM Chair)
	R. Duncan (PCOM)	G. Waggoner (JOIDES Office)
	M. Goldhaber (SGPP)	S. Howard (TAMU)
	J. Allan (TAMU)	K. Millheim (Amoco Prod. Co.).
	R. Larson (URI; Leg 129 Co-chief)	
Regrets:	L. Cathles	

WELCOMING REMARKS: R. Batiza welcomed J. McLain and T. Brocher to LITHP and welcomed the panel and guests to New Orleans. The meeting got underway at 0830.

1.0 LIAISON REPORTS

1.1 R. Moberly (Chair, PCOM)

Ralph Moberly reviewed for LITHP the important upcoming needs for planning. At its April meeting (April 24-26, Paris) PCOM will decide on a general track of the drilling vessel through Spring 1994. To do this, PCOM needs from each thematic panel, a ranked list of its prioritized drilling programs (important scientific theme plus proposal which successfully addressed the theme in a particular area). Moberly provided suggestions and examples of how this ranking might be done and what the finished list should look like. Once the general track of the Resolution is set for 1991-1994, specific drilling legs will be scheduled by PCOM about one year in advance. This is done each year at the "Annual Meeting" of PCOM in November. Thus, thematic panels will, yearly, have the opportunity to revise and update their rankings. The LITHP ranking for 1990 (this meeting) should exclude programs that are already scheduled for drilling in 1991: Sedimented Ridges I, and deepening 504B. Those LITHP programs which were tentatively scheduled for 1992 at the November 1989 PCOM meeting, such as Sedimented Ridges II and East Pacific Rise (which would be substituted for 504B in the event that the engineering leg at 504 cannot clear the hole) will be included in the ranking.

1.2 PCOM (R. Duncan and J. Natland)

In the future, the LITHP liaison from PCOM will be J. Natland. LITHP wishes to thank R. Duncan for being our liaison for the last half year. At its November 27-30, 1989 meeting at Woods Hole, PCOM scheduled the following legs for drilling in calendar year 1991: Sedimented Ridges I, Eastern Equatorial Pacific Neogene transect, and Layer 2/3 transition at Site 504B. In the event that 504 cannot be deepened, East Pacific Rise I will be substituted. PCOM also tentatively scheduled (for calendar 1992): 2 legs of drilling at the Chile Triple Junction, East Pacific Rise I (if 504B is drilled in 1991), Cascadia Accretionary Prism I and Sedimented Ridges II. These tentatively scheduled programs will have to be reevaluated in the future. PCOM also

discussed official liaison activities with other major geoscience programs and initiatives such as RIDGE, Global Seismic Networks (FDSN), etc. EXCOM decided to proceed with establishing such liaisons with the condition that no PCOM or EXCOM members could act as liaisons to these other programs. Under the topic of new ODP partner nations, it was noted that the Soviet Union might join ODP soon. Additional possibilities include an IOC consortium and possibly a consortium of East Asian countries (Korea, Taiwan, PRC). These possibilities are viewed very favorably, as continued technological development in drilling and logging will require continued new resources.

The issue of logging in slim (4") and hot (>300°C) holes was discussed at PCOM. Since then, several meetings at TAMU have resulted in an effort to obtain existing high-temperature, slim hole tools from Sandia labs. These tools are expected to be available in time for the engineering leg (Leg 132). It is clear that development of appropriate tools for slim and/or hot holes is essential for future ODP drilling.

PCOM established general guidelines for Working Groups (WG) and Detailed Planning Groups (DPG). Essentially working groups are for concept development and establishing general drilling strategies, whereas DPG's are used for more detailed planning. PCOM approved a DPG for the East Pacific Rise, chaired by Earl Davis which will meet 5-7 April at the Pacific Geoscience Center. In addition PCOM approved a DPG for the Cascadia margin, chaired by Larry Cathles.

PCOM approved a new 30-month publication schedule for Leg Reports. LITHP presented its annual report at the November PCOM meeting (see attached). LITHP noted the importance of long-range planning for implementation of the ODP long-range plan. Such planning is needed for several long-term objectives including a total penetration of the ocean crust. LITHP also suggested a better disciplinary balance on PCOM and reaffirmed its commitment to four long-term objectives: 1) penetration of normal ocean crust into the mantle, 2) establishing seismic and ridge-crest observations, 3) investigating magmatic and hydrothermal processes of crustal accretion and 4) improved understanding of off-axis volcanisms.

PCOM discussed the upcoming engineering leg (Leg 132). During the leg, the diamond coring system will be tested at three different sites (rubbly, young basalt, reef carbonate and chalk-chert sequences). This test will allow a thorough evaluation of the performance of the DCS under a variety of conditions. Continued development may be needed prior to Leg 136 (engineering leg for 504B and EPR). PCOM has approved a retrospective/forward-looking meeting on Indian Ocean drilling. The purpose is to synthesize previous results with a look to future possibilities for drilling.

1.3 OHP

Guy Smith presented a brief report on the last OHP meeting (26-28 Oct. 1989) in Germany. OHP is extremely interested in high latitude drilling, which may provide opportunities for multi-objective sites with interest from other thematic panels.

1.4 SGPP

Marty Goldhaber presented a summary of the last SGPP meeting (14-16 January, 1990, Santa Cruz) at which the panel established its rankings for the April 1990 PCOM meeting. SGPP has five themes: Sea level, fluids and gases, metallogenesis, paleooceanography and sedimentary processes. Within these, the overall SGPP rankings are: 1) Cascadia margin, 2) Chile triple junction, 3) Atolls and guyots, 4) Sedimented Ridges II, 5) New Jersey margin, 6) Gas hydrates, 7) EPR, 8) Gulf of California, 9) New Zealand, 10) Barbados, 11) TAG, 12) Nankai II and 13) Valu Fa ridge. SGPP also has a possible interest in geochemical reference

holes and other topics of mutual interest with LITHP. In terms of technological development, SGPP is pushing for improved fluid sampling, the pressure core barrel and better drilling/recovery in unconsolidated sand.

1.5 DMP

Keir Becker, LITHP liaison to DMP, reported on the late January meeting of DMP at TAMU. Much of this meeting was devoted to the issue of high-temperature logging and drilling. ODP now has a contract with Sandia to provide temperature and fluid sampling tools. A workshop is planned before mid 1990, to look ahead to further tool development. DMP has suggested testing the option of reaming DCS holes, which would allow large diameter tools to be used in the hole. This is particularly important for use of the borehole televiewer and VSP experiments. A sub group of DMP has been formed to look at hot/slim hole questions. Development of plugs for the sedimented ridges and Cascadia programs is moving forward, but sensors are a problem the at moment.

DMP has proposed an initiative on Lithosphere Characterization which would feature logging and other experiments done across closely spaced (1-2 km) holes. One objective is to provide a larger scale context for interpreting logging measurements in individual holes. This initiative is of obvious interest to LITHP and Jim McLain expressed interest in providing representation to DMP on this topic. Upgrading of the Barnes-Uyeda tool for higher temperatures is being undertaken at TAMU.

1.6 TECP

Prior to this joint meeting with LITHP, TECP met in Hawaii in September, 1989. C. Mevel provided a summary of TECP's high-ranked CEPAC drilling programs. TECP rated the Chile Triple Junction, Cascadia, EPR and Sedimented Ridges as high priority CEPAC programs. TECP's high-priority themes are 1) Convergent margins (accretion and collision processes), 2) Intraplate deformation, 3) Divergent plate boundaries, 4) Passive and transform margins, 5) Plate kinematics and 6) Plate dynamics.

1.7 Other Matters of Interest

J. Natland gave a brief review of the Lake Arrowhead Geochemistry meeting, which included sessions on alteration of the crust and metallogenesis. This conference endorsed the importance of drilling geochemical reference sites and global geochemical cycles. Seird Cloetingh attended the Nereis meeting in Brussels at the end of January and provided a brief report. Nereis is the name of a new planned platform which could be used for shallow drilling aimed at global problems such as climate change. This multifaceted proposed "program" is based primarily on great interest in Europe, however it is planned as a fully international program. The Nereis program appears to be a fine idea, however several international members of LITHP voiced the opinion that their countries could probably not afford funds for both ODP participation as well as involvement with Nereis.

2.0 PROPOSAL REVIEWS

2.1 286/E Addendum - Engineering Options at 504B and More (K. Becker)

The option of milling the junk from the bottom of 504B still appears to be promising. Another possibility is to start a new hole nearby. This possibility has many engineering advantages, however a decision to drill without coring must be made with due regard for the time scales of crustal heterogeneity and other matters. For example, in view of the DMP

Lithosphere Characterization Initiative, a distance of 1 to 2 km would seem an optimal separation between 504B and a possible new hole. However this distance is just large enough that correlations within the volcanic section (without coring) could be difficult. Clearly the issue of starting a new hole very near (100-500 m) 504B is one which should be fully aired and is of great interest to LITHP. Probably a new proposal is needed, however, as the issue of a new, un-cored hole raises important scientific as well as engineering questions. The issue of the engineering leg for hole 504B is taken up separately elsewhere in these minutes (section 3.1).

2.2 325/E - High-Temperature Hydrothermal Site - Endeavour Ridge (H. P. Johnson et al.)

This proposal was previously reviewed by the Sedimented Ridges DPG, however LITHP undertook to review it within the Lithosphere Panel as well. This proposal addresses: 1) the composition of hydrothermal deposits and their precipitation mechanisms, 2) the nature of discharge and local advective (fluid pathways) processes and 3) extent and compositional variations in the conduit. The proposal has the following very attractive features: 1) The Endeavour deposits are large deposits precipitated at an unsedimented ridge crest. 2) The natural laboratory aspect of starting a smoker (by drilling) and then studying the evolution of discharge and precipitation. 3) The planned experiments could be very useful in elucidating the permeability structure of the upper crust. For these scientific objectives, Endeavour is a better site than the East Pacific Rise. As at other unsedimented ridges, the drilling would require the use of a hard rock guide base. Some deficiencies of the proposal are that it has no magmatic objectives. For example, are the location of hydrothermal discharge sites related to the chemistry of volcanic rocks in the area (vis a vis fractionation and magma chamber processes)? Also, the planned program would provide few constraints on the flow regime in three dimensions. On balance, this proposal was highly rated, as reflected in the rankings of drilling programs for 1991-1994.

2.3 351/C - Bransfield Straight (B. C. Storey et al.)

This proposal is clearly very preliminary. Our copy contained no site forms and had no reference list. Much site survey data and additional documentation is clearly needed (e.g. data on sediments). Of particular importance is heat flow data to document possible sites of hydrothermal activity. Even so, the back-arc basin setting is very interesting and somewhat analogous to the Okinawa trough. The evolution of petrogenesis from calc-alkaline rocks to those of the Antarctic peninsula is of particular interest to LITHP. Given the possible importance of changes in sea level and the thick sediments, several of the sites should also be of interest to OHP. The thick sediments might pose a safety problem, and clearly more site-survey work is justified. LITHP supports continued work in the area and would be glad to see a revised, more mature proposal in the future.

2.4 352/E - Layer 3 at the Mathematician Ridge (D. Stakes and D. Vanko)

The objectives of this proposal are important priorities of LITHP. However the proposal is presently immature. In order to achieve its objectives and to locate sites, seabeam and perhaps submersible work will be needed. The Mathematician Ridge is a very promising site for drilling fast-spread layer 3 gabbros. LITHP would like to see a more mature proposal after additional site surveys are completed.

2.5 358/A - Volcanic Rifted Margins - Voring Margin (O. Eldholm et al.)

In contrast with several other proposals on the same subject that LITHP has previously reviewed, this proposal makes good use of previous drill results and would build on these results. However, the proposed transect is not really a continuous one and the proposal has no firm magmatic objectives (which would make it much more attractive to LITHP). LITHP

believes that the whole question of volcanic rifted margins must be put into a global context. It would then be possible to more clearly define the problems that can be solved and to set out a strategy and criteria for deciding the best areas. Elsewhere in these minutes we request that PCOM approve a Working Group for Volcanic Rifted Margins to do this. Overall this general problem of volcanic rifted margins is of great interest to LITHP. However this proposal, like others, is deficient in addressing the magmatic questions associated with the general phenomena.

2.6 359/A - North Atlantic Conjugate Margin Drilling - Letter of Intent

The early rift history of continents, documented on passive margins, is of interest to LITHP. 359/A is, however, only a letter of intent. 365/A, a more mature version of this letter of intent, was separately reviewed.

2.7 360/D - Hydrothermal Activity and Metallogenesis at Valu Fa Ridge (U. von Stachelberg et al.)

Although this is a preliminary proposal which lacks much detail, the area is of great interest as are the scientific questions addressed. Valu Fa is interesting because of its high SiO_2 rocks, shallow depth (possibility of boiling) and because the setting is appropriate for many of the large sulfide deposits in the geologic record. Further, Valu Fa has a well-documented magma chamber. However the hydrothermal deposits and the area are not as well documented as might be wished. In addition, the specific problems to be addressed and reasons why Valu Fa is the best place to address them are not given. Even though the proposal is rather preliminary, LITHP recommends that the Lau Basin Working Group strongly consider having the site as an alternative site during Leg 135. Particularly if the DCS is aboard, drilling the Valu Fa deposits would potentially be very rewarding.

2.8 361A - Active Hydrothermal System in the TAG Area (Thompson et al).

This is a very good proposal which addresses high priority objectives of LITHP. The proposed work has good potential for definitive studies of the stock work, alteration zone (flow regime; past history) but the high-temperature reaction zone may be difficult to reach. The TAG area may be the best site available for such a study of deep-water activity (no boiling). The intermittent activity at TAG is a mixed blessing since correlations from place to place in the deposit may be difficult. Some deficiencies in the proposal itself are that: 1) relation of hydrothermal activity to petrology/magmatic processes is not well covered, 2) more detailed information needed for specific site selection should be presented. Overall, this proposal is highly ranked as reflected by the proposal rankings.

2.9 362/E Rev. - Chile Triple Junction (S. Cande et al.)

As before, the proposal remains of interest to LITHP. Of particular interest are the hydrothermal objectives and deepening TJ-7 at least 50 m into basement. As before, LITHP notes that a great deal of documentation for particular drilling objective and sites is still lacking, however the setting and potential of this program are both extremely interesting.

2.10 363/A - Plume Volcanism: Grand Banks-Iberia Separation (B. Tucholke et al.)

This program is a subset of a larger program for drilling the rifted margins of the North Atlantic. As such, LITHP feels that the Volcanic Rifted Margins (VRM) Working Group would want to include some discussion of the possible role of early plume volcanism. As a general topic this issue is of great potential interest to LITHP. Drilling probably could succeed in testing the plume hypothesis for the seamounts in question. However LITHP asks whether such a test would be of broader interest than just locally? It is for this reason that a broader context

for plume volcanism in the rifting history of VRM is important. Overall, LITHP ranks this proposal rather highly, but still recommends that it be considered by a DPG at a latter time, when an integrated program of VRM drilling is being put together.

2.11 365/A - Conjugate Margins - North Atlantic (J. Austin et al.)

This proposal addresses the early rift history of a non-volcanic rifted margin. It is of interest to lithosphere in its own right, but also a potential endmember of volcanic/non-volcanic rifted margins. Overall, the proposal is excellent and consistent with the strategy advocated by COSOD II. The need for two transects is not well defended, however except for this, the proposal is well-documented and obviously quite mature. LITHP notes that the program is very ambitious and many holes are extremely deep (probably will require a riser). Probably in the future, a DPG should be formed to determine how a program like this could be pared down to its essentials.

2.12 366/A - Laborador-Greenland (M. Salisbury)

This is a letter of intent only. It will be reviewed when a proposal is received.

2.13 368/E - Return to 801-C - Jurassic Pacific Crust (R. Larson et al.)

Deepening 801-C is of great interest to LITHP, as it addresses the high priority of characterizing old fast-spread ocean crust and its hydrothermal/alteration history. More information is needed on the nature of alteration and hydrothermal products. The deep reflectors are of interest, particularly to discover whether they represent alteration fronts or the layer 2/3 boundary. If 801-C is deepened, it is important that a full logging program be carried out. Overall, LITHP ranks the proposal highly, as reflected in the program rankings.

2.14 369/A - Deep Mantle Section in the MARK Area (C. Mevel and M. Cannat)

This is an excellent proposal addressing very highly ranked scientific questions of LITHP. The advantage of drilling a deep mantle section in the MARK area, is that it is away from severe transform activity. While there is excellent evidence for peridotite, it is not clear how deep it goes. A deep hole would be most interesting to sample the full variability of shallow mantle. At the same time, a number of shallow holes would complement the deep hole. A disadvantage of the MARK area is that the deep mantle hole could not be used with offset section to determine the relationship to gabbros and volcanics. Also, the nature of the peridotite contacts is not well known. Overall, however, LITHP ranks this proposal very highly, as reflected in its rankings of drilling programs.

2.15 370/A - Magmatic Processes and Natural Tracers - Deep Crustal Drilling (H. Dick and P. Robinson)

While this program proposes deep drilling into layer 3 rocks, of great interest to LITHP, the scientific rationale and hypotheses to be examined are not clearly presented. Understanding magma chamber processes is extremely important, however it is not clear exactly how this proposed drilling would get at this question. The comparison of Oceanographer and SWIR is also difficult to understand, because the documentation for coeval volcanic rocks at Oceanographer is scanty. LITHP feels that this proposal is potentially of interest, and would welcome a more mature proposal clarifying the scientific rationale for drilling.

2.16 371/E - Nova Canton Trough (B. Rosendahl et al.)

This letter of intent is of great interest to LITHP because the area offers promise for off-set drilling of an intact portion of normal Pacific crust. LITHP welcomes a mature, more detailed drilling proposal.

2.17 373/E - State of Stresses, Hydrothermal Circulation and Heat Flow, Site 505 (M. Zoback et al.)

Assessing the state of stress in very young crust is an important objective. This proposed site, if drilled could tell much about the interplay of thermoelastic stresses and regional stresss. Furthermore, Site 505 could potentially tell a great deal about hydrothermal processes, by comparison with Site 504B. One problem is that hole 505 was a very difficult hole and it may be impossible to deepen unless the DCS is used. Another complication is the rough-smooth progression of ridge topography, which could indicate complex ridge processes. In such a case, the stress regime could be quite complex and difficult to interpret. Is Site 505 the best place to do such an experiment? Overall, the proposal was moderately well ranked in LITHP's ranking of drilling programs.

2.18 374/A - Oceanographer Fracture Zone - Mantle Heterogeneity Deep Hole (H. Dick and J. Quick)

This proposal addresses several high-priority objectives of LITHP. The proposal is attractive because it addresses the issue of the scale of mantle heterogeneity, the region is near a hot spot (more melting) but also near a fracture zone (less melting?). Alteration of the peridotite and its history of emplacement are also of interest. At Oceanographer, all crustal components are present and exposed, so an off-set drilling strategy could be successful. LITHP thus wonders why drilling the crust-mantle boundary was not also proposed. LITHP also questioned putting the mantle and layer 3 holes on opposite sides of the transform. Overall, this proposal has many features of great interest to LITHP, which would welcome a more mature proposal.

2.19 375-D - Layer 2/3 Boundary and Long Section of Layer 3 at Hess Deep (H. Dick et al.)

This is an excellent proposal addressing several very highly-ranked thematic priorities of LITHP. The area appears very promising, though additional site survey data and documentation are needed. Sites HD-1 and HD-2 are of great interest to LITHP; of less interest is HD-3. LITHP notes that the program is very ambitious and could take two legs of drilling or more (HD-1 and 2). Overall, LITHP very enthusiastically endorses the program.

2.20 376/A Layer 2/3 and 3/Mantle Boundary at Vema (J.-M. Auzende et al.)

This is an excellent proposal which addresses very highly ranked thematic priorities of LITHP. At Vema, it would be possible to use an off-set drilling strategy to recover rocks from the layer 2/3 boundary and the layer 3/mantle boundary (Moho). Though the proposal is preliminary in nature, the area and promise are exciting. LITHP notes that the hydrothermal objectives probably do not require drilling. LITHP would welcome a more specific proposal with better documentation. However, even on the basis of this preliminary proposal, LITHP ranks the Vema program very highly.

2.21 280A Rev. - VICAP - Revised

This revised proposal has many of the strengths and weaknesses of the original. For example, is the Canaries the best place to carry out the study: an inland far from the continent may be a better choice. Despite the argument that the aprons are a closed system, is it not possible that inputs from other islands are received? What about the role of possible large slumps? Such slumps are well-documented on other islands and could complicate interpretations. Some evidence for these slumps appears in the seismic data. The Lithosphere loading question is very interesting, but for this deeper seismic data are needed. More site surveys are needed, and might be more useful in the northern part of the area. While this proposal does not address any of LITHP's highly-ranked thematic objectives (e.g. LITHP White Paper), it is still of moderate interest for eventual drilling.

3.0 SHORT-TERM AND LONG-TERM PLANNING

3.1 Engineering Leg 3A at Site 504B

At its April meeting, PCOM firmly scheduled Engineering 3A and 3B (Leg 136) for 504B and the EPR respectively. After this, Leg 137 is Sedimented Ridges I, Leg 138 is East Pacific Neogene transect and Leg 139 is either to continue deepening of 504B or EPR-1, depending on whether 504B can be cleared of junk.

The question of whether Engineering 3A and 3B need be contiguous has recently arisen. Before addressing this, we first turn to the question of what LITHP views as the important missions of each engineering half-leg. Leg 3A at 504B is presently scheduled for 37-38 days. With transit time (~17 days), there is really only sufficient time for milling junk (and/or fishing, as required) and a modest program of downhole measurements. LITHP feels it is important to complete 2-3 days of downhole logs (temperature, fluid sampling and permeability) prior to milling. The remaining time, LITHP feels, should be devoted to milling the junk and if the hole is cleared with time still remaining, an effort should be made to drill ahead. It is for this reason that at least a small scientific party be present on Engineering 3A.

If milling and fishing operations are unable to clear the hole after 19 or so days, than an evaluation for a best course of action can be made later. If it is clear very early in the leg that 504 cannot be cleared (for whatever reason), LITHP recommends that the remaining time of Engineering 3A be used to carry out a full logging program of: FMS, wire-line packer, flow meter, geochemical logging and sidewall coring. Alteratively, if the hole can be cleared, then this logging program (1 week or so) could be carried out at the beginning of Leg 139. If 504B cannot be deepened during Engineering 3A, an attractive possibility may be to drill a new hole nearby without coring. Assessing this option from a scientific point of view, however, would require a new proposal and considerable discussion of alternative sites for a deep hole. In any case, this decision can be made after Engineering 3A is complete.

3.2 Engineering 3B at the EPR

Engineering half-leg 5B need not follow immediately after 5A, however LITHP feels that it should be scheduled as soon as possible, consistent with engineering needs for possible additional development after Leg 132. From previous discussion with the TAMU engineering group, LITHP views the purpose of Engineering Leg 3B as being much more important than simply deploying two or more old-style large guidebases. Instead, the purpose of the engineering half-leg is to fully establish one or more drill sites at the EPR. Several possible options for doing this have been discussed, and one attractive possibility is to use pogo mini-guidebases and drill-in casing. With this technique, established holes ($\geq$ 50 m deep) could be

sealed and be ready for further deepening during later drilling. If these new techniques are unsuccessful, Engineering 3B could be used to try an array of others. In either case, one or more EPR sites could be established and perhaps significant penetration could occur during Engineering 3B. In this case also, it would be useful to have a small scientific party aboard to handle the samples and to help make scientific decisions during the leg.

3.3 Long-Term Planning: General Track of the Vessel 1992-1994

Since 504B, Sedimented Ridge I and Engineering 3A and 3B are scheduled, we did not consider these in our ranking of drilling programs. In this ranking, LITHP did consider all themes and other proposals reviewed to date. Our ranking is as follows:

LITHOSPHERE PANEL RANKED DRILLING PROGRAMS - 3/90

Rank	Theme	Proposal	Area	# of votes
1	Layer 2/3 transition and long section of layer 3	375/D	Hess Deep (central Pacific)	255
2.5	Magmatic and hydrothermal processes at fast-spreading ridges	321/E, 357/E	East Pacific Rise	133
2.5	Long section of upper mantle	369/A	MARK area of the Mid-Atlantic Ridge (26°N)	133
4	Hydrothermal processes and metallogenesis at slow spreading ridges	361/A	TAG area of the Mid-Atlantic Ridge (26°N)	115
5	Magmatic and hydrothermal processes at sedimented ridges	SRDPG drilling prospectus	Middle Valley and Escanaba trough (NE Pacific)	106
6	Layer 3 - mantle transition	376/A	Vema Fracture Zone	93
7	Layer 2/3 transition	376/A	Vema Fracture Zone	92
8	Global Seismic Network Pilot hole	315/E (377/E)* *not reviewed	N.E. of Oahu, Hawaii	88
9.5	Element fluxes and mass at subduction zones	267/F	West Pacific off Mariana and Bonin arcs	49
9.5	Characteristics of old, spreading ocean crust	368/E	Site 801-C	49
11	Early history of continental rifting	Various: drilling program to be designed by future proposed) WG	North Atlantic margins	46

12	Hydrothermal and metallogenic processes at medium spreading ridges	325/E	Endeavour Ridge (N.E. Pacific)	41
13	Long section of layer 3	376/A	Vema Fracture Zone	38
14	Early hot-spot evolution	252/E	Loihi Seamount	37
15	Origin of large metal sulfide deposits	325/E	Endeavour Ridge	23
16	Evolution of near-axis seamounts	290/E	Axial Seamount	21
17.5	Hydrothermal processes in back-arc basins	360/D	Valu Fa Ridge-Lau Basin	20
17.5	Layer 3 - mantle transition	300B	Site 735-B, A-II Fracture Zone, Indian Ocean	20
19.5	State of stress in the lithosphere	373/E	Site 505, Costa Rica Rift	18
19.5	Lithosphere characteristics	DMP initiative	Specific sites not yet chosen	18
21	Long section of upper mantle	374/A	Oceanographer Fracture Zone	17
22	Extinct ridges	352/E	Mathematician Ridge	16
23	Temporal evolution of hot spots	291/E	Marquesas	12
24.5	Ridge collision processes	362/E Rev.	Chile Triple Junction	11
24.5	Transform dominated ridges	333/A	Cayman Trough	11

Explanations, qualifying statements and caveats for each program follows:

Hess Deep: Hess Deep is not fully mature yet, however it should be (soon after Spring 1990) when additional ALVIN dives are completed. Detailed site selection could occur anytime after that. Two important LITHP themes can be successfully approached in this area: the layer 2/3 transition and a long section of layer 3. It may even be possible to drill to the layer 3/mantle boundary, but this is not yet well-documented. This program could be successfully completed with conventional RCB drilling and bare-rock guidebases.

EPR: The EPRDPG meets in April 5-7, 1990 to construct a specific drilling program at the EPR, 9°30'N and/or 12°50'N. Clearly, success of this program depends on successful tests and development of the DCS. Drilling at the EPR will elucidate magmatic and hydrothermal processes at fast-spreading ridges.

MARK areas: The MARK area south of the Kane F.Z. is ideal for drilling a long section of the oceanic upper mantle away from a transform. This program could be carried out with conventional RCB drilling plus bare-rock guidebase and the proposal is mature.

TAG area: The important theme of hydrothermal and metallogenic processes at slow-spreading rates can be successfully addressed at the TAG hydrothermal area with its very large massive sulfide deposits. This program will be fully mature as soon as data from the last cruises is worked up. Probably this program would be most successful with the DCS, however much of it could perhaps be done with RCB drilling.

Sedimented Ridges II: As outlined in the Sedimented Ridges DPG drilling prospectus. This program is tentatively scheduled for 1992.

VEMA: A multi-leg program using the off-set section drilling strategy could successfully address three highly-ranked LITHP themes: 1) layer 2/3 transition, 2) layer 3/mantle transition and 3) long section of layer 3. This program is mature and could be drilled with conventional RCB drilling/hard-rock guidebases. A full suite of large diameter logging tools could be deployed as part of the program.

Global seismic arrays: In order to make progress on establishing ocean broad-band seismic observatories for the global network, it is vital that the Hawaii Pilot hole be drilled as soon as possible--LITHP recommends 1992. The pilot hole is urgently needed to establish observatory protocols and to insure timely instrument design and testing. This program would take much less than one leg and could be completed during a transit or in combination with other drilling in the Central Pacific (e.g. Loihi Seamount).

Geochemical Reference Sites: As previously proposed. Results of Legs 125/126 increase the importance of drilling outboard of the trench.

Old Pacific: Site 801-C is clear and fitted with a reentry cone. LITHP urges that it be deepened to characterize the volcanic layer of Old Pacific Crust. This proposal complements Geochemical reference sites but does not replace it.

Early rifting: LITHP is strongly interested in the early rift history of continents, particularly those involving the emplacement of voluminous volcanic rocks. A working group to develop a drilling strategy should be formed to determine the best program possible. A large number of excellent proposals already are available, so the Working Group should be formed as soon as possible: LITHP and TECP jointly recommend that PCOM establish a working group in April 1990.

Endeavour Ridge hydrothermal deposits: These large sulfide deposits and hydrothermal fields are ideal for studying the active flow regime and alteration history. Drilling is part of a complete natural-laboratory study program.

Loihi: As previously proposed by CEPAC. This program probably require the DCS and could be drilled in combination with the Hawaii pilot hole for seismic observatories.

Axial Seamount: As originally proposed; requires the DCS.

Valu Fa: LITHP recommends that this site be chosen as an alternate site for Leg 135 by the Lau Basin working group, especially as the DCS probably will be on board.

Return to 735B: to reach the layer 3/mantle transition as previously proposed.

State of stress - Site 505: The DMP Lithosphere Characterization Initiative is germane to the issue of hole-spacing near 504B.

Lithosphere characterization: This new initiative is in its early stages of definition, however establishing the scale of heterogeneity in crustal properties is an important LITHP goal.

Oceanographer: No special requirements. (See Minutes 2.15 and 2.18)

Mathematicians Ridge: No special requirements, still needs some site survey work to be mature. (See Minutes 2.4)

Marquesas: No special requirements, proposal 291/E.

Chile Triple Junction: TJ-7 and hydrothermal objectives are of the greatest interest to LITHP.

Cayman Trough: Additional site survey work is still needed, proposal 333/A.

4.0 JOINT TECP-LITHP MINUTES

The joint meeting of the Lithosphere and Tectonics Panel was convened by I. Dalziel and R. Batiza. The two panels have many scientific interests in common, so the joint meeting presented a welcomed opportunity to discuss the best ways to insure progress on these questions using scientific drilling. An ambitious agenda was agreed upon and what follows are the joint minutes of the meeting.

4.1 Very Deep Drilling (J. Natland and K. Millheim)

The ODP Long-Range Plan discusses the importance and rationale of very deep; (>2 km) drillholes in the ocean. Such deep drilling is of obvious future importance for a variety of scientific goals, including some important scientific priorities of LITHP, TECP and SGPP. However, at present, the capability to achieve such deep objectives does not exist. One purpose, then, of the joint meeting was to discuss the future prospects of very deep drilling and to begin a discussion aimed at assessing the technical feasibility and costs of such drilling.

This discussion was initiated at the mid-February TEDCOM meeting in Utah and two participants in the meeting, Jim Natland and Keith Millheim of Amoco Production Company reviewed the early findings. As an example for discussion, Natland showed that to penetrate normal ocean crust with normal rotary drilling would require an 11.5 km drill string, new heavy duty casing and a great deal of drilling time. Millheim pointed out that extrapolation of needs and costs from past ODP experience, was probably not the correct approach. Instead, he suggested that very deep holes would have to be "custom-designed" newly and the tools would have to be tailored accordingly. Such a procedure throws open such questions as platform capabilities, development of entirely new drilling technologies and hardware and the need for careful long-term planning.

Drilling very deep holes is a great technical challenge and is not a trivial extension of existing ODP drilling. It should be approached in a careful phased manner. For this, Millheim considers it essential that the experience of experts in very deep on-land drilling (the Soviet Union and W. Germany) be brought to bear on the problem. The Japanese apparently are also planning for a very deep drilling capability at sea, so the task of very deep drilling is clearly international in scope and interest. The difficulty, estimated costs and development time for such a capability appear to go beyond what is possible within the present ODP program. However ODP can play an extremely important role by initiating the planning, engineering

development and tests that are needed. If such a capability is to exist in the time frame of the ODP Long-Range Plan (next 10-12 years), the planning must begin very soon.

It was suggested at TEDCOM that a **technically-oriented task force** be organized to initiate planning for very deep drilling. Such a task force could be organized with leadership from TEDCOM and participation by all interested thematic panels. In addition, it is vital that TAMU and the TAMU engineering group participate also. Our joint meeting strongly endorsed the notion that planning efforts for very deep drilling should go forward.

A closely related issue is the possibility of using the new DCS system as a mini-riser for drilling 2-3 km deep holes. Such a capability requires further development, but probably can be achieved within the next 2-4 years within ODP. This capability would make it possible to achieve a variety of very high-priority goals of TECP, LITHP and SGPP and thus is of very great interest. Our joint panels strongly encourage the continued development of the DCS systems for this purpose. It is possible, but perhaps not necessary, that very deep drilling and extending the DCS capability could be considered as subtasks by the same task group. On the other hand, perhaps extending the DCS capability should be considered separately. In either case, our joint panels consider it most important that extending the capabilities of the DCS be viewed as the next logical step for engineering development within ODP. Establishing the capability for very deep drilling and development of the mini-riser DCS for 2-3 km deep holes will both require a continued commitment by ODP to long-term technological development.

4.2 Volcanic Rifted Margins (VRM)

LITHP and TCP have a strong joint interest in learning more about early continental rifting and the reasons why passive continental margins commonly have very thick sections of rift-related volcanic rocks. We need a better understanding of mantle processes that occur before, during and after rifting, as well as the effects on the style of continental breakage. Scientific ocean drilling provides a very important tool for investigating this problem. As amply demonstrated by COSOD II the ODP long-range plan and the large number of drilling proposals that have been received, this problem is of first-order importance in modern geosciences.

However, partly because the volcanic sections at many VRMs are very thick (>5 km), an integrated strategy for study needs to be developed. Establishing this strategy and defining the role for drilling is not only essential for further progress but is also very urgent. We thus strongly urge that PCOM establish a working group on volcanic rifted margins at its April meeting. This group should consist of persons with expertise in passive margin studies as well as petrologists. Already, some members of the passive margin community have presented a document outlining one possible drilling strategy ("Drilling Volcanic Rifted Margins", H. C. Larsen and others). In addition, a large number of mature drilling proposals by several groups are available for discussion.

It is our understanding that Mike Coffin of UTIG has independently been preparing a Workshop Proposal for immediate submission to USSAC on this topic (including oceanic plateaus). The plan is for there to be a European co-convenor. This Workshop could serve as community wide input to the proposed Working Group which should, in our view, definitely exist before the Workshop is convened because of the urgent need for planning.

We propose that the following working group be established at the April meeting of PCOM (we suggest the following group of 11 scientists), PCOM may wish to appoint a "Watchdog(s)":

Volcanic Rifted Margins Working Group

I. Campbell (Australia)
S. Cloetingh (Netherlands)
M. Coffin (UTIG)
K. Cox (U.K.)
O. Eldholm (Oslo)
K. Hinz (BGR)
G. Houseman (Australia)
H. C. Larsen* (Geol. Survey Greenland)
A. Morton (British Geol. Survey)
J. Mutter (LDGO)
D. Sawyer (Rice U.)

*Suggested Chairman

We would expect the Working Group to participate in the Workshop and meet at least once and no more than twice thereafter to prepare a report soliciting revised drilling proposals that could then be evaluated by the Working Group, LITHP and TECP.

4.3 Status and Developments to the Diamond Coring System (DCS)

Steve Howard of the TAMU engineering group provided an interesting summary of the latest improvements to the DCS. The on-land tests are proceeding as planned and the system has undergone numerous design improvements. The rate of progress on the DCS system has been phenomenally good and both panels look forward eagerly to the full-scale tests of the DCS on Leg 132. S. Howard also answered numerous questions regarding the capabilities of the DCS and other active engineering development projects.

4.4 Results of Leg 129

Roger Larson, co-chief scientist on Leg 129 provided a brief summary of the drilling results of Leg 129 (old Pacific). Of greatest interest to LITHP and TECP is the fact that hole 801-C, which penetrated over 100 m of normal Jurassic, fast-spread ocean crust, is fitted with a reentry cone and is clean. A proposal to deepen this hole (368/E) was highly ranked by LITHP.

4.5 Tectonics of Mid-Ocean Ridges

Both TECP and LITHP have a strong interest in the activity of mid-ocean ridges. Traditionally, LITHP has emphasized the magmatic and hydrothermal aspects of ridges, but clearly the origin of ocean crust involves stretching, faulting and other tectonic processes. Our joint LITHP-TECP meeting provided a good forum for discussion of the tectonic activity at ridge crests. This discussion, led by E. Moores, served as an interesting focal point for joint LITHP/TECP interests. Clearly, progress on understanding the activity of mid-ocean ridges requires a committed multi-disciplinary effort, and future ODP drilling is a very important component of this effort.

4.6 Global Seismic Arrays

Mike Purdy presented a discussion of the need for establishing an array of 15-20 broad-band ocean seismic stations or observations. This long-term effort is an important initiative in the geosciences and ODP is vitally necessary in the beginning stages of the program in order to

help complete critical pilot studies. LITHP has provided strong support for this initiative. Our joint panels reaffirm the importance of establishing global seismic coverage and strongly urge that the Hawaii pilot hole be drilled as soon as possible.

5.0 OTHER BUSINESS

5.1 "Rumor" Proposals

It was noted that not all proposals considered by LITHP in its discussion and ranking were equally mature or even of equal status in some sense. For example, some documents with JOIDES office numbers (official proposals) are little more than letters of intent. LITHP considers it important that the international community recognize that such letter proposals are acceptable for long-range planning. LITHP encourages all investigators with ideas for possible drilling targets to send such letters to the JOIDES office.

5.2 Panel Replacements

Keir Becker is rotating off LITHP. We wish to thank Keir for his great help on LITHP and recommends that his replacement on LITHP be:

1) Dr. M. Langseth (LDGO)
2) Dr. M. Zoback (Stanford)
3) Dr. D. Moos (Stanford)

Dr. Toshi Fujii also is rotating off. We wish to extend our gratitude to Toshi for his long and valuable service to LITHP. We also wish to thank Dr. Julian Pierce, who will be replaced by Dr. Paul Browning. Julian will remain as the UK alternate LITHP representative.

5.3 Suggestions for IHP on Data Bank Entries

In response to IHP's solicitation for input on the information for the computerized data bank, LITHP recommends that the following be added, if a convenient form can be found: 1) X-ray diffractometer and 2) downhole information collected with non-Borehole-Research Group tools, e.g. TAMU downhole tools.

5.4 LITHP Representation on Working Groups

For the Sea-Level Working Group, LITHP appoints Dr. Seird Cloetingh. For the DMP Lithosphere Characterization Initiative, LITHP could be represented by Dr. James McClain.

5.5 LITHP Chairmanship

As its new chair, LITHP unanimously nominates Dr. Susan Humphris (WHOI).

5.6 Next Meeting

T. Fujii offered to host the next LITHP meeting in Tokyo, 11-13 October, 1990.

Annual Report (FY89) of JOIDES Lithosphere Panel

The activities of the JOIDES Lithosphere Panel (LITHP) are documented in detail in the minutes of its two latest meetings (28-30 March, Miami and September 8-12, FRG). In this report, I will list important accomplishments of the JOIDES lithosphere community and outline some of LITHP's concerns for future ODP scientific planning.

IMPORTANT EVENTS - 1989:

1.) Approval by PCOM and EXCOM of the ODP Long-Range Planning Document which spells out a staged long-term strategy for understanding the origin and evolution of ocean crust and lithosphere.

2.) JOI-USAAC sponsored workshop for drilling the oceanic lower crust and mantle (March, 1989 at Woods Hole). The value of this workshop is that it provides a detailed and logical approach to implementing the recommendations of the ODP Long-Range Plan. LITHP has prioritized the items which comprise the 10-year, 12-leg program of deep crustal and mantle drilling.

3.) LITHP reaffirms its commitment to the following themes for scientific drilling by ODP:

- penetration of normal ocean crust into mantle
- establishing global seismic arrays and ridge-crest observatories
- investigation of magmatic and hydrothermal processes of crustal accretion at a variety of spreading rates
- improved understanding of off-axis volcanism.

LITHP Concerns:

General: 1.) Implementation of the ODP long-range plan will require detailed planning to ensure that engineering capabilities are brought on-line in a timely fashion. LITHP feels that TAMU (with input from thematic and service panels and the community), in concert with PCOM is best qualified to carry out detailed, long-range planning.

2.) Role of DPG's: Without regional panels, it is still unclear how detailed and realistic drilling programs are to be crafted routinely from one or more drilling proposals. LITHP has had excellent success with using DPG's for this purpose (e.g. Sedimented Ridges DPG). LITHP suggests therefore that DPG's fill this role in the future. This activity necessarily involves at least two distinct functions: a) reviewing proposals to determine whether they meet general thematic guidelines for a successful attack on a high-priority scientific question and b) optimizing the elements of existing proposals to create a well-balanced, scientifically strong and realistic detailed drilling program.

3.) PCOM decisions: LITHP feels that a better disciplinary balance on PCOM is important for promoting the best possible scientific drilling decisions.

Specific: 1.) LITHP will continue to support drilling at "Geochemical Reference Sites" in the western Pacific.

2.) Logging of high-temperature holes and/or slim DCS holes is essential for scientific success of many LITHP drilling programs in CEPAC and beyond.

3.) For FY91, LITHP ranks are:

1.) 504B
2.) Sedimented ridges
3.) EPR bare rock
4.) Chile Triple junction
5.) Cascadia margin
6.) East Pacific Neogene.

4.) A DPG for EPR bare rock drilling is urgently needed and should meet in January or February 1990.

5.) A DPG to assess deep crustal drilling, in either the Atlantic or Pacific is urgenly needed to set guidelines, evaluate proposals and formulate drilling programs.

6.) LITHP urges that its objectives on Leg 130 (Ontong-Java Plateau) be assigned a high priority for drilling. Continued erosion of these objectives jeopardizes the overall success of multi-objective drilling programs which OJP represents.

7). For the eventual success of global seismic arrays, LITHP urges that more re-entry cones be routinely deployed by ODP.

JOIDES TECTONICS PANEL MEETING MARCH 5-7, 1990
NEW ORLEANS, LOUISIANA

DRAFT MINUTES

PRESENT:
Ian Dalziel, UTIG, Chairman
Tanya Atwater, UC Santa Barbara
Jacques Bourgois, France
Roger Buck,L-DGO
Dave Engebretson, U. of Western Washington
Mike Etheridge, Australia
Kim Klitgord, USGS
Hans-Christian Larsen, ESF
Casey Moore, UC Santa Cruz
Eldridge Moores, UC Davis
Yujiro Ogawa, Japan
Mike Purdy, WHOI
Dale Sawyer, Rice U.
Graham Westbrook, UK

APOLOGIES: Karl Hinz, FRG

LIAISONS:
Shirley Dreiss, SGPP
John Ladd, NSF
Catherine Mevel, LITHP
Ralph Moberly, PCOM (also attending LITHP)
Robin Riddihough, CEPAC
Laura Stokking, ODP
Brian Tucholke, PCOM

INTRODUCTION

The Chairman welcomed new panel members Tanya Atwater, Casey Moore and Mike Purdy. He outlined the Agenda, and pointed out that the Panel should also consider appointment of a new Chairman for after the fall 1990 meeting as he will by that time have served for three years and will, in addition, be prevented from attending the Annual Meeting in early December 1990 by a commitment to field work in the Antarctic at that time.

AGENDA

Minutes
Reports of Liaisons
Proposal Review
Joint Meeting with LITHP
Prioritization of Programs
Next Meeting
Panel Membership
Panel Chairmanship

MINUTES

The minutes of the fall 1989 meeting in Honolulu, Hawaii, were adopted unanimously subject to the correction of two typographic errors.

REPORT OF LIAISONS

PCOM: Brian Tucholke reported on PCOM's plans for 1991 drilling and tentative plans for 1992. He indicated that in spite of the latter, TECP should reconsider CEPAC targets beyond 1991 with other global programs for the years 1992 through 1995.

The USSR participation is once again being reviewed.

A DPG has been set up to plan Cascadia margin drilling.

A structure is to be set up to handle liaison with other global earth science organizations.

TEDCOM: Dale Sawyer reported on the recent TEDCOM meeting at Salt Lake City, Utah, to discuss deep drilling.

CEPAC: Robin Riddihough reported on the recent CEPAC meeting at L-DGO.

SGPP: Graham Westbrook reported on the SGPP meeting at Santa Cruz, California, outlining the priorities established by that panel for the 4 years of drilling beyond 1991.

PCOM (again): Ralph Moberly (attending both the TECP and LITHP meetings) outlined PCOM's needs for a prioritization by TECP of drilling programs for the 4 years beginning October 1991.

PROPOSAL REVIEWS

265 - TECP notes with interest the plans for new data on this unusual tectonic feature, and is glad to learn of plans to revise the proposal. It is not, however, in a position to revise its former ranking in the absence of a new proposal.

286 - TECP acknowledges the high priority given to deepening Hole 504B to the layer 2/3 boundary. The Panel understands, however, that the drilling may already have encountered at least one fault. In view of this fact and of the prominent role of listric normal faults in many ophiolitic analogues of oceanic crust, it seems clear that further brittle and ductile structures are to be expected as the hole is deepened. Accordingly, TECP recommends that a structural geologist be included in the shipboard party when the hole is deepened. Ranking - #2.

317 - The TECP believes that the program for long-term monitoring is the most outstanding and important features of this proposal. The case made for diffuse flow is also an important feature. Some Panel members were concerned as to exactly how the hole in the zone of incoherent reflectors is actually going to test for that incoherency, i.e. they believe that there is a scale mismatch between the seismic imaging and the core. In other words, even if indeed the sediments cored are cut by fractures and cataclastically deformed, how will it be possible to be certain that these features cause the incoherent acoustic response? Recommendation - the proposal should be considered by the Cascadia DPG and integrated into the drilling program.

330 - TECP appreciates that the Mediterranean Ridge is an interesting tectonic feature, but it reiterates that it needs to be demonstrated that the ridge has something special to contribute to our understanding of accretionary wedge tectonics globally. While the proposal stresses the collisional context of the ridge, it is not apparent to some members of the Panel just how important that aspect is, i.e. the collision may not have gone far enough to play a significant role and thus distinguish this wedge. Many Panel members feel that the role of salt may play a unique role, and make the Mediterranean Ridge unique in reflecting the tectonics of Tethyan mountain belts in particular. The fact that many orogenic belts arise from the inversion of small oceanic basins may also be a factor in favor of trying to understand better the evolution of this ridge.

In order to further consider this proposal, however, TECP requires a multi-channel seismic survey of the proposed drilling area, comparable to those available from the Nankai, Cascadia and Barbados wedges. The data need to be processed through migration. We need to have line drawings showing the exact position and depth extent of the proposed sites. Depth conversion of the sections would be desirable. Ranking - #3.

351 - TECP noted the likelihood of an upcoming MCS survey by R/V *Bernier* and looks forward to receiving an updated proposal.

352 - Although the TECP recognizes the potential value of using abandoned spreading centers as "windows" into the lower crust, it does not perceive substantial tectonics objectives in this proposal. Most important, TECP perceives major deficiencies in the strategy and siting.

The validity of spreading rate comparisons with Hole 735B is doubtful because of major uncertainties in the effective spreading rate at the instant of emplacement of the material sampled.

A well-defined structural setting is essential for "offset" holes to be of value, and in the opinion of TECP it is missing here. Exactly how would the sampled material fit in with a model of the process of ridge abandonment? The structural model needs to be well constrained by observational data, presumably seismic.

The case needs to be made that this is an optimum place to tackle the failed rift problem. Also, it is not clear just how the drill will shed light on this process. It is difficult to shed light on tectonic problems with a single hole.

Hence, we judge this to be an immature proposal that requires the support of considerably more survey work, for example on the setting and not just on the immediate site. Ranking - #3.

353 - TECP found this to be a potentially interesting proposal to study ridge subduction (or at least ridge-trench interaction) as a complement to the planned Chile Rise drilling program. The apparently simpler structure here due to the lack of continued subduction is attractive.

Potential problems identified by TECP include:

1. The strategy of dense drilling in one transect and sparse on another should probably be replaced by one of more balance, especially in the light pf point #2.

2. The location of the key transect in the "10 my since ridge-crest subduction" zone seems inappropriate. The ridge segment in question is very short. End effects at the fracture zones are likely to make modelling difficult or even impossible. Ideally the transects should be relocated on segments of the margin with longer ridge segments.

3. The Panel would like to see a model for what the proponents expect the subsidence curves to show, and how the selected sites will result in constraints on the parameters of that model.

   What is the effect of glacial loading/unloading on the subsidence history. Panel members expressed concern that glacial seismic stratigraphy is very different from nonglacial seismic stratigraphy normally encountered, and will make interpretation difficult. Others expressed concern about the effect of glacial bottoming on the shelf on subsidence.

4. TECP noted that new surveys could be made in 1990-91 and 1991-92, and urged that deeper penetration data be obtained.

5. Finally, Panel members observed that there does not appear to be much of the uplift history visible, let alone accessible. While recognizing the difficulty, we would like to know how the proponents would expect to extract data on the uplift.

Ranking - #3.

355 - TECP considered that, while the study of gas hydrates is not *per se* of thematic interest, hydrates may impact upon the deformation of an accretionary wedge. Moreover, the information that gas hydrates provide on temperature is also of value in the interpretation of the behavior of wedges and the fluids escaping from them.

If the outcome of the proposed drilling were to be that restrictions placed upon drilling in many convergent margins by the presence of gas hydrate BSR's could be reduced, that would be of general benefit. The Panel was not sanguine, however, that the SSPP would feel that such drilling could in fact be safely undertaken.

It was not felt that information on the uplift and subsidence that might be gained from the two sites in the Lima basin would constitute a sufficiently great increment beyond the results of Leg 112 to make the sites high priority in their own right.

Hence the TECP has considerable interest in seeing drilling through a gas hydrate proceed if high-priority drilling on the Cascadia and Chile margins could not otherwise be permitted. It could, however, only support the Peru margin sites in the event that the SSPP feels these to be the only acceptable sites.

356 - The primary objective of this proposal is Cenozoic ocean- and climatic-history in the NE Atlantic, and hence it is outside the mandate of TECP. The proposal does, however, address the problem of transverse ridges in the NE Atlantic and their influence on the exchange of water masses. The proponents claim, without documentation, that the vertical movements of such large crustal blocks as the Greenland-Scotland Ridge and the Jan Mayan Ridge occurred too fast to be merely thermal events, and suggest intraplate stress as an alternative mechanism. This general theme is of interest to TECP, but it would have to be explained and documented in far greater detail than in the present proposal in order to attract a high-priority rating. Ranking - #2.

357 - The area is well surveyed for drilling and is clearly an excellent example of a fast-spreading ridge. The sites are well chosen. TECP is particularly excited about the comparison of the volcanic and fault structures at the first two sites:

1. To see the growth and development of the layer 2 extrusives between the center and edge of the neotectonic zone - i.e. how oceanic crust is constructed;

2. To learn why layer 2 decreases in velocity between the center and the edge, i.e. to test the hypotheses that the flows are solid in the center and fractured subsequently, and that the center is predominantly dikes and the margins have a greater proportion of flows,

   Site 2 is very near to a large hydrothermal field. While the hydrothermal aspect is interesting TECP hopes that the goal of characterizing layer 2 in the third dimension is kept as a high priority.

   TECP recommends that the shipboard party includes a structural geologist capable of mining microstructural information from the cores.

358 - The proposal addresses a high priority theme of TECP. The Panel sees, however, some problems in obtaining direct "tectonic" information from the proposed drilling. This is a matter of general concern with this and other volcanic rifted margin proposals. Accordingly the proposal has been ranked #3 although the theme ranks at the top.

In order to improve the overall drilling strategy for the theme, TECP and LITHP in a joint session (see below in minutes) decided to recommend that PCOM set up a Working Group to address the problem of drilling volcanic rifted margins in general.

With regard to this specific proposal, TECP felt that the Voring area is particularly well suited for drilling the regions referred to in the Larsen et al memorandum as Zones I and inner Zone II. TECP was concerned, however, about complexities in the early rift history (ridge crest migration and jumping). These may impact on strategies for drilling outer Zone II and Zone III.

Tentative TECP ranking of sites in Proposal 358 (for consideration by the proponents and/or a Working Group) is as follows (descending order): VM1, VM2, VM3. Lowest ranking goes to VM 4, 5, and 6, VM 2 and VM 3 might be combined into a fairly deep penetration site close to VM2.

359 - see 365

360 - The proposal addresses no thematic issues of interest to the Tectonics Panel. However, a revised proposal that dealt more comprehensively with the tectonic setting of the proposed sites could be of thematic interest to TECP. In view of the obvious analogue (referred to in passing by the proponents) with ophiolite complexes such as the Troodos complex, such a revised proposal should speak more directly to this analogy and to the possibility of resolving some of the controversy concerning the ocean crust/ophiolite comparison. Ranking - #2.

361 - This proposal is seriously deficient in its discussion of the tectonic setting of the proposed holes. The studies of Karson and his colleagues, and the clear analogue between the TAG area and ophiolitic complexes such as the Troodos, clearly indicate the prominent role of faulting in the development of the oceanic crust, and in the hydrogeologic system resulting in the formation of the ore deposits. These considerations clearly indicate to TECP that revision of the hole siting strategy is in order if the objectives of the proposal are to be achieved. We urge that Jeff Karson be directly involved in a revision of the proposal with the above ends in view. Ranking - #2a.

362 - TECP continues to believe that this proposal addresses a highest priority theme and presents exciting possibilities for addressing fascinating tectonic problems. However, the Panel is extremely concerned that there is urgent need for better presentation and interpretation of the seismic data in order for a detailed evaluation of the individual sites to be possible. Clearly such an evaluation needs to be undertaken no later than the Panel's fall meeting. The Chairman is to convey the concern of the panel to the proponents as a matter of urgency, pointing out to them that TECP's continuing support of the Chile Rise drilling program is at risk. A copy of Mike

Etheridge's review of the proposal that was prepared for the Panel is to be forwarded to the proponents.

363 - The proposal has several objectives. One is to determine whether the SE Newfoundland Ridge and adjacent margin-parallel bathymetric highs were formed by the same mantle plume that formed the Fogo Seamounts. This is of secondary interest to the Tectonics Panel. Another objective is to determine the age and origin of the unconformity at the top of the SENR basement. To the extent that this helps to constrain the time of margin formation, this objective is of higher thematic interest to TECP.

An implicit objective is to determine the effect of plume volcanism on margin formation. This objective has to be considered in the light of two larger-scale programs for drilling rifted non-volcanic and volcanic margins in the North Atlantic region (see 358 and 365). Taken as it stands the proposal is ranked #2a.

364 - The proposal is for one deep hole (1000m) in crystalline basement involved in the Sardinian-African continental collision in order to drill through a strong north-dipping reflector identified in seismic data. From comparison with land geology, this boundary is identified as the thrust boundary between European and African crust. The main phase of related deformation occurred between 24 and 19 Ma when the Corsica-Sardinia microplate rotated away from southern Europe.

The main purpose of the proposed hole is to determine the rheologic nature of the deformation, the character of the fluids involved, and the physico-chemical rock parameters associated with the thrust. While the strategy presented to study the boundary is good, the earthquake epicenter locations and seismic data do not make a convincing case for the deformation continuing to be active (despite the comments of the proponents to the contrary). Sedimentary layers appear to overlie the thrust, which therefore appears to have been inactive since the Late Miocene. The proposed drilling program would be of far higher thematic interest to TECP if the boundary were still active. Ranking - #2.

365 - The proposed program to investigate the synrift and post rift sedimentary units and underlying crust on this moderate sedimentation rate set of conjugate margins helps to address one of the main thematic objectives of the Tectonics Panel. The nature of these rifted margin pairs, together with existing drill hole data and geophysical data sets provide a strong basis upon which a non-volcanic rifted margin drilling program can be based. The proposal is ranked #4.

In the view of TECP, the proponents need to focus more effort on "improving" the record of synrift and early postrift sedimentary units, including migrated depth sections, balanced cross-sections, and higher resolution records of the prerift and synrift units. The results of industrial drilling and available seismic data need to be more clearly integrated into the analyses using balanced cross-sections, in order to develop the drilling strategy. A comparison with the complicated synrift structural patterns from other areas needs to be included in the site evaluations. In general, a significant effort needs to be put into identifying the distinctive tectonic processes to be addressed and how the drilling strategy will elucidate these processes.

The Tectonics Panel wishes to encourage the proponents to pursue both transects across the conjugate margins in their development of a more refined drilling program. This will provide a set of viable options as the proposal matures, with a final plan embracing one or both transects.

366 - The Tectonics Panel noted the proponents intention to undertake a geophysical survey in an area of high thematic interest, and looks forward to receiving the proposal.

368 - TECP had little time to review this proposal that arrived just before the meeting. The Panel was interested in the results of the recent drilling at Site 801A, although some concern lingered as

to whether the igneous rocks at the bottom of the hole were indeed true oceanic basement. The new proposal was ranked #2a.

369 - TECP had little time to review this proposal that arrived just before the meeting. The area is of considerable interest to the Panel, and it appreciated the discussion of faulting and deformation problems of the region that are contained in the proposal. The proponents need to consider what can be done with the drill unravel the development of what appears to be a segment of oceanic crust that has experienced amagmatic extension. It seems to TECP that a transect of holes is needed. The proponents might think of adding more scientists with structure/tectonics background to their group in order to develop a program to accomplish this. The present proposal is ranked #2a.

Proposal 370 - The Panel had little time to consider this proposal that arrived just before the meeting. A more mature proposal will be reviewed with interest. TECP continues to have concern that the so-called "offset" approach to drilling the oceanic lithosphere inevitably leads to uncertainties with regard to the tectonic/structural setting of the proposed holes. Proponents need to be especially cognizant of this problem and address the issue as fully as possible in their proposals.

Proposal 373 - The Panel had little time to review this proposal as it arrived just before the meeting. It does address high-priority themes of TECP and to date seems to be the only ODP proposal specifically aimed at the issue of the state of stress in the oceanic lithosphere. Some Panel members were concerned about the length of time needed for drilling.

JOINT MEETING WITH LITHOSPHERE PANEL

The joint meeting of the Lithosphere and Tectonics Panel was convened by I. Dalziel and R. Batiza. The two panels have many scientific interests in common, so the joint meeting presented a welcomed opportunity to discuss the best ways to insure progress on these questions using scientific drilling. An ambitious agenda was agreed upon and what follows are the joint minutes of the meeting.

Very Deep Drilling (J. Natland and K. Millheim)

The ODP Long-Range Plan discusses the importance and rationale of very deep (>2 km) drillholes in the ocean. Such deep drilling is of obvious future importance for a variety of scientific goals, including some important scientific priorities of LITHP, TECP and SGPP. However, at present, the capability to achieve such deep objectives does not exist. One purpose, then, of the joint meeting was to discuss the future prospects of very deep drilling and to begin a discussion aimed at assessing the technical feasibility and costs of such drilling.

This discussion was initiated at the mid-February TEDCOM meeting in Utah and two participants in the meeting, Jim Natland and Keith Millheim of Amoco Production Company reviewed the early findings. As an example for discussion, Natland showed that to penetrate normal ocean crust with normal rotary drilling would require an 11.5 km drill string, new heavy duty casing and a great deal of drilling time. Millheim pointed out that extrapolation of needs and costs from past ODP experience, was probably not the correct approach. Instead, he suggested that very deep holes would have to be "custom-designed" and the tools would have to be tailored accordingly. Such a procedure throws open such questions as platform capabilities, development of entirely new drilling technologies and hardware and the need for careful long-term planning.

Drilling very deep holes is a great technical challenge and is not a trivial extension of existing ODP drilling. It should be approached in a carefully phased manner. For this, Millheim considers it essential that the experience of experts in very deep on-land drilling (the Soviet Union and W. Germany) be brought to bear on the problem. The Japanese apparently are also planning for a very

deep drilling capability at sea, so the task of very deep drilling is clearly international in scope and interest. The difficulty, estimated costs and development time for such a capability appear to go beyond what is possible within the present ODP program. However, ODP can play an extremely important role by initiating the planning, engineering development and tests that are needed. If such a capability is to exist in the time frame of the ODP Long-Range Plan (next 10-12 years), the planning must begin very soon.

It was suggested at TEDCOM that a technically-oriented task force be organized to initiate planning for very deep drilling. Such a task force could be organized with leadership from TEDCOM and participation by all interested thematic panels. In addition, it is vital that TAMU and the TAMU engineering group participate also. Our joint meeting strongly endorsed the notion that planning efforts for very deep drilling should go forward.

A closely related issue is the possibility of using the new DCS system as a mini-riser for drilling 2-3 km deep holes. Such a capability requires further development, but probably can be achieved within the next 2-4 years within ODP. This capability would make it possible to achieve a variety of very high-priority goals of TECP, LITHP and SGPP and thus is of very great interest. Our joint panels strongly encourage the continued development of the DCS systems for this purpose. It is possible, but perhaps not necessary, that very deep drilling and extending the DCS capability could be considered as subtasks by the same task group. On the other hand, perhaps extending the DCS capability should be considered separately. In either case, our joint panels consider it most important that extending the capabilities of the DCS be viewed as the next logical step for engineering development within ODP. Establishing the capability for very deep drilling and development of the mini-riser DCS for 2-3 km deep holes with both require a continued commitment by ODP to long-term technological development.

Volcanic Rifted Margins (VRM)

LITHP and TECP have a strong joint interest in learning more about early continental rifting and the reasons why passive continental margins commonly have very thick sections of rift-related volcanic rocks. We need a better understanding of mantle processes that occur before, during and after rifting, as well as the effects on the style of continental breakage. Scientific ocean drilling provides a very important tool for investigating this problem. As amply demonstrated by COSOD II the ODP long-range plan and the large number of drilling proposals that have been received, this problem is of first-order importance in modern geosciences.

However, partly because the volcanic sections at many VRMs are very thick (>5 km), an integrated strategy for study needs to be developed. Establishing this strategy and defining the role for drilling is not only essential for further progress but is also very urgent. We thus strongly urge that PCOM establish a working group on volcanic rifted margins at its April meeting. This group should consist of persons with expertise in passive margin studies as well as petrologists. Already, some members of the passive margin community have presented a document outlining one possible drilling strategy ("Drilling Volcanic Rifted Margins", H.C. Larsen and others). In addition, a large number of mature drilling proposals by several groups are available for discussion. It is our understanding that Mike Coffin of UTIG has independently been preparing a Workshop Proposal for immediate submission to USSAC on this topic (including oceanic plateaus). The plan is for there to be a European co-convenor. This Workshop could serve as community wide input to the proposed Working Group which should, in our view, definitely exist before the Workshop is convened because of the urgent need for planning.

We propose that the following working group be established at the April meeting of PCOM (we suggest the following group of 11, PCOM may wish to appoint a "Watchdog(s)":

Volcanic Rifted Margins Working Group

I. Campbell (Australia)
S. Cloetingh (Netherlands)
M. Coffin (UTIG)
K. Cox (U.K.)
O. Eldholm (Oslo)
K. Hinz (BGR)
G. Houseman (Australia)
H. C. Larsen* (Geol. Survey Greenland)
A. Morton (British Geol. Survey)
J. Mutter (LDGO)
D. Sawyer

*Suggested Chairman

We would expect the Working Group to participate in the Workshop and meet at least once and no more than twice thereafter to prepare a report soliciting revised drilling proposals that could then be evaluated by the Working Group, LITHP and TECP.

Status and Developments to the Diamond Coring System (DCS)

Steve Howard of the TAMU engineering group provided an interesting summary of the latest improvements to the DCS. The on-land tests are proceeding as planned and the system has undergone numerous design improvements. The rate of progress on the DCS system has been phenomenally good and both panels look forward eagerly to the full-scale tests of the DCS on Leg 132. S. Howard also answered numerous questions regarding the capabilities of the DCS and other active engineering development projects.

Results of Leg 129

Roger Larson, co-chief scientist on Leg 129, provided a brief summary of the drilling results of Leg 129 (old Pacific). Of greatest interest to LITHP and TECP is the fact that hole 801-C, which penetrated over 100 m of normal Jurassic, fast-spread ocean crust, is fitted with a reentry cone and is clean. A proposal to deepen this hole (368/E) was highly ranked by LITHP.

Tectonics of Mid-Ocean Ridges

Both TECP and LITHP have a strong interest in the activity of mid-ocean ridges. Traditionally, LITHP has emphasized the magmatic and hydrothermal aspects of ridges, but clearly the origin of ocean crust involves stretching, faulting and other tectonic processes. Our joint LITHP-TECP meeting provided a good forum for discussion of the tectonic activity at ridge crests. This discussion, led by E. Moores, served as an interesting focal point for joint LITHP/TECP interests. Clearly, progress on understanding the activity of mid-ocean ridges requires a committed multi-disciplinary effort, and future ODP drilling is a very important component of this effort.

Global Seismic Arrays

Mike Purdy presented a discussion of the need for establishing an array of 15-20 broad-band ocean seismic stations or observations. This long-term effort is an important initiative in the geosciences and ODP is vitally necessary in the beginning stages of the program in order to help complete critical pilot studies. LITHP has provided strong support for this initiative. Our joint panels reaffirm the importance of establishing global seismic coverage and strongly urge that the Hawaii pilot hole be drilled as soon as possible.

PRIORITIZATION OF GLOBAL PROGRAMS FOR THE NEXT 4 YEARS

Tectonics Panel considered all existing proposals for drilling tectonic targets in all the world's oceans over the four years following the program already approved by PCOM in the Pacific. The proposals were considered in terms of potential programs to address the five principal themes set out by TECP in its White Paper already published in the JOIDES Journal. Technical and political feasibility were also taken into account. Votes on programs within the individual themes were followed by a vote on the prioritization of the programs across theme boundaries, the resulting ranking is as follows:

(Relevant proposal number(s) and recommended number of drilling legs in a 4 year time slot are provided in brackets)

1. **Chile triple junction**
   (Proposal 362 - 2 legs of a 2 leg program)
2. **North Atlantic non-volcanic rifted margins**
   (Proposals 334, 365, 366 - 2 legs of a program of approximately 6 legs)
3. **Cascadia convergent margin***
   (Proposals 233 and 317 - 1-2 legs of a 1-2 leg program)
4. **Oahu geophysical observatory pilot project**
   (Proposal 315 - 10 days; could be first of approximately 15 stations)
5. **North Atlantic volcanic rifted margins***
   (Proposals 310, 311, 328, 358 and 363 - 2 legs of a 4 leg program)
6. **Barbados accretionary wedge**
   (Proposal 342 - 2 legs of a 4 leg program)
7. **Equatorial Atlantic transform margins**
   (Proposals 313 and 346 - 1 leg of a 1 leg program)
8. **North Australian collisional margin**
   (Proposal 340 - 2 legs of a 2 leg program)
9. **Antarctic Peninsula margin**
   (Proposals 297 and 351 - 2 legs of a 2 leg program)
10. **Cayman trough**
    (Proposal 333 - 1 leg of a 1 leg program)
11. **M-series anomalies in western Pacific**
    (Proposal 287 etc - 1 leg of a 1 leg program)
12. **Stress measurements at Site 505**
    (Proposal 373 - 1-2 legs of a 1-2 leg program)
13. **Bering Sea**
    (Proposals 34, 182, 207, 225, 229, and 234 - 1 leg of a 1 leg program)
14. **Caribbean crust**
    (Proposal 343 - 1 leg of a 1 leg program)
15. **Cretaceous sea mounts in western Pacific**
    (Proposal 280 etc - 2 legs of a 2 leg program)

*Indicates a Detailed Planning Group or Working Group has been established or requested to plan this program

Notes:

1. **The Tectonics Panel is strongly in favor of drilling fast- and slow-spreading ridges and "offset" holes in order to investigate the structural**

evolution of the oceanic lithosphere. It is taking steps to formulate a drilling strategy to this end.

2. **The Tectonics Panel wants to ensure that stress measurements are made at all suitable sites.**

NEXT MEETING

TECP decided to request that its next meeting be held in Paris, France November 1, 2, and 3 1990. Jacques Bourgois graciously agreed to look into local arrangements to host such a meeting. The Chairman and SGPP Liaison Shirley Dreiss volunteered to approach Chairman Erwin Suess of SGPP with regard to the possibility of having a joint TECP-SGPP meeting at that time as SGPP will also be meeting in Paris, and there are several areas of mutual concern.

PANEL MEMBERSHIP

Karl Hinz, in expressing his regrets to TECP for being unable to attend the present meeting due to a ship schedule alteration, indicated that he will be rotating off the Panel. He expressed his thanks and good wishes to the Panel members. In turn the rest of TECP wishes to express its thanks to Karl Hinz for a long and vigorous membership.

PANEL CHAIRMANSHIP

Ian Dalziel informed the Panel that the next meeting will probably be his last one after six years on TECP including three as Chairman. He invited nominees for a successor as Chairman from the members of the Panel, and promised to pass on all of these, together with his recommendation, to PCOM.

OTHER BUSINESS

1. As a result of long discussion in this and earlier meetings on the position of TECP with regard to drilling to investigate the tectonic evolution of the oceanic lithosphere, Eldridge Moores was invited to draw up a paper in this regard for consideration at the next TECP meeting. He agreed to do so.

2. Because of mounting concern about the quality of presentation of the structural setting of proposed drill sites, Mike Etheridge was invited to prepare a draft paper of TECP's position in this regard for consideration at the next meeting. He agreed to do so.

The meeting was adjourned at 5 pm on Wednesday March 7, 1990.

Ocean History Panel, March 29-31

Executive Summary

OHP reaffirmed that the Eastern Equatorial Pacific program scheduled for Leg 138 remains their highest priority undrilled program.

OHP generated the following prioritized list of programs:

1 - Northernmost Atlantic Paleoceanography; proposals 320/A, 336/A, 305/A;
2 - North Pacific Neogene: the package created by CEPAC at the request of SOHP/OHP from proposals 259/E, 247/E etc.;
3 - New Jersey (sea level) proposal 349/A;
4 - Guyots; proposal 203/E;
5 - Bering Sea; CEPAC prospectus from proposals 182/E, 195/E;
6 - Atolls; proposal 335/E;
7 - South equatorial Atlantic; proposal 347/A;
8 - California Current; proposal 271/E;
9 - Southwest Pacific (sea level) from proposals 337/E and/or 338/E and/or 367/E;
10 - Shatsky Rise; CEPAC prospectus from proposal 253/E;
11 - Mediterranean gateways; proposals 323/A and 372/A;
12 - West Florida margin (sea level) proposal 345/A

Notes for PCOM on the prioritized OHP list:

1- The two highest ranked programs represent essential high latitude components of the major program to study high-frequency climatic variability and its evolution through the Neogene; both are very full and well planned programs that will contribute several categories of very important data, and both are well designed in order to test specific hypotheses.

2- The western part of the equatorial Atlantic should be the next component of our low-latitude circuit represented by legs 108, 115, 130 and 138; it is ranked low (7th) because we only have a single preliminary proposal.

3- Ranked 3rd is what OHP judges to be the best of the proposals addressing the Sea Level objective; although the proposal (New Jersey margin) is preliminary pending site survey, this is funded and will be carried out in May 1990. A complimentary study from a different margin will probably be carried out in the Southwest Pacific but the proposals for that area are all very preliminary at present. Proposal 345/E was rated 6th based primarily on its potential contribution to our understanding of the sea level problem using an independent approach.

4- Ranked 4th is proposal 203/E (Guyots) on the basis of its potential contribution to our understanding of a hugely important aspect of Mesozoic ocean history: the Pacific reef province and its demise. OHP has also drawn attention to the importance for Cenozoic paleoceanography of recovering sequences from the pelagic caps of some of these Mesozoic guyots.

5- The ranking of the Bering Sea at 5th is based on both the potential contribution of Sounder Ridge sequences to Mesozoic ocean history, and the very high resolution late Neogene records that will be recovered there.

6- Ranked 8th is proposal 271/E and revs (California Current). This represents the next component of the (S)OHP Paleo-upwelling program to investigate the history and structure of high productivity areas (Legs 108, 112, 117). The proposal has been updated in response to earlier comments and will make a major contribution to the study of this theme.

7- The low ranking of Shatsky Rise may of course change as a result of the forthcoming Engineering Leg.

A number of recent proposals were not ranked although OHP believes that many of them will develop into proposals of which all or part will be highly ranked:

Antarctic: 351/C, 353/C , 244/C;
Southeast Atlantic: 339/A, 354/A;
Southwest Atlantic: 381/A, 327/A;
Northeast Atlantic: 326/A;
Northwest Atlantic: 341/A, 365/A, 359/A;
Equatorial Atlantic: 329/A, 313/A;
South Pacific: 340/D;
Mediterranean: 330/A.

This list is not prioritized, but OHP see a particular need for further work in the South Atlantic (East and West) and in the Antarctic, and advise PCOM to be aware of this in making long-range plans. In addition, OHP remain of the opinion that technology should be developed to enable the Deep Stratigraphic Test program to be initiated, probably with a Somali Basin site.

OHP accepts the present publication targets with two reservations:

1. Up to the final make up deadline, flexibility must be exercised with involvement of the Editorial Board and NOT left solely in the hands of production staff who may make inappropriate judgements.

2. Every effort must be made to ensure that authors whose manuscripts are accepted for review are not turned down through delays in the review process. This is especially important since a member of the Editorial Board may be, or may be perceived to be, the cause of the delay. ODP should find a means of publishing late papers since they often contain important data that are not readily published elsewhere.

OHP remain interested in the ability to recover organic-rich sediments on the continental margins because of their importance for Paleo-productivity studies. Efforts should be made to refine the methods by which safety is established so as to extend the working range in such areas.

Ocean History Panel

DRAFT MINUTES

Ocean History Panel met on Thursday March 29th at 08:30 in the Tagore Room at the University of Honolulu, Hawaii hosted by the PCOM Office.

Present were: N. Shackleton (chair); R. Moberly (PCOM Chair); G. Brass (PCOM liaison); A. Palmer-Julson (TAMU liaison); B. Malfait (NSF); D. Rea (CEPAC chair); P. Cooper (JOIDES office); L. d'Ozouville (JOIDES Office); G. Waggoner (JOIDES Office); G. Smith (LITHP liaison); W. Berger; W. Berggren; T. Bralower; P. Davies; M. Delaney; A. Droxler; E. Jansen; D. Kent; T. Loutit; A. Mix; T. Saito; R. Stein; E. Vincent. E. Barron was unable to attend.

OHP welcomed Audrey Meyer's decision that it it now again possible for TAMU to send a liaison to meetings of thematic panels; we regard it as essential that the thematic panels are up-to-date with the progress of the project, and that TAMU are in touch with the scientific drive of the project.

Laurent d'Ozouville provided a set of abstracts of recent proposals. OHP applauds this initiative. It was suggested that in future the standard letter of acceptance of a proposal should request an abstract (of not more than half a page, say), informing the proponent that if this is not received the proposal will be abstracted by the JOIDES office; this should reduce the amount of work that the JOIDES office needs to do since proponents should realize that their own abstract is likely to represent their interests better than an office abstract.

TAMU Report (A. Palmer-Julson)

The results of ODP 128 and 129, both of which had some interest for OHP, were presented (130 was deferred since 4 OHP members had been on board). Co-Chiefs have been selected up to leg 138 as follows: 131 Nankai: A. Taira, I. Hill; 132 Engineering: J. Natland; 133 NW Australia: P. Davies, J. McKenzie; 134 Vanuatu G. Greene, J.-Y. Collot; 135 Lau Basin: L. Parson, Hawkins; 136 Egineering III no scientific co-chief named yet; 137 Juan de Fuca E. Davis, M. Mottl; 138 E Eq Pacific L. Mayer, N. Pisias. The current start and finish dates and port calls are in JOIDES JOURNAL Feb. 1990 p 2.

Engineering: The Diamond Coring System is currently being tested on land in Utah; it is possible that it may be available for use on Leg 133 if engineering tests are successful. Publications.

Initial Reports volumes are available up to Leg 122; Leg 123 will appear shortly and up to leg 128 should be out within FY 1990. Scientific Results are available up to Leg 107, with leg 108 available soon; it is hoped that up to 116 (except 114) will be out in FY 1990.

The impact of the current push to bring publication schedules on target (regarded as essential if ODP is to survive outside scrutiny) was discussed extensively. OHP members are concerned that valuable material is being lost as a result of failure to meet publication deadlines:

1) OHP consider that some kind of flexibility must be found to accommodate manuscripts that have been submitted by an agreed deadline and are then delayed by the review

process; bearing in mind that the Editorial Board are themselves qualified it may be necessary to compromise on the number or suitability of outside reviewers to minimize the chance of a manuscript failing to meet the printing deadline;

2) OHP recommend that ODP find a mechanism for printing late manuscripts (e.g. in a once-a-year supplementary volume);

3) OHP do not at present wish to recommend changing the present target timing for Scientific Results volumes but are extremely concerned about reports that acceptance or rejection of late manuscripts has appeared to be arbitrary; within the inevitable "grey" period (between target deadline and absolute deadline) such decisions must be made in consultation with the Editorial Board.

Annual Panel Chairpersons meeting (Shackleton).

It was agreed that synthesis chapters that failed to meet the Scientific Results deadlines ought to be published in the open literature; though it is regrettable to go without such chapters it is also the case that their appearance in the open literature is to be welcomed.

The question was raised as to whether sampling restrictions are being affected by the accelerating publication schedule. In discussion, Leg 130 scientists reported that restrictions had not impeded the sampling needed to achieve the cruise objectives; OHP should remember to ensure that sampling requirements are included in the cruise prospectus for similar future legs. However, the arbitrary removal of 30 cm long sections of core for possible future organic geochemical studies again proved an aggravating impediment to the scientific objectives.

It was reported that there may be a new policy of shipping core to land after every leg, which will accelerate the availability of material for detailed post-cruise sampling by shipboard scientists. (This is an example of a situation which arose more than once, where the information was not available. Within the panel, only the chairman would know that this had been proposed--it is in the PCOM minutes, with a $60,000 price tag--but it was not clear whether this had been agreed and if so, how one would know.)

Continuing the report, Shackleton mentioned that the difficulty of dealing with Sea Level as a scientific theme under the responsibility of more than one panel was discussed. It was agreed that so long as thematic panel chairs are aware of the problem, the theme should receive appropriate treatment. The review process was discussed; the consensus was that it was working well and fairly. It was agreed that drilling proposals should be available to interested scientists in the interest of optimizing the quality of proposals without maximizing the number. In discussion of this point OHP agreed that in view of the immense amount of work, involving many people, that intervenes between a proposal and the final targets in a drilling leg, an individual proponent should not feel proprietary about his/her proposal or the resulting drilling leg. D'Ozouville reported that JOIDES Office does make proposals available (aside from proprietary information contained in some).

PCOM report (Brass).

In his IHP report to PCOM, Moore reported that the CD-ROM containing DSDP data is available. It only contains shipboard data. IHP seeks the advice of thematic panels as to what information should be included in a future CD-ROM. In discussion OHP agreed that all tabulated data should be included in a future CD-ROM. It emerged that only one member had used the current system and OHP were surprised that visiting the JOIDES Office did not automatically provide the

opportunity to see it. OHP also recommend that since scientists are encouraged to submit manuscripts (and data tables) on computer disc, the data contained should automatically be stored electronically and should be available from TAMU until such time as it is published on CD-ROM.

In accordance with the intention reported by Moberly at the last OHP meeting, PCOM scheduled legs up to 139 ending Nov 29, 1991 (see above, TAMU report, and JOIDES JOURNAL). These may be regarded as more or less definite. For planning purposes PCOM tentatively scheduled five legs through 1992: 2 legs at the Chile Triple Junction; East Pacific Rise Bare Rock Drilling 1; Cascadia Accretionary Prism 1; and Hydrothermal Processes at Sedimented Ridges 2. Shackleton pointed out that this was not in accordance with the procedure outlined by Moberly at out last meeting and that if it is adhered to, this will make a nonsense of the prioritization process initiated at the Spring 1989 PCOM meeting. After that meeting thematic panels were asked to prioritize among a list of six programs (several of more than one leg, and only one of OHP interest) for the 1991 program; the present tentative schedule simply fills 1992 with the remaining lower-ranked programs in the list. Brass affirmed that this 1992 schedule is indeed tentative.

Other Items to Report

A JOI-USAAC workshop on the Paleogene will be held later this year; contact persons are Lowell Stott (Santa Barbara) and Jim Zachos (Michigan). An ODP workshop on Progress and Opportunities in Geochemistry was held at Lake Arrowhead, California Jan. 9-12 1990. A report will be issued by JOI-USSAC in due course (information: G.Brass). The following reports were presented to PCOM at the Annual Meeting and are available from TAMU: Summary Statement SS0300 on Unconsolidated formation recovery; A description of the Breakaway Piston Head (which was tested on Leg 130). A description of the Vibra-Percussive Corer. A report on phase II of the Diamond Coring System development (for coring to 4500 meters). An NSF Bimonthly report on Development engineering gives information on the various systems that are being developed in the interval December 1989 - January 1990. A workshop on Antarctic Offshore Cenozoic Stratigraphy will be convened by Dr. Alan K. Cooper (USGS, 345 Middlefield Road, Menlo Park Calif 94025) and Dr. Peter Webb (Ohio State U.) from June 7-10 1990.

Shackleton reported on the NEREIS project workshop held recently. This is a proposal for a European funded light dynamically positioned vessel able to recover sediment, perform limited rock drilling, perform down-hole experiments, perform biological experiments on the sea floor. The workshop discussed scientific opportunities and technical requirements. A report will be available within weeks (contact B. Biju-Duval, IFREMER Paris). It is not yet known whether there will be widespread support for this venture. In discussion Saito reported that Japan plans to build a large drilling vessel that may be available for scientific work for about 25% of the time. Neither of these possible developments have any bearing on planning for the next few years.

Shackleton reported on the Past Global Change component of the IGBP. At present a focus on (a) the past 2000 years and (b) the past 300,000 or so years is anticipated so that there will not be enormous scope for ODP involvement. A. Mix, W. Berger, E. Jansen, M. Delaney, T. Moore and N. Shackleton were suggested as suitable persons to act as liaisons to IGBP; Shackleton is at present a member of the IGBP Past Global Change Working Group. T. Bralower has been appointed Co-chair of the liaison group with Global Sedimentary Geology Program.

Mix reported that he had received a copy of a letter to OHP chairman (not yet received by NJS) from John Barron proposing that sites of opportunity could be chosen in the Santa Barbara Basin to be cored during the transit between legs 137 and 138. It was agreed that he should be told that a proposal would be essential, but he should also appreciate that such a proposal would have to be judged in competition for time with the other objectives of the leg that contains the transit. ACTION NJS, MIX: contact Barron

Berger reported on the very successful completion of all the drilling objectives of leg 130 (Ontong Java). High resolution shipboard records of magnetic susceptibility and of physical properties imply that post cruise work will generate outstanding contributions to our understanding of the evolution of high-frequency oceanic variability. Delaney reported that a geochemical investigation of the cause of the disappointing magnetostratigraphy on the leg may enable us to predict the likelihood of achieving useful magnetostratigraphy.

Proposal Reviews. In brackets: panel member watchdogs

350/E Gorda Ridge (Mix, Delaney). The objectives of the proposal are chiefly tectonic. The part that is of OHP interest is best judged as a component of the California Current study (proposal 271/E) and Mix reported that the proponents of 350/E and 371/E are in contact.

351/C Bransfield Strait (Mix, Jansen) does have significant OHP interest although the proposal does not either do a good job of showing what the sites will contribute to OHP interests, or discuss possible limitations such as turbidites.

352/E Layer 3. No OHP interest.

353/C Antarctic Peninsula (Jansen, Davies) does have significant OHP interest. OHP found the basic scientific questions not sufficiently clearly expressed. Dating problems are not adequately addressed, and the available piston cores in the area should be presented so that the feasibility of the approach can be demonstrated.

354/A Angola/Namibia (Stein, Berger) does have significant OHP interest, preliminary proposal. Some integration with 339 would be desirable in view of the overlapping and complimentary objectives.

355/E Gas hydrate (Loutit, Mix) no OHP interest but geographical area may be.

356/A Denmark Strait (Jansen, Berggren) the questions of OHP interest are also addressed in proposals 320/A and 336/A, which are better focussed.

357/E Axial drilling EPR: no OHP interest.

358/A volcanic rifted passive margins: Voring Margin (Jansen, Berggren) questions of OHP interest are no longer at the survey stage and require carefully focussed drilling such as is proposed in 320/A and 336/A

359/A replaced by 365/A.

361/A TAG area: no OHP interest.

362/E Chile Triple Junction (Mix, Davies): no OHP interest. Mix will investigate the question of whether the sediment to be recovered will be of sufficient value that OHP should recommend APC ACTION MIX.

363/A Plume volcanism: no OHP interest.

364/A Thrust units, Mediterranean (Vincent, Loutit): some OHP interest since Mediterranean sediments will be recovered, but not enough to justify ranking it.

365/A Conjugate Passive Margins N Atlantic (Bralower, Loutit). This is a multi-leg proposal. Undoubtedly some valuable data relating to early Atlantic ocean history and sea level will emerge but these are not of high priority themes within the proposal. OHP consider that although a large proposal may provide a useful overview, for reviewing purposes it would be easier to handle if it were presented in smaller segments.

It was clear that not only did the multi-objective proposal 203/E offer most to the OHP theme of Mesozoic ocean history but that it was the highest-ranked proposal in that theme. The considerable importance of the sequences to be recovered in the pelagic caps for Cenozoic studies, and the contribution to sea-level studies, are an added bonus.

366/A: letter of intent only.

367 Cool water carbonate margin, S Australia (Loutit, Davies). Although the proposal has OHP interests, it is to weak in its present form to be ranked. Davies will contact proponent to advise him on behalf of OHP.

368/E Old Pacific crust: no OHP interest.

369/A Deep Mantle Section MARK area: no OHP interest.

370/A Magmatic processes: no OHP interest.

371/E Nova Canton Trough: no OHP interest.

372/A Cenozoic evolution of N Atlantic deep water (Mix, Delaney). This addresses an important question of OHP interest: the relative contributions of Mediterranean and N. Atlantic intermediate depth water masses to the North Atlantic Deep Water. The proposal only contains 2 sites but after discussion OHP concluded that it would be useful to have a broader proposal that addresses the question of ocean Intermediate Waters on a global basis. This would enable OHP to be more systematic in inserting drill sites to tackle the question.

373/E Revisiting DSDP 505 (Shackleton, Mix). Not primarily OHP but the possible value of the sediment sequence is mentioned. This information is probably based on a statement made before DSDP 504 was re-cored as Site 677 and the need for double-APC coring at Site 505 is now much reduced. However since 677 was only partially double-cored, leading to gaps in the sequence below 100 mbsf, OHP would probably support APC-coring if this proposal is accepted.

374/A Oceanographer FZ: no OHP interest;

375/E deep crustal drilling, Hess Deep: no OHP interest

376/A Layer 2- Layer 3 boundary, Vema FZ: no OHP interest.

377/F Rev Seismometer test site, Oahu: no OHP interest.

378/A Barbados accretionary wedge: no OHP interest.

379/A Mediterranean continental collision: no OHP interest.

380/A Rev clastic apron Gran Canaria: no OHP interest.

381/A Argentine Slope (Bralower, Stein). Many objectives of OHP interest. The proposal is too immature to be ranked at present. It seems likely that the proponent of 327/A for the same region (Hinz) could provide data that would help the proponent of 381/A to bring the proposal to a more mature state. Stein will put the two proponents in touch ACTION STEIN.

Ranking

OHP then discussed procedures for attaining the overall ranking that PCOM needs for planning purposes. It was decided that each proposal would be categorized according to which of the major scientific themes outlined in the (S)OHP White Paper it addresses. For most proposals this is clear; for some, discussion was necessary to ensure that the proposal would reflect the Panel's overall view:

The Bering Sea contains a component that is very important for the Mesozoic ocean history theme, but it was clear that because of the high risk involved OHP would only rate the Bering Sea highly if the Neogene objective were considered at the same time; for this reason the Bering Sea was categorized separately.

It was clear that not only did the multi-objective proposal 203/E offer most to the theme of Mesozoic ocean history but that it was the highest-ranked proposal in that theme; thus the considerable importance of the sequences to be recovered in the pelagic caps for Cenozoic studies, and the contribution to sea-level studies, are an added bonus.

The categorization of proposal 335/E led to more extensive discussion but it was generally agreed that the proposal offers several different avenues to the understanding of global Sea Level (timing, magnitude, causes) and that it would best be judged in that theme.

Proposal 271/E addresses questions in Neogene ocean history as well the operation and history of high productivity areas. Since it proved to be the only proposal for that area judged sufficiently mature to be ranked it was placed in that category, ensuring that OHP gave it a fair ranking.

After proposals 338/E, 337/E and 367/E had been discussed again it was decided that for ranking purposes they should be grouped together as a single yet-to-be-finalized South-West Pacific Sea Level program. The categorization of other proposals was straightforward.

A number of proposals were judged to be too immature to rank at this stage. PCOM should be kept aware of those areas in which we expect to have proposals suitable for serious ranking by the time of the OHP meeting in spring 1991.

It was agreed that a member would not vote when his/her own proposal was being ranked.

In the final ranking within themes the High-Frequency ocean history (Neogene) proposals were ranked:

1 - High North Atlantic (320, 336);
2 - North Pacific Neogene;
3 - S. Equatorial Atlantic (347/A);
4 - Mediterranean gateways (323/A, 372/A).

The Mesozoic ocean history were ranked:

1 - Guyots (203/E Rev);
2 - Shatsky Rise.

The Sea Level were ranked:

1 - New Jersey margin (348/A);
2 - Atolls (335/E Rev);
3 - SW Pacific (337/E,338/E,367/E);
4 - Florida margin (345/A).

348/A was ranked 1 by a substantial margin; the 2nd and 3rd very close and indeed the order was reversed until Moberly objected that P. Davies had voted despite being a co-proponent of one of the three SW Pacific proposals. These two programs were discussed again and a new vote taken in which members were invited to abstain if they wished, in order to reduce the chance of a tie among the 14 qualified voters.

OHP then voted 12 times, each vote culling a program from the top of one of the five lists ("Neogene", "Mesozoic", "Sea level", "Productivity", "other" (Bering Sea). OHP consider that the final list is a good representation of their ranking taking account the chance of success and state of readiness as well as scientific importance:

1 - Northernmost Atlantic Paleoceanography; proposals 320/A, 336/A, 305/A;
2 - North Pacific Neogene: the package created by CEPAC at the request of SOHP/OHP from proposals 259/E, 247/E etc;
3 - New Jersey (sea level) proposal 349/A;
4 - Guyots; proposal 203/E;
5 - Bering Sea; CEPAC prospectus from proposals 182/E, 195/E;
6 - Atolls; proposal 335/E;
7 - South equatorial Atlantic; proposal 347/A;
8 - California Current; proposal 271/E;
9 - Southwest Pacific (sea level) from proposals 337/E and/or 338/E and/or 367/E;
10 - Shatsky Rise; CEPAC prospectus from proposal 253/E;
11 - Mediterranean gateways; proposals 323/A and 372/A;
12 - West Florida margin (sea level) proposal 345/A.

Of the Pacific programs the first 4 are mature and ready in the CEPAC prospectus. Of the Atlantic programs the first is ready and site survey for the second will be carried out in May 1990.

Panel Membership

Moberly explained that Droxler and Mayer had been recalled for this meeting because for several reasons PCOM had decided it would be inappropriate to replace them at this meeting concerned heavily with prioritization (while writing the minutes Shackleton inserts the suggestion that if this cycle of panel business is to be stabilized it might be better in general to have new members at the autumn meeting rather than at the spring meeting). He requested suggestions (at least two names) for a possible replacement. After discussion the following names were proposed: S. Schlanger (suggested last time, still considered appropriate); R. Halley (new blood; received strong support; A. Hine (new blood). W. Schlager's name also received strong support, but it was realized that he would have to be proposed as member-at-large since he is

based in Amsterdam. Droxler will enquire if Halley and Hine are prepared to serve and if so obtain a short CV for each. ACTION DROXLER.

Shackleton reported that in a letter apologizing for his inability to attend this meeting as well as the last, Eric Barron suggested that it might be appropriate for him to resign. OHP regretfully agreed that this might be sensible. It was noted that this would reduce our Mesozoic expertise; that the impending replacement of Saito by H. Okada (nannofossils, primarily Neogene) would further reduce our strength in that area and that when R. Stein rotates off there will be even further reduction. Judith Parish (U. Arizona) and L. Pratt (Indiana) were proposed as suitable replacements for Barron with expertise in modelling and in the Mesozoic. Moberly already has necessary information but must establish whether Pratt is prepared to serve.

OHP reiterated the need for an expert in siliceous microfossils and in high latitude paleoceanography. Four names were proposed: J. Barron (USGS) R. Dunbar (Rice) D. Lazarus (recently Woods Hole but now Zurich; not clear whether he would need to be a member-at-large) L. Burckle (Lamont; counter to PCOM policy while Kent (LDGO) is on OHP. The lack of Paleogene expertise highlighted at the last meeting would be alleviated by John Barron in the above list. OHP has also suggested K. Miller (Rutgers/Lamont) for expertise in the Paleogene and in Sea Level, but if Halley is chosen from the first list above then the need for sea level expertise will probably be satisfied. Shackleton's post-meeting summary (best solution): to replace Droxler and Eric Barron (and member-at-large Mayer), add: Halley (shallow carbonates, sea level), Parrish (Mesozoic, modelling), John Barron (High latitude paleoceanography, siliceous microfossils, Paleogene). Allow OHP one additional member for one meeting, revert to proper number at 1991 rotation, perhaps keep the other member due to rotate off for the spring meeting if PCOM agrees that autumn is a better time for new members to start work.

SGPP report: Delaney (OHP liaison)

Delaney reported briefly on the last SGPP meeting and outlined their priorities. The question of radioactive and/or stable isotope tracers was brought up. Delaney reported that the experiments performed on shore during leg 128 (check) had been very exciting in demonstrating bacterial activity at much greater depths in sediment than had previously been anticipated; this could well lead to requests for facilities to carry out analogous experiments aboard ship. OHP consider that established procedures are such that it should be possible to arrange for radioisotopes to be used. However the use of stable isotope tracers should NOT be permitted; the results of a leakage could be disastrous and neither adequate detection nor cleanup procedures are established.

LITHP report:

G. Smith reported briefly on the last meeting, showing how they had prioritized future activities.

Liaisons

Delaney is probably unable to attend as liaison at the next SGPP meeting (Paris 2-3 November). It may prove difficult to provide a liaison, but we do expect J. McKenzie (SGPP) to be able to attend the next OHP meeting. Loutit is OHP liaison to TECP; there was no volunteer as a liaison to LITHP. G. Smith was thanked for his contributions as LITHP liaison to OHP.

Other business

Loutit suggested that in future it would be appropriate for OHP to review the thematic objectives in the White Paper briefly before each reviewing and prioritization exercise. This will both help new members become acquainted with the panel, ensure that the panel members have ample opportunities to judge whether the White Paper needs revising or re-thinking, and sharpen our evaluations. ACTION SHACKLETON.

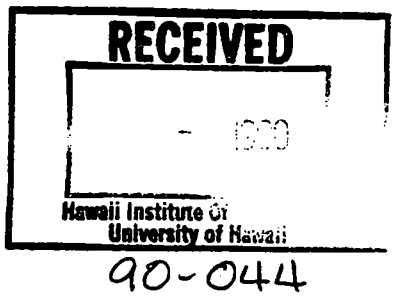
Loutit also suggested that the relationship between watchdog reports and proposal reviews for proponents needs clarifying. This will be an agenda item at the next meeting; meanwhile 1) Shackleton expressed appreciation to the JOIDES Office for their initiative in providing abstracts of proposals since this takes a burden off watchdogs; 2) OHP affirmed that they would like reviews to be included in the minutes.

Shackleton thanked retiring members Mayer, Droxler and Saito for their services on SOHP and OHP; thanked Peggy Delaney for her help in preparing the minutes; and thanked the JOIDES Office for hosting the meeting. The meeting ended at 12:30 p.m. on March 31st.

Next meeting: proposed Canberra, October 19-21 (i.e. over the weekend) hosted by P. Davies

The University of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

January 26, 1990



90-044

Dr. Ralph Moberly, PCOM Chairman
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, HI 96822

Dear Ralph:

This to verify our phone conversation yesterday regarding our mutual decision to core ahead into basement at ODP 801C at the expense of logging and a packer experiment. Yves Lancelot and I recommended this strategy based on the following circumstances.

Our prime consideration was not to junk 801C because we believe it will stand as a potential long-term reference/reentry site if we left the hole clean after Leg 129. Our logging cable had a splice in the middle of it, and the Schlumberger logging engineer strongly recommended against using this cable for fear of cable breakage. Therefore, we recommended not to log for fear of junking the hole. Even without this danger we considered the results from logging to be marginal compared to continued coring at the end of our first bit run. We had a total of 81 m of open hole below the casing shoe that is cemented into basement. The logging strings themselves are a significant fraction of this length (~20 m) and you never get back to TD with them. Assuming that we could have gotten to within 15 m of TD, that means we would have a total of 46 m of open hole for logging above the log top. This is **not** a big logging run in anybody's book. The potential return from those logs/packer had to be weighed against additional core recovery for the following purposes.

1. First order lithologic variations in basement. Our basement section was by no means solid basalt down to that point. Several significant sediment layers were included in the upper section and a remarkable hydrothermal deposit of chrome-yellow, silicified, hydrothermal precipitates had just been penetrated that had associated with it **huge** variations in the alterations of adjacent basalts. Were there more of these to come deeper in the section?

2. Paleomagnetic measurements. A first-order, but tentative tectonic conclusion onboard the drillship was that Site 801C was formed north of the equator in the Jurassic, crossed into the southern hemisphere at the J/K boundary and recrossed it again going north in the Campanian. This was based mainly on results from very minimal recovery in the overlying Jurassic sediments. We considered the basalts to be our best shot at the original paleolatitude of the site if we could get enough cooling units to average out the secular variation.

3. Radiometric age of basement. The basalt alteration at 801C was more extreme than at the other two sites in the upper section, apparently due to the hydrothermal activity. We needed to get below this to recover fresh enough material to radiometrically date basement, and also the Callovian Stage of the Jurassic, the most poorly calibrated part of geological time in the past 200 my.

We believed that the circumstances and the science for coring ahead into basement far outweighed logging/packer measurements at the end of our first bit run. We still believe that to be true. We would now like to formulate a new proposal to reenter Site 801C on a future leg and completely exploit its potential as a deep reentry/logging site. Such a campaign would include deepening 801C several hundred meters into basement followed by logging/packing/seismic and whatever other geophysical experiments could be dreamed up for a deep hole into the world's oldest oceanic crust.

Sincerely yours,

Roger L. Larson
Professor of Marine Geophysics

RLL:cs

cc: Yves Lancelot

February 23, 1990

Dr. Paul Worthington
Exploration & Production Division
BP Research Centre
Chertsey-Road, Sunbury-on-Thames
Middlesex TW16 7LN
U.K.

Dear Paul:

Thanks for sending the minutes of your recent DMP meeting so promptly. I'll respond to the items in your cover letter.

1. We can't all be everywhere all of the time. As you yourself had been at the preceding PCOM meeting, I hope there was no serious difficulty in lack of liaison.

   PCOM did discuss shipboard computers and high-temperature slimhole tools. There are some specific proposals that the Budget Committee will evaluate in relation to the various other TAMU and LDGO requests.

2. We will list the 28-29 June (Seattle) and an October (Australia) meetings on the Drilling Bulletin Board. About two months in advance of each one, I will write the formal letter of approval. Brisbane had been discussed; there should be no problems unless the ship schedule changes drastically.

3. Regarding lack of logging of Hole 801C on Leg 129, place your blame on me, not the co-chiefs. I heard a report that: (1) the Schlumberger engineer had recommended against logging, with the spliced cable, (2) there was insufficient basement recovered for age and paleomagnetic determination (one of the two main reasons for the leg), and (3) the PCOM interest in getting a sufficiently large sample of crust at some one site to be able to estimate how worthwhile so-called geochemical reference holes would be in that region. Other

but less important reasons were (4) that there could be no formative microscanner and no wireline heave compensation for logging of 70 m of possible basement, and (5) the co-chiefs did not want to leave junk (parted logging cable and tool) in the hole.

4. Thanks.

With best wishes,

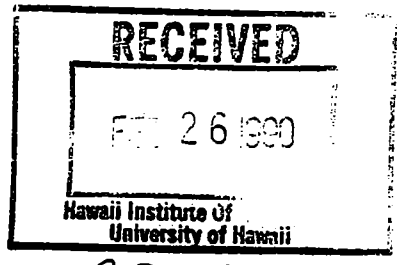
Sincerely yours,

Ralph Moberly
PCOM Chairman

The University of Rhode Island Graduate School of Oceanography
Narragansett Bay Campus, Narragansett, RI 02882-1197

Copy to DMP Members
T. Pyle

February 20, 1990



90-100

Prof. Ralph Moberly, PCOM Chairman
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, HI 96822

Dear Ralph:

Although we have previously discussed and corresponded regarding the decision not to attempt logging at 801C, pages 13 and 14 of the draft minutes from the DMP meeting on 23-24 January 1990 prompted me to write again in specific response to these minutes. I would ask that you pass this letter, or your own paraphrased version of it, on to the entire DMP membership, because I do not believe that their draft minutes are a correct or complete representation of our actions at 801C.

Their minutes are incomplete because there is no stated reason for the decision not to log at 801C, leaving the reader with the suspicion that the co-chiefs were biased against the logging program, which was not the case. Primarily, we did not attempt logging at 801C because we had a splice in the middle of our logging cable. The Schlumberger engineer on Leg 129 strongly recommended against logging in that situation for fear that the cable would break at the splice and the hole would be junked. A telex from Lamont said that the risk of this happening was small enough to be acceptable and closed with, "Final decision on whether to log is up to the co-chiefs; blame if we are wrong is ours." Having just cased the only hole ever drilled into Jurassic ocean crust in the Pacific, we felt we had an invaluable scientific resource to protect. Therefore, we chose not to log and you concurred with that decision. I still believe that decision was correct even though it deprived **my** graduate student, who was 129's JOIDES logger, of a valuable potential data set. The DMP draft minutes state that "the option to log was available but was not discussed." This is incorrect. This option was discussed not only with the Schlumberger engineer, but the ODP Operations Superintendent, ODP Special Tools Engineer, SEDCO Drilling Superintendent, ODP Staff Scientist (Dr. Andy Fisher who was present at the DMP meeting), the Lamont Logger and the JOIDES Logger. I believe that we **all** concurred with the decision not to log because the cable was spliced, and you subsequently agreed for the same reason. Instead of the paragraph in the DMP draft minutes that proports to describe these events, I would suggest the following:

"Hole 801C was cased into basement after Hole 801B had penetrated Jurassic ocean crust for the first time in scientific ocean drilling. This outcome partly satisfied the objectives of the defunct geochemical reference proposal. Although planned for downhole measurements, logging was not attempted here because it was feared that the logging cable would break at a splice in the middle of the cable and the hole would be junked. A packer measurement was not made because it was judged less scientifically valuable than additional penetration into basement to obtain (1) first order lithologic variations in basement, (2) more cooling units for paleomagnetic measurements, (3) fresher material for radiometric dating of basement. The PCOM chairman was aware of these decisions and concurred with them. The deletion of this program has meant that the downhole-measurement objectives of Leg 129 were not fully met."

I do agree with a statement in the next paragraph of the DMP draft minutes that "at this time of renewal negotiations it is imperative that ODP should be seen to be professional on all fronts, including planning." However, I believe that the example of unprofessionalism here is the incomplete, incorrect, and downright inflamatory nature of DMP's draft minutes. I suspect that if and when DMP knows the whole truth of this situation, most of them will agree with me. I certainly agree with DMP that logging 801C is extremely important as expressed in their recommendation 90/1, and also agree that decision making should not be in the parochial context of a single leg, but rather in the global context of an international scientific program. However, from the tone of their minutes I would not expect them to believe me. As testimony that this is not mere rhetoric on my part, they will soon be aware that I have coordinated JOIDES proposal 368E entitled "Jurassic Pacific crust: A return to Hole 801C," probably received by your office just before you got the DMP draft minutes. In it we proposed to deepen this hole to 1000 m in basement, and then to conduct logging, packer, and oblique seismic experiments. This proposal seeks to establish 801C as a reference site into ocean crust that can be compared with DSDP Holes 395A, 504B, and 418A as type localities of old and young ocean crust created at fast and slow spreading rates. I presume this is the type of global context DMP has in mind. We seek the endorsement of DMP, LITHP, TECP, and PCOM for this proposal.

Sincerely yours,

Roger L. Larson
Professor of Marine Geophysics

RLL:cs
cc/Andy Fisher, TAMU/ODP
Yves Lancelot, Univ. Paris

March 5, 1990

Dr. Warren Prell
Department of Geological Sciences
Brown University
324 Brook Street
Providence, RI 02912-1846
Fax Number: (401) 863-2058

Dear Warren:

As you know, the 1 February deadline has come and gone. You were requested, per Janalisa Soltis's letter of 13 February, to contact me with a new deadline proposal; however, as of this date, I have not heard from you and my phone messages have not been returned.

Below is the current status of Volume 1170 papers:

Expected Manuscripts - 2 Synthesis Papers
Rejected Manuscripts - 1
Manuscripts in Review - 1 Synthesis Paper
Manuscripts in Revision - 26
Manuscripts Pending Acceptance/Rejection - 3
Accepted Manuscripts - 9

You will note that all but 12 manuscripts are in danger of exclusion from the volume.

The time has come to focus on those individuals who we are confident will submit soon even if this results in a small volume. Therefore, as of this date, no manuscript revisions will be accepted at ODP later than 15 March 1990. We will forward telexes to all correspondence authors of outstanding papers informing them of this decision. Our production schedule can no longer accommodate postponement of the deadlines.

If you have any questions regarding this decision, please contact me at (409) 845-~~9234~~. 9324

Very truly yours,

R B Merrill

Russell B. Merrill
Manager of Science Services

Enclosure

Ocean Drilling Program
Publications
Texas A&M University Research Park
1000 Discovery Drive
College Station, Texas 77840 USA
(409) 845-8483

BROWN UNIVERSITY *Providence, Rhode Island • 02912*

DEPARTMENT OF GEOLOGICAL SCIENCES
Box 1846
401 863-3221, 3338, 3339

90-127

March 9, 1990

Russell B. Merrill
Manager of Science Services
Ocean Drilling Program
Publications
Texas A & M University Research Park
1000 Discovery Drive
College Station, TX 77840

Dear Merrill:

I strongly object to your fax that decrees the Leg 117 Scientific Results volume will be closed as of March 15 with a possibility of only 12 of approximately 40 papers to be included. This decision is simply sacrificing quality for schedule. Quality may be upmost in the mind of the editors but certainly quality and comprehensive studies are the aim of the program and the scientists that participate in it. Actions such as this do more to discredit ODP than anything else I can think of.

I realize that JOI panels and other reviews have put pressure on you to publish rapidly. However I don't believe that any of the scientific participants in ODP would be happy about cutting off important manuscripts and producing an inferior volume. I don't know what the exact date should be to cut off manuscripts, but I am absolutely certain that this present decision will lead to an inferior volume with many disappointed scientists.

You must realize that the shipboard scientists are competent professionals that are working in good faith to complete ODP objectives along with their many other professional, teaching, research, and administrative duties. They should be treated as professionals and not constantly sent threats about deadlines and the loss of future samples. Consider that:

* The review process has taken considerably longer than we anticipated.

* Many of the manuscripts required major revisions - especially the foreign manuscripts. For example, I am still in the process of editing and trying to provide useful guidance to Niitsuma, VanCampo, and Sulaimani. All these revisions and extensive rewritings take a considerable amount of time.

* Only one of the four synthesis chapters are in the review process.

* A number of us have been working on the planning and logistics, the participation in the cruise, and the research efforts since 1985. We have tried to build a comprehensive program that covers a wide variety of areas and had been successful in doing so. We do not believe that 5 years of effort should be truncated for a few months of publication schedule. The work and studies in this volume are just too good to be fragmented so that the Leg will lose its impact on the community.

* Most importantly, the scientists of Leg 117 are working conscientiously in good faith to produce the best manuscripts possible on a very complicated subject. I simply cannot justify cutting them off at this time. I see no benefit to ODP or to the scientific community and the scientists of the Leg to prematurely publish an inferior volume. The understanding of the sediment and biological response to upwelling and its changing environment has turned out to be a very complicated subject. One that requires the intercomparison of a variety of types of data and locations. These studies are generally in separate chapters that must be combined in the same volume. The idea of publishing some of these papers or the syntheses in later volumes is just ridiculous. Even if the Leg 117 volume is late and out of sequence, it must have key manuscripts and syntheses to be the important contribution which it deserves.

I urge you to reconsider this arbitrary cut off date of March 15 and to not send this message to the scientists of the Leg. I have already lost manuscripts due to the previous threats of cut offs. I do not know what the magic date should be but I do know that this proposed date to cut off manuscripts in revision and review is demoralizing to the scientists working on the manuscripts and is counterproductive. The goal of ODP is to produce top-notch science so that the community will value the scientific results volumes. We are dedicated to this goal and consider it more important than arbitrary publication schedules. If need be, we should get the editorial board together to review all of these manuscripts and revise the date. However in the interim, I specifically request that you do not send out this cut off date to the authors with manuscripts in review or revision.

Sincerely,

Warren

Warren L. Prell

cc: R. Moberly
B. Malfait
D. Heinrichs
N. Shackleton
P. Rabinowitz

(2) The system of awarding a large grant to deep-sea drilling had its start in 1968. The first few phase of drilling was approved on the basis of proposals sent by scientists from the so-called JOIDES Institutions, people such as Maurice Ewing, Cesare Emiliani, et al. The proposals went through peer review system. The JOIDES committees and panels have very specific goals of supplying site-survey data, of pin-pointing the drill sites for approved objectives, etc. After more than two decades, the same sets committees and panels are still there, but they have usurped priveleges far beyond the normal practice.

The present practice of Ocean-Drilling Program awards the JOIDES-ODP some 40 million dollars, among those some 25 million dollars were from US NSF. (This information was based upon my knowledge up till 1987/88, and could be slightly inaccurate). The proposal was the so-called COSOD (Conference on the Future of Scientific Ocean Drilling) report, which was reviewed by an academy panel. As one of the many authors of the COSOD report, I could point out that the document is not a research proposal with specific objectives, but an advisory documents delineating some broad areas of emphasis. Specific research projects are submitted by scientists to the JOIDES office.

Theoretically the opportunity is open to all. In fact, the JOIDES establishment has a blank check to do mediocre science. The JOIDES panels serve the function of (1) proponents, (2) referees, (3) panel judges, and (4) planners. Having served on various JOIDES panels for two decades, I am quite familiar with the workings of many panels.

Highlighted portion

The proposals are not judged on the basis of their scientific merit, potential scientific significance. They are judged on the basis if they are "**mature.**" The word immature has killed many good proposals, because good ideas seldom originate from projects where the available data are overwhelming. In fact, it is much worse. In the early days, funds were used for site-surveys if ideas were good. ODP Legs 72. 73, and 74 have turned out to be outstanding achievements, but those legs were drilled on the basis of very inadequate data; very immature proposals. The Leg 74 proposal, for example, was based upon one single-channel airgun profile. The proposal was accepted because Walvis Ridge provided a unique opportunity to study the variations in calcite-compensation-level. Two oceanographical cruises were sent to the region for seismic surveying prior to the drilling.

Nowadays, good ideas were rejected, because they would be labelled immature, if they do not have an abundance of multiple-channel seismic. Most panel members are those who have many profiles of multiple-channel seismic, otherwise they would not have been selected. They use this unfair practice to condemn all other proposals who do not have as much seismic data as those of their own.

To cite one example: A South African scientist submitted a drilling proposal to drill a suspected K/T crater in the Indian Ocean. He contacted me because I was a member of the influential JOIDES Planning Committee. Furthermore, I was delegated that year as a "watchdog" to oversee the planning of the Indian Ocean Drilling. His proposal was excellent, and his interpretation was accepted by his peers so that his manuscript was published in Geology. We all agreed that to find the K/T crater and to sample possible impact-debris in the crater would be one of the most exciting endeavors in ocean science. Furthermore, we would have an excellent record of the paleoceanography of the Indian Ocean, situated between the Tethys and the Pacific, even if we could not find a crater. I made a special effort to see the panel chairman and to discuss with him this exciting proposal. He turned down the proposal with the familiar phrase: "The proposal is not mature." Heck, the proposal has seismic, magnetics, and sediment data. Even if it is not mature, then site-surveying should be done to make the proposal mature. Instead, the Indian Ocean Panel wants to devote much of their effort in that part of the Indian Ocean to investigate a possible ridge jump during Anomaly 27 time. Now you are familiar with the geology of that part of the world: Would you rather find a crater which might be the source of the Deccan Trap, or would you be worried if some Magnetic

Lineation should be Anomaly 27 or 25? Anyway, the JOIDES Panel chose the "mature" projects, which are in most cases synonmous with mediocre projects, with plenty of seismic profiles, submitted by panel members or by their friends. In fact, as I learned from grapevine, the Indian Ocean Drilling was largely a disaster. There was one leg when the chief scientists of the cruise did not know what to do, and the expensive vessel drifted in the ocean while waiting for instructions from the shore.

To make the long story short, my proposal is that the JOIDES has to be drastically reformed. There is no reason why scientists from the JOIDES institutions should be previleged. There should be a Division on Ocean Drilling in the NSF. There should be a Scientific Panel on Ocean Drilling in the NSF. There should be a peer review system to evaluate proposals, submitted by scientists from all US institutions. There should be a de-emphasis that multi-channel seismic is a pre-requisite for an acceptable drilling proposal. The proposals should be selected on the same set of criteria as other NSF proposals. Finally, many scientists complained about the operating institution Texas A and M, and one should perhaps look into their operations.

Highlighted portion

" I would like to emphasize that the ocean-drilling effort has been one of the great endeavors of the earth-science researches. This endeavor is decaying." Unless a revolutionary reform is taken place, the overwhelming majority of the earth science community will not support the next proposal for ocean drilling. } Highlighted portion

As you know, western Europeans are working on a NEREIS project, but this vessel to be built will only penetrae 200 m subbottom. The European effort is, therefore, a complement, not a competition to the Ocean-Drilling Project. On the other hand, if no reform is quickly forthcoming, the American leadership in ocean drilling will be replaced by a French effort.

As a former American, foreign association of the US National Academy of Sciences, and as a scientist who spent the greatest part of his career in ocean drilling, I am writing this letter in an effort to save, not to kill, the ocean drilling project. I hope the NAS committee on NSF operations give much thought to this very important problem, which may greatly influence the future of oceanography and earth sciences in USA.

I am sending a copy of the first part of the letter to Prof. Froidevaux, and the second part of this letter to my friends in ODP and NSF, namely, Ralph Moberly (Chairman, JOIDES P Comm), Darrell Cowan (Member, JOIDES P Comm), Jim Hays, Bil Haq (Ocean Science, NSF), because they are sympathetic to my ideas, but they believe that the reform has to come from above.

With best regards,

Ken Hsü

Foreign Associate, NAS

NATIONAL ACADEMY OF SCIENCES

ROBERT G. COLEMAN
Geology Department
Stanford University
Stanford, California 94305

SECTION OF GEOLOGY
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Ralph Moberly
JOIDES
School of Ocean & Earth Science & Technology
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822

Dec. 4, 1989

Dear Ralph:

I enclose a highligted copy of a letter from Ken Hsu which by now you have read. Rather than give another opinion on this matter I have underlined the parts I think are important.

I am now envloved in a volume which is reviewing Earth Science and trying to set priorities for the future as part of the National Academy Sciences function as an advisory group. So far there is not much excitement for Deep Sea Drilling and that stems in part from the general perception that not much new or innovative will come from this program.

My suggestion is to not protect so much of oceanography but to let the individual scientists compete like th rest of us have to do for some of the money. I realize that there has to be some dedicated money for oceanographic institutions and that needs to be protected but not at the expense of producing hum-drum science by people who are not scrutinized by the Earth Science community.

I hope you will find these comments of use in learning what the Earth Science community perceives is happening in JOIDES.

Sincerely yours;

Robert G. Coleman

ETH Eidgenössische Technische Hochschule Zürich
Ecole polytechnique fédérale de Zurich
Politecnico federale di Zurigo
Swiss Federal Institute of Technology Zurich

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Joint Oceanographic Institutions
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Washington, D.C. 20036-2102
U.S.A.

March 13th 1990

Dear Mr. Pyle :

The letter on JOIDES was sent to Bob Coleman, Chairman of the Earth Science section of the National Academy of Sciences. If the whole letter was not sent to you, that is only because the other part concerns the nomination of a candidate for membership in NAS, which has to remain confidential.

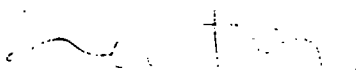
The letter to Bob summarizes oral discussions during a NAS meeting at the last GSA. The letter was written because of the advice of numerous former and active participants of ODP, including members of JOIDES P-Comm. who are concerned about the future of ODP after 1994. It is written to help the ODP, not to bury it. As you know, there is much concern among US scientists about a possible competition for ODP in the European NEREIS program. I could assure you that many of us in Europe would like to see both programs operative; the NEREIS, as you know, has no plans for deep penetration beyond 200 m subbottom and would be mainly a tool to study ocean-history.

My suggestion on ODP is far from being negative. What I suggested to Coleman, and to my JOIDES friends, who urged me to write this letter, was to make ODP a permanent part of the NSF program, and that research proposals sent to that program will have to be processed, like other NSF proposals. At the moment, the JOIDES panels are weighed heavily in favor of mediocre earth scientists who have little originality, but good equipment to produce multiple-channel seismic. The present indifference of earth scientists for the ODP can be traced to the fact that the program has been usurped by an inside group, who condemn all other proposals as "immature" because not enough multiple-seismic profiles are presented with research proposal. I have sat through enough panel meetings and some P-Comm. meetings to give numerous concrete examples. I know of at least two or three very exciting proposals (not by me, but by earth scientists with no establishment support) which were dismissed because of the unfair practice of the establishment tactic :' A proposal is never bad, only "immature". The mature proposals have so far produced nothing which has excited the imagination of the earth science community comparable to the discoveries during the DSDP days.

By the way, a preliminary version of the same idea to suggest reorganization of ODP was sent to the NSF Director, about a year ago. He wrote me that he had given the letter to proper persons to study my suggestions of reform. I have not heard from the NSF since. This is the reason why the last letter was not sent to NSF, but to the NAS, when Bob Coleman told me that it was part of NAS' duty to watch over the NSF operations.

With best regards,

Sincerely,



Kenneth J. Hsü
Foreign Associate,
US National Academy of Sciences

cc : Professor Bob Coleman
Professor Ralph Moberly

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4 April 1990

Dr. Robert G. Coleman
Geology Department
Stanford University
Stanford, California 94305

Dear Bob:

This late reply to your December 4 letter about Ken Hsü and JOIDES results partly from a bout with the flu in December, followed by information that you would be in Oman through the winter.

It is true that Ken Hsü buttonholed me twice for nearly an hour each time at the GSA in November. Ken is a very perceptive person, so that I always find his comments of interest. I agreed with many of the (oral) points he made, and disagreed with others. Ken mentions in a letter of which he (and you) sent me two pages that Darrell Cowan and I are sympathetic with his ideas, and Darrell and I talked about that. Again, I agree with some of the (written) points but not others. As for Darrell, you should ask him directly what he believes, because a statement from me about him would be just as much hearsay as for Ken to give the unknown recipient of the letter a statement of my opinion.

I regret that you do not see the excitement in recent ocean drilling efforts that is seen by the earth scientists I know. That seems to be a matter of where one's interest in science lies. Even in such areas of interest to me as tectonics and Mesozoic history where advances on land may be more important than advances by ocean drilling, I am pleased to see the major contributions that still come from drilling. I do believe that the main interests of the majority of the US and other scientists in JOIDES should be of strong general interest to most earth scientists of any persuasion and any nationality, namely the development of oceanic lithosphere, the climatic history of the past several million years, the geochemical changes during fluid migration, and tectonic processes at submerged plate boundaries, all of which can only be studied adequately by drilling.

Ken and you make two objections that seem to be mutually exclusive: lack of innovation and lack of scrutiny. I am not sure where

you receive what you term the general perception that not much that is new or innovative will come from the program. It is true that the general guides (COSOD reports, JOIDES Journal, White Papers, and other planning documents) are known to the general community well in advance of drilling, and so it is hard to label as "new" a proposal to attack some problem if it has been known for years that such an attack is pending. Further it is true that it is difficult to add a proposal to the drilling schedule at short notice, whether or not it is innovative. Besides logistical problems of having a vessel go to different places on short notice, in my opinion the difficulty of innovation is precisely because of the scrutiny that does exist, in the various advisory panels. The very fact that the program is expensive -- a successful proposal for a drilling leg is about $6M -- has led to intense scrutiny, and thereby to difficulty in adding new proposals without careful review.

[Incidentally, with respect to Ken's example about an innovative Indian Ocean proposal from a South African that was declined, I have looked through the 68 proposals for drilling in the Indian Ocean that were received by JOIDES, to try to find out what the proposed work was like, and what the objections were. I find one, by Jim Heirtzler, an American, that proposes drilling on Laxmi Ridge to learn more about the Deccan Traps, but none by a South African, and no mention of impact craters. Perhaps Ken could provide more information.]

I do not at all consider all to be sweetness and light. Many of the drilling-program problems date from the transition period from the last part of DSDP into the first part of ODP, when there were difficulties at NSF, at JOI, in the old and new Science Operators (Scripps and TAMU), and in the JOIDES planning and advisory structures. Some of the worst of these problems have been corrected, but some continue. My list has some overlap with Ken's, but includes other points as well. Like Ken, as he indicated in the unidentified letter to someone, and in his 13 March letter to Tom Pyle, I hope that my criticism and actions benefit the drilling program and indeed all of geology rather than detract from it.

As a final comment about your letter, I can only agree with Francis Bacon, Samuel Johnson, and Harry Hess that it is up to the young to propose and the old to dispose. You are trying to set priorities for the future. I hope that you in the NAS continue to receive innovative proposals from a broad range of young earth scientists, just as we are receiving in JOIDES.

Sincerely yours,

Ralph Moberly
PCOM Chairman

cc: Dr. K. Hsü
Dr. T. Pyle

19 January 1990
Onboard JOIDES Resolution

Professor Ralph Moberly
Chairman, JOIDES Planning Committee
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822

Dear Ralph:

We write to express our dismay and concern about an action of PCOM that puts TAMU's Operations Superintendent, instead of the Co-Chief Scientists, in charge of the "correct" execution of the science plan for ODP legs. We believe that this decision directly implies that the Co-Chiefs cannot be trusted to act in good faith to accomplish the approved scientific goals of the leg in the face of constantly changing operational situations and constantly increasing scientific knowledge as the leg progresses. Furthermore, it seriously hampers the flexibility and creativity that top level scientists gladly bring to their work. Finally, it breeds animosity between the Co-Chiefs and the TAMU Operations Superintendent and Staff Scientist that should not exist. Since we are just finishing the seagoing portion of our jobs as the Co-Chiefs of ODP Leg 129, we feel that we are in a good position to comment in some greater detail on the problems with this system. We would like to stress first that we do not have specific problems with the manners in which Mr. Glen Foss and Dr. Andy Fisher, TAMU's Leg 129 Operations Superintendent and Staff Scientist conducted themselves during Leg 129. They did their jobs as best they could, having been placed in a difficult situation that we now bring to your attention, and hope you will correct.

The ODP Operations Superintendent and Staff Scientist determine the "correct" execution of the leg's science plan by reading the Leg Scientific Prospectus, which automatically confers on this document a status it does not deserve, that of a legalistic cookbook not unlike a divorce agreement or a real estate contract. The Operations Superintendent is then faced with the job of trying to enforce a contract that he did not write by giving all of the Priority I items equal weight and hopefully, but not necessarily, working out a reasonable operations scheme with the Co-Chiefs.

But why is this a problem, a naive PCOM member might ask. The Co-Chiefs wrote the Prospectus; can't they stand by what they "promised" to do? The problem, of course, is that the prioritization scheme is much more complex than just first and second, and that this prioritization of objectives evolves daily, if not hourly, onboard the drillship as more data are acquired, more thought is put into the project from the entire Scientific Party, and operational considerations make certain goals more costly or unlikely than others. This is the essence of field-oriented scientific research.

And why is that a problem, replies the naive PCOM member again. If there is a disagreement or a proposed change in priorities, the Co-Chiefs/Operations Superintendent can always call the beach and ask for a ruling from the PCOM Chairman (assuming he can be located on short notice). As one of us (RLL) knows from 2 years of personal experience, this puts the PCOM Chairman in a decision-making position where he almost certainly knows **less** than the Co-

Chiefs on the drillship wh[illegible]ave been living with the problem 24 hours/day. While he can usually get t[illegible]o speed on the straightforward operational problems, he cannot even hope to make a better scientific decision than the scientists who have been experiencing the situation, and who will continue to live with its solution as they analyze, interpret, and report on the data that results from it. If he **could** make a better scientific decision than the Co-Chiefs, then the Co-Chiefs should not be leading the expedition.

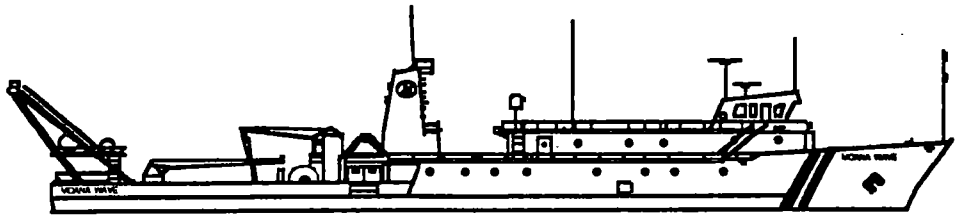
But how can we guarentee that the Co-Chiefs will abide by the overall mission of the leg that was originally proposed by the proponents and approved by PCOM, the naive PCOM member finally asks. The answer is simple, as one of us (YL) has pointed out to PCOM in the past. Appoint the proponents of the successful proposals as the Co-Chiefs of the leg, and abandon the notion of making sure that national priorities are always balanced so that EXCOM members will not complain that their MOU's are being violated.

This entire issue boils down to one of trust. Can the PCOM trust the Co-Chiefs to act in good faith to best accomplish the goals of the leg? If they cannot, then the wrong people have been chosen for the job. We believe that most of the past Co-Chiefs have proven to be both honest and capable leaders, especially since their decisions are open to public and direct review at the first PCOM meeting after the leg. If PCOM feels pressure from the Lamont Logging Contractor to require logging of all 400 meter holes via the TAMU Operations Superintendent, that is certainly reasonable, and within the capabilities of the Operations Superintendent to determine. All other scientific priority decisions onboard the drillship should be left to the Co-Chiefs. That's what you're paying us for.

Sincerely yours,

Roger L. Larson

Yves Lancelot



Roy H. Wilkens
Marine Geophysics Division * Hawaii Institute of Geophysics * University of Hawaii * Honolulu, Hawaii 96822
(808) 944 - 0404

April 3, 1990

90-185

Dr. Ralph Moberly
Hawaii Institute of Geophysics
University of Hawaii
Honolulu, HI 96822

Dear Ralph;

I've recently returned from Leg 130. I'd like to register a protest with the Planning Committee with regards to what I saw as a major change in drilling priorities that was implemented a week before the cruise and was unknown to many of the leg participants until we arrived in Guam and joined the ship. I'm referring to a directive that (paraphrased) stated that if 'we were 50m into basement with 6 days of drilling time left, we were to abandon the basement hole and return south for another transect site.' This in comparison to the second to last sentence in the Leg 130 Prospectus (Page 10), "Any time savings made up during the cruise from faster than expected transits, drilling rates, etc., will be applied to deepening OJP-5 to depths greater than 1400 mbsf."

The difference is clear; and non-trivial. From the Prospectus, the document published and distributed amongst the community, we are led to believe that we're taking a chance, but if all goes well we'll get a deep hole. The amendment means that if things go badly or very well, we have no deep hole. If they go 'sort of okay,' then we can drill further than 50m into basement, but in no case longer than 5 additional days.

The problem is twofold. First - I find it hard to believe that drilling proposals, which take three to five years to mature and seem to go through endless committees and panels and reviews, cannot be finalized sooner than the week before the Resolution sails. Second - Those people who contribute to the success of the drilling program through their participation as shipboard scientists must be able to know what to expect during a leg. I've always figured, at least once the Prospectus was out, that plans were solidified.

It is my personal and professional opinion that the Planning Committee, while perhaps operating within the strictest definition of its mandate, is guilty at least of poor taste in its treatment of the shipboard scientists and in its handling of the drilling plans. Surely, after years of debate and discussion, the panel should be able to agree on an agenda that will last the two months or so between publication of the Prospectus and the cruise. The "50m-6 day rule", as it came to be known on the ship, was a bad precedent to set and had the potential to bring about a rift in the scientific party. I hope that the members of the Planning Committee will think about the possible consequences of similar actions in the future.

Sincerely,

R Hwilkens

the back of me.

Dalhousie University

Centre for Marine Geology
Halifax, Nova Scotia
Canada B3H 3J5
(902) 424-6461
Telex: 019-21863

7 March 1990

90-146

Dr. Ralph Moberly
Chairman, JOIDES Planning Committee
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822
U.S.A.

Dear Ralph:

This is in response to your letter of 12 January requesting an evaluation of ODP accomplishments in light of COSOD I objectives. I can comment most effectively on basement objectives and so will limit my remarks to these.

It is surely a gross overstatement to say that Legs 106 and 109 proposed and achieved an understanding of hydrothermal systems in oceanic crust. Leg 106 contributed some information on a specific system but in no way dealt with distribution of alteration with time, and added only slightly to our knowledge regarding spatial relationships or association of hydrothermal activity and volcanism.

Likewise Leg 106 contributed little to our knowledge of mantle heterogeneity. Nor did 109 aid significantly in understanding structural complexity and mid-ocean ridges, evolution of the crust, and problems of magma chambers. I was under the impression that Leg 109 sampled mantle peridotite not layer 3 as indicated in the table.

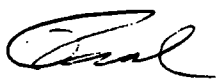
The other basement legs appear to be accurately represented although there are a number of erroneous perceptions associated with Leg 118 on which I was Co-Chief. This leg certainly contributed to our understanding of magma generation and crustal construction at MORS but yielded little regarding the petrology of transforms. Contrary to the table, Leg 118 contributed directly to problems of magma chambers (in fact, this is the only "fossil" magma chamber that has been drilled) and it certainly sampled the upper part of layer 3.

The other basement legs, 115, 119, 120, 121, 123, certainly contributed information on various aspects of the basement but in no case can we say that a specific problem has been "solved". I believe that this is due to the lack of thematic planning that

has plagued ODP from the beginning. With the exception of Legs 106 and 109, which represented an integrated effort to address a particular problem, ODP basement legs have been patchwork attempts to obtain small increments of information. Instead of sailing from ocean to ocean and asking what can we do here, we should ask where is the best place to study a particular problem. Once such an area has been identified, we should devote the time and effort necessary to resolve the problem or at least to show that it cannot be solved at that site.

This is not a new suggestion - it has been proposed many times in the past. However, until PCOM takes the lead, nothing with happen. In my opinion, we will never satisfactorily address the problems outlined at COSOD I and COSOD II until such an approach is taken.

Sincerely yours,



Paul T. Robinson

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December 19, 1989

Dr. R. Moberly,
Chairman, Ocean Drilling Planning Committee,
Hawaii Inst. of Geophysics,
Univ. of Hawaii,
2525 Correa Rd.,
Honolulu,
HI 96622,
U.S.A.

Dear Dr. Moberly,

Re: ODP Proposal 268/D: "Depositional and diagenetic environment of host rocks to stratabound lead-zinc deposits in carbonate rocks - a contribution to the ODP Queensland Plateau and Queensland Trough drilling project" - D.F. Sangster, L.F. Jansa, and J. Welhan.

The proponents of this proposal were recently contacted by Audrey Meyer concerning the sampling program for Leg 133. At the same time, we had our first opportunity to review the Final Prospectus for this leg. Upon examining this document, we were astonished and disappointed to learn that none of our proposals, outlined in our August 1987 revised submission, appeared in the prospectus.

The final approved sites described in the prospectus are obviously designed to meet SOHP's highest priority i.e. platform development and global sea level changes. The number, location, and target depths of the four sites described in our revised proposal constituted what we regarded as the absolute minimum requirements to meet our primary objectives. ODP's selection of sites and depths to meet its own objectives is not adequate to meet even our minimum requirements. We don't understand Planning Committee's decision to test, by drilling, the concept of a Cenozoic change in Australian plate position, a concept well established from paleomagnetic studies, rather than venture into an innovative study which would bring a large segment of the ecoonomic geology community into ODP.

From comments received during the several iterations of our proposal, it is apparent that the ODP program has difficulty in properly understanding, and therefore evaluating, scientific proposals in the general field of economic geology. Not unsurprisingly, not only do we feel a unique opportunity has been lost as a result of SOHP's decision, but a clear signal has been sent to economic geologists that there is little opportunity for them to participate in ODP activities.

Thus it is clear, after examining the Leg 133 Prospectus, that none of the objectives described in our revised proposal can be adequately met by the accepted

drilling sites and depths. Consequently, we hereby serve notice that we wish to withdraw our application to participate in Leg 133. Furthermore, to avoid confusion and misrepresentation, we ask that all reference to lead-zinc mineralization be deleted from future descriptions, etc. of Leg 133.

For us, the experience of the application procedure, although disappointing, has been interesting and informative. Although we were disappointed to realize how apparently little emphasis ODP places on scientific problems with an economic, rather than environmental, application, we nevertheless wish Leg 133 every success in meeting its objectives.

Sincerely,

D.F. Sangster

D.F. Sangster
L. Jansa,
J. Welhan

cc: A. Meyer
J. Malpas

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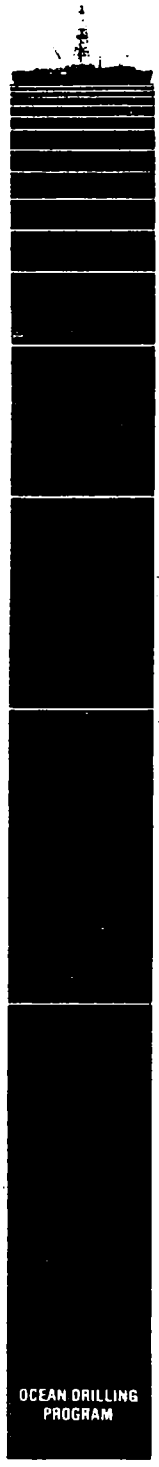

30 January 1990

Dr. D. F. Sangster
Energy, Mines and Resources Canada
Geological Survey of Canada Sector
601 Booth Street
Ottawa K1A 0E8
Canada

Dear Dr. Sangster:

Your letter dated December 19, 1989, about your ODP Proposal 268/D of August 1987 titled "Depositional and diagenetic environment of host rocks to stratabound lead-zinc deposits in carbonate rocks - a contribution to the ODP Queensland Plateau and Queensland Trough drilling project", by yourself, L.F. Jansa, and J. Welhan, was received here January 18, 1990. I apologize that I could not answer it immediately. You expressed your astonishment and disappointment that none of your proposals appeared in what you term a Final Prospectus for Leg 133.

I can understand your disappointment, but let me make a few points. First, less that 15 % of the ODP proposals that have entered the system so far are likely to have been drilled by the end of Leg 133 (now termed NE Australia). Competition is heavy. Second, whenever there have been attempts to combine multiple objectives into drilling legs, we must have some kind of advice on how to set priorities within legs. We use our advisory panels. Third, the composition of JOIDES advisory panels is diverse, and apparently many panel and committee members have interests that do not overlap yours. I will bring your letter to the attention of the Planning Committee, within the broad category of response to fields not conventionally covered by the geologists and geophysicists at oceanographic institutions, the pool from which we receive much of our panel membership. Economic geologists are not the only group of scientists who believe their field does not receive adequate attention.

As for your astonishment, I realize that you had not heard formally from this office that the NE Australian leg would contain little if anything that you had proposed, although I would have thought you heard informally. The JOIDES Office did not decide until the fall of 1988 that henceforth, verbatim copies of panel evaluation of proposals would be sent to proponents. We did not look back in the record and report earlier evaluations, so you were not sent the reviews and decisions in the fall of 1987 about your proposal. There were, however, Canadians at the 1987 and 1988 panel and PCOM meetings.

Furthermore, although it is hearsay to repeat it because I was not there and have seen no minutes, I was told that some time ago that the 1987 reviews and decisions about your proposal were discussed within the Canadian National Committee.

The report of the former Sediments and Ocean History Panel (SOHP) to the November-December 1987 Planning Committee (PCOM) meeting is given in detail in the PCOM minutes, and a 22-page, site-by-site prospectus was distributed. The minutes state that SOHP had discussed the proposal about Mississippi Valley-type deposits, and were specific that SOHP did not recommend adding extra sites for that proposal. PCOM accepted the recommendations of its SOHP and Western Pacific Regional Panel then for the Science Plan part of the Program Plan, and insisted on no more than a one-leg program.

There was no change in these plans at the April and August 1988 PCOM meetings or at the May EXCOM-ODP Council meeting.

In the November-December 1988 PCOM meeting, two sites were cut from the NE Australia drilling, to be able to fit within a single leg, and one leg was formally assigned for its drilling in (US) Fiscal Year 1990. That was to be Leg 132. PCOM approved eight sites at that meeting, which was slightly more than one year ago. Those sites are located to study the effects of control by sea level and climate on a mixed carbonate-detrital section of a subsiding and equatorward-drifting passive margin. It is true that the Science Plan still spoke of the Mississippi Valley-type environments and diagenesis, because if not all of the main sites can be drilled for reasons of safety, pollution prevention, or clearances, then it will be useful to have some alternate sites, for alternate objectives.

I have not seen what you call the Final Prospectus for the leg. I suspect that it is only a draft. Final ones are not normally prepared until after the safety panel has cleared enough sites, and are prepared by ODP-TAMU following the scientific objectives in the Program Plan, in conjunction with the Co-Chief Scientists. Presumably the prospectus will list the sites and objectives that are in the FY90 Program Plan. Incidentally, the Plan does not include a test, by drilling, of the concept of a Cenozoic change in Australian plate position. As you request, and on the assumption that the proposed 8 sites do pass the

safety panel, JOIDES will delete reference to lead-zinc mineralization to future descriptions of the NE Australia leg, and by copy of this letter I will ask ODP-TAMU to do likewise.

In summary, (a) It is an unfortunate circumstance that the JOIDES Office did not routinely inform earlier proponents of panel decisions. (b) The Planning Committee will again wrestle with the problem of a balance between interests that are, from the oceanographic point of view, unconventional as well as conventional, and how best to fill its panels to reflect diverse interests. (c) I see at this stage little chance that your proposal will be included for drilling, unless there are great problems with the sites that SOHP recommended and PCOM approved.

Your letter ended on a positive note, and I wish I could do the same in this reply. I believe there is more interest than you suggest, within the JOIDES community, about economic applications. I hope that there will be additional proposals, perhaps including ones from you and your associates, to examine the setting and processes of ore genesis.

Sincerely yours,

Ralph Moberly
PCOM Chairman

cc: A. Meyer
J. Malpas
L. Jansa
J. Welhan
T. Pyle
PCOM April Agenda Briefing Book

United States Department of the Interior
GEOLOGICAL SURVEY
U.S. Geological Survey
Woods Hole, MA 02543

TAKE PRIDE IN AMERICA

February 26, 1990

90-114

Dr. Ralph Moberly
ODP PCOM Chairman
JOIDES Planning Office
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu, Hawaii 96822

Dear Ralph:

In October you made an enquiry about concerns related to representation on PCOM by non-JOIDES institutions. As many of my colleagues know, I have always thought that the U.S. Geological Survey should have a more active role in DSDP-IPOD-ODP. Scientists within USGS have always been very active participants in the science advisory panel structure and drilling legs since the very beginning of the drilling program in 1968. This will continue, I am sure, to be a significant contribution to the scientific effort of ODP. My broader instincts, however, tell me that USGS, as one of the leading U.S. earth science government research agencies, should be doing more than this to help support our national scientific drilling effort. When I look at the benefit our French and German colleagues get from ODP, my perception is that it is often significantly greater than that of our American colleagues. One very plausible reason for this is the significant infrastructure support provided to their earth science ODP community by BGR, IFP and other government agencies, which I think is appropriate. There always have been concerns that USGS might dominate the program, but I think this would not happen considering the nature of the upper-level management structure of ODP. Most of the USGS influence is already deeply buried in the ODP science structure, and it is well received by our colleagues.

It is appropriate at this time for ODP to discuss with the upper-level management of USGS the possible participation of USGS on PCOM. This should be in addition to the rotating membership that is being considered for the non-JOIDES U.S. scientific community. These discussions obviously will need to focus on the benefits and obligations to both groups associated with this participation. Tight earth science funding budgets make it essential that we at least discuss the possible sharing of resources that would lead to an overall augmentation of the U.S. earth science research. USGS does have a large infrastructure for supporting earth science research that could be utilized to augement the U.S. science program of ODP, if properly channeled. This includes a variety of activities such as mapping, data-base management, cartography, analytic labs, publishing, seismic-processing, etc. These are all activities presently funded by NSF within a finite budget, with the result that each year ODP must make choices between critical elements that will receive adequate funds. I do not know what level of participation USGS upper-level management would consider viable, but I think it would be a positive benefit to ODP.

I would be willing to help with this matter, and I know that a number of my USGS colleagues would do likewise.

All the very best,

Kim D. Klitgord

cc: B.Butman, Chief, Atlantic Marine Geology Branch, USGS
D.Cacchione, Chief, Pacific Marine Geology Branch, USGS
B.McGregor, Deputy for Marine Programs, Office of Energy and Marine Geology, USGS
G.Hill, Chief, Office of Energy and Marine Geology, USGS
B.Morgan, Chief Geologist, USGS

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90-085

Dr. R. Moberly
JOIDES Planning Office
Hawaii Institute of Geophysics
University of Hawaii
2525 Correa Road
Honolulu HI 96822

9 February 1990

Dear Dr. Moberly;

Since last year I am a member (specialty: micropaleontology) of the Shipboard Measurements Panel. I have been very interested in the subject matter on the panel, and have become involved in several projects to make micropaleontology work better and more efficient onboardship. Therefore I would like to stay on the panel. I have, however, accepted a job offer from the University of Cambridge (U.K.), where I will start next june. My question to you is: can I remain on the panel when I move to the U.K., or is my tenure on the panel dependent on being a resident at a U.S. university? I would appreciate receiving your comment on this matter before the next SMP meeting (march 6-7).

In addition, I want to answer your letter regarding participation of scientists at non-JOI institutions in ODP activities. I personally have not found much difficulty in getting involved in ODP activities, but I can not be considered typical because of strong involvement in DSDP-ODP activities in the past. The complaint that I hear most often from geoscientists in non-JOI institutions is that it is so difficult to join cruises as shipboard scientist. Many scientists complain that there is not enough information available (even in the JOIDES journal) on the goals of upcoming cruises, so that it is very difficult for a scientist to figure out whether he/she would want to participate. The other complaint is that the information is available (in JOIDES journal) at such a late time that staffing is already partly completed by the time that people learn about a leg. There is a strong feeling that it is almost impossible to get on a cruise due to this lack of timely information, and the perception that shipboard-scientists form a strong "old-boys network", always asking their old friends and not considering new people. There is some truth in this, of course, because many co-chief scientsits like to have at least some reliable old hands onboard. On the other hand, something might be done about the information part. Could there not be advertisements in journals such as Geotimes or EOS (reaching outside the JOIDES community), describing upcoming cruises with their goals, at about the time that a drilling proposal is finally accepted and the leg scheduled? The information should document what the cruise objectives are, about how many sites are planned, and what the goals are for each site.

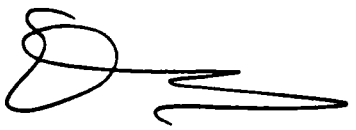
Another perceived problem concerns th submission of drilling proposals. Outside JOI institutions many people do not have the possibility to organize site surveys. Therefore many scientists feel that development of a drilling proposal (just the geological rationale, apart from logistics) is outside their reach. Would it be possible to encourage submission of proposals written with just the contents-background, and without the details of site surveys and how to organize them. I do not know whether

this would be feasible organizationally speaking, but it may be a good idea to give scientists the impression that one can have input in the organization of legs even without access to ocean-going vessels.

I hope this answers some of the questions that you raised regarding non-JOI institutions participants.

Sincerely Yours,

Ellen Thomas



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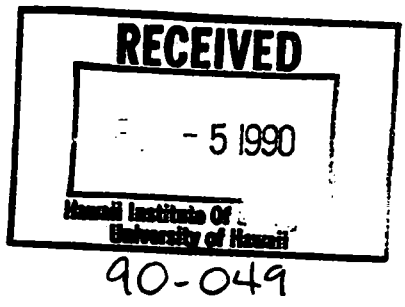
MARINE SCIENCE INSTITUTE SANTA BARBARA, CALIFORNIA 93106

January 30, 1990



Dr. Ralph Moberly
JOIDES Planning Office
Hawaii Institute of Geophysics
School of Ocean and Earth Science and Technology
University of Hawaii
2525 Correa Road
Honolulu, HI 96822

Dear Ralph:

I am replying to your letter of October 12 about non-JOIDES representation in higher levels of the decision-making structure.

I have received no actual complaints from the Geology Department at the University of California at Santa Barbara about this matter. Although we have a few individuals in this department who have participated in ocean drilling, most show little or no interest in ocean drilling. I have found intriguing the switch from a JOIDES to a non-JOIDES institution. The contrast in interest between the geological folks at each place is quite large!

My concern is more related to the future extension and renewal of the project. I think that the Planning Committee might well consider some representation of non-JOIDES institutions on the committee from this point of view alone. The ocean drilling project is being eyed as a source of funds for future non-ocean drilling activities. Individuals in my own department believe they would be funded if the Ocean Drilling Project ceased. So there is much more competition now than ever before because of the funding situation. Programs related to global change represent another example. Therefore, I have found it somewhat disturbing that the Long Range Plan makes insufficient effort to bring ocean drilling into the global change scientific initiatives. The program should not be seen by the scientific community as competing against programs dealing with

global change but instead being part of that effort. Bringing ocean drilling clearly into the global change effort will make it less easy for budgeteers to pick it off. I realize that ocean drilling is not all related to global change; nevertheless, that part which is should be stressed in the future reports.

Because of my membership on USSAC, I recently reviewed the Long Range Plan executive summary. I wish that you would look at that document from the point of view of National Science Board Member or Congressman. It looks suicidal to me! I am happy to send suggestions if you are further interested.

Sincerely,

James P. Kennett
Director of MSI and
Professor of Oceanography

JPK/dgh

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9 February 1990

Dear Colleague:

Recently the JOIDES Planning Committee established a Cascadia Detailed Planning Group, nominated a number of persons like yourself who have the appropriate expertise and interest to be useful members, and indicated preference for the chairperson. Larry Cathles has agreed to serve in the chair.

On behalf of the JOIDES Planning Committee, I invite you to be a member of the Cascadia Detailed Planning Group. The charge to the C-DPG is to examine the two active and competitive proposals for drilling in the Cascadia accretionary prism, and provide a prioritized plan for drilling. If the highest priorities cannot be accomplished in one leg, the DPG should make suggestions for later drilling.

The timing of the DPG meeting must be a compromise between the DPG's need to work with as complete sets of data as possible, and PCOM's need for the DPG report for its November 1990 meeting. Multi-channel seismic surveying off both Oregon and Vancouver Island late last summer provided miles of records still being processed, and that work will continue for several more months. The report must have the reviews and comments of the Sedimentary and Geochemical Processes and Tectonic thematic panels. Therefore the report, or at least a fairly complete draft of it, would be an item of discussion at the September or October 1990 panel meetings. Larry Cathles and I therefore believe the meeting should be in the mid or late summer, perhaps in early August. That would give as much time as possible before the meeting for processing of records, and yet allow sufficient time afterwards for the report.

The venue will probably be in the Pacific Northwest, and it probably would be a three-day meeting that includes some writing sessions, which, with cut-and-paste, should lead to a draft report by the time the meeting ends. Besides you members, non-US countries in JOIDES may each appoint an additional member of the DPG if they wish, but they should avoid additional proponents in order to maintain a balance. The PCOM liaison will be appointed in April. SGPP, TECP, and possibly other panels may want to send non-voting guests to act as liaisons. Other guests are allowed as well, but also must be non-voting and JOIDES cannot support their travel. A representative of the ODP Science Operator (Texas A&M University) can provide such help as estimates of drilling and steaming times.

Please let Larry* and me know if you are willing to serve on this important DPG. Also let Larry know about your summer commitments, so he can begin to search for a date. We will send you a packet of materials in advance of the meeting.

Sincerely yours,

Ralph Moberly
PCOM Chairman

Distribution:
J. Behrmann
M. Brandon
B. Carson
E. Davis
S. Dreiss
R. Hyndman
V. Kulm
C. Moore
G. Westbrook

cc: L. Cathles
T. Pyle (JOI)
A. Burns (JOI)
L. Garrison (ODP-TAMU)
R. Anderson (BRG-LDGO)
C. Brenner (ODP Data Bank)
I. Dalziel (TECP)
E. Suess (SGPP)
R. Kidd (SSP)
D. Rea (CEPAC-DPG)
PCOM April Agenda Briefing Book

* Dr. Larry Cathles
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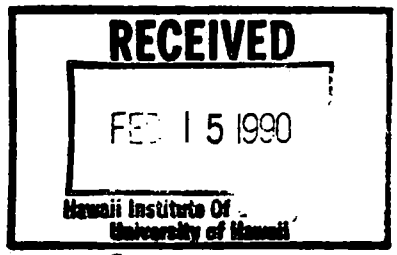
February 12, 1990



90-075

Dr. Ralph Moberly, Chairman
PCOM, JOIDES Planning Committee
Hawaii Institute of Geophysics
2525 Correa Road
Honolulu, Hawaii 96822

Dear Dr. Moberly:

This is a (greatly delayed) response to a letter from Dr. Pyle of 27 September 1989 in which he put forward a concept of a working group appointed in half by the Federation of Digital Seismic Networks (FDSN) and the ODP. Federation, at its annual meeting in Istanbul, authorized me to represent it in future contacts with the ODP.

I propose that in addition to myself, as a co-chair, the Federation be represented by;

1. Dr. Barbara A. Romanowicz
   Institut de Physique du Globe de Paris
   4, Place Jussieu
   75252 Paris Cedex 05, France

2. Prof. Kiyoshi Suyehiro
   Ocean Research Institute
   University of Tokyo
   1-15-1, Minamidai, Nakano-ku
   Tokyo 164, Japan

Dr. Barbara Romanowicz is now preparing an experiment involving lowering a broad-band seismograph into one of the existing boreholes using a wire-line re-entry approach. She is also the Chair of a Coordinating Committee on Terrestrial Observatories of the International Commission on Lithosphere. Prof. Suyehiro is in charge of the Japanese experiment in which a broad-band seismograph system was lowered into a recently drilled ODP hole in the Sea of Japan. The experiment has been successful and a large body of data is to be retrived very soon. Both nominees have agreed to serve on the working group.

While I apologize for the delay in this matter, I wonder whether the EXCOM could name the ODP counterparts and approve the structure, such that the working group could meet and prepare some preliminary recommendations for the forthcoming meeting of PCOM in Paris in late April. Experiments must be conducted in the near future if the deployment of permanent ocean both obsservatories could proceed at the pace envisioned in the ODP Planning Document.

Best regards,

Adam M. Dziewonski, Chairman
Federation of Digital Seismographic Networks

AMD:mkh

CC: T. E. Pyle, JOI
C. E. Helsley, Excom
B. T. Malfait, NSF
J. F. Hays, NSF
G. M. Purdy, WHOI
J. Orcutt, SIO

MEMORANDUM

Graduate School of Oceanography
University of Rhode Island
Narragansett, RI 02882

89-510

To: R. Moberly, PCOM Chairman. ***Date:*** November 30, 1989
From: R. Detrick RSD.
Subject: Sedimented Ridge drilling

At one point this past Fall I discussed ODP's plans for drilling at sedimented ridges with John Sieburth, a microbiologist here at GSO. John pointed out that this drilling would offer an excellent opportunity for studies of thermophilic archebacteria and for addressing questions such as the upper temperature limit for life. Thus there may be some interest in having a microbiologist participate in one or both of the sedimented ridge legs. In the attached memo he suggests the names of several experts working in this field.

Once co-chiefs for these legs have been selected, I hope you will pass along this memo to them and encourage them to explore the possibility of adding a biological component to the sedimented ridge program. It's exciting science and the PR could help ODP's image outside the geological community

RSD:cs
Encl.

Copy to
A Meyer
E Suess
T. Pyle
April '90 Accom Book ✓
File:
SROPG

INSTITUTE FOR GEOPHYSICS
THE UNIVERSITY OF TEXAS AT AUSTIN

8701 Mopac Boulevard · Austin, Texas 78759-8345 · (512) 471-6156 · Telex: 910-874-1380 UTIG AUS

Paris

24 November 1989

JOIDES Planning Committee
c/o Dr. Ralph Moberly, Chairman
Hawaii Institute of Geophysics
University of Hawaii
Honolulu, Hawaii 96822

Dear Planning Committee:

This letter solicits your endorsement of a plan to put a Global Positioning System (GPS) receiver on Sabine Bank, a coral-reef capped seamount, located about 60 km west of the convergent plate boundary of the Vanuatu arc (Figs. 1 and 2). By simultaneously occupying GPS sites on Sabine Bank and islands on the Vanuatu arc we can measure changes in the distance to Sabine Bank as the Indian-Australian plate is subducted at the intervening plate boundary.

I think that the science proposed can stand alone, but the Planning Committee's moral support would be particularly appropriate because a Sabine Bank GPS site would enhance the value of ODP Leg 134 presently scheduled for Vanuatu in October 1990 (Fig. 1). If you support our aims, then I request that you include a resolution in favor of them in PCOM minutes or even write a letter to Bruce Malfait with a copy to me that I can use to promote the plan with NSF or other funding agencies. I am not asking you to review the means by which we plan to achieve emplacement of such a GPS site. These plans involve considerable explanation that would complicate this request. However, I am noting the main facts, such as ship availability, that make this project possible.

Scientific Reasons for emplacing a GPS station on Sabine Bank

--With a GPS site on Sabine Bank we can measure the ongoing motion of the Indian-Australian plate toward the Vanuatu convergent boundary. The minimum average rate is the INDI/PCFC rate of 10 cm/yr nearly normal to the arc trend, but back arc basin spreading may add as much as 9 cm/yr to this rate. If the average contemporary rate is as fast as the mean geologic rate of 10 (or 19) cm/yr implies, then measurements on short time intervals will allow us to observe any variations in this rate.

--Given that ODP has devoted Leg 134 to study DR collision and its effects on the Vanuatu arc, with one hole to actually penetrate the interplate thrust, surely we want to know the nature of the slip that is occurring on this interplate thrust. Could it be smooth continuous slip with some small proportion accummulating as elastic strain to produce the occasional large interplate earthquake? Episodic aseismic slip? All plate convergence stored as elastic strain that is released as an earthquake preceded and followed by large amounts of aseismic slip? Why speculate when we can measure?

--The Sabine Bank is unusually close to a convergent plate boundary that is on the downgoing plate. On the upper plate, western Santo is about the closest you can be to an interplate thrust while standing on dry land (Fig. 1). Our other GPS baselines across the Vanuatu arc are at least 250 km long and in the southern part of the arc (Fig. 2). Far away from such a boundary relative plate motions may appear smooth even if the actual motion on the fault is jerky, but they should appear less smooth up close to the fault. Sites in such proximity to a convergent boundary usually involve

a much more intense collision than caused by the DR that would interfere with more-or-less normal subduction. It appears that subduction of the DR has strongly affected the structure and topography of the upper plate, but it is unlikely that the average rate of plate consumption is retarded. Our results will be the equivalent of a time-lapse film of the relative plate motions that cause the large vertical movements that have made central Vanuatu a distinctive arc setting.

-- The combined moment of all the historical shallow interplate earthquakes at Vanuatu accounts for only about 20% of the interplate slip implied by the relative plate motion rate of 10 cm yr. All known large interplate thrust events caused uplift of the frontal arc, but there has been no significant interseismic vertical movement. This requires explanation, because if 80% or more of the slip is aseismic then one might propose that 80% of the uplift should occur aseismically (interseismically). This situation provides some interesting questions for the GPS project to address and answer: How much plate convergence is actually being accommodated by the interplate thrust zone? Maybe it is only 2 cm/yr and there is no deficit in seismic slip and moment. I doubt that this is the case, but we need to measure it to know. If aseismic slip is required, then when is it occurring? Does aseismic slip occur continually or as creep within hours, days, or weeks of the major thrust events that short period seismographs can not detect? If aseismic slip is occurring continuously, but not causing vertical deformation, then this, too, would be an important discovery indicating that only seismic slip causes structural changes resulting in the accumulation of vertical deformation.

--Additional paleoseismicity studies in central Vanuatu are in progress, but our preliminary studies indicate that the South Santo segment has the shortest recurrence intervals (19 yr) for thrust earthquakes of about $M_S = 7.5$ that cause uplift of about 0.25 m (Fig. 3). The two most recent events for south Santo occurred in 1946 and 1965. This suggests that our timing is propitious for catching the coseismic part of an earthquake cycle. When such an earthquake occurs, about 2 meters of coseismic interplate slip will occur. It would be important to remeasure the distances between Sabine Bank and points on the Vanuatu arc following such an earthquake.

What and where is Sabine Bank?

Sabine Bank is a flat-topped reef built on a seamount on the d'Entrecasteaux Ridge (DR) about 80 km west of Santo and Malekula Islands and 60 km west of the subducting plate boundary (Figs. 1, 4 and 5). It is equivalent to an earlier stage of the drowned reef-capped Bougainville Seamount at a depth of about 1000 m which is in the process of impinging on the inner slope of the upper plate as it is subducted (Figs. 1, 5, and 6). Scheduled ODP hole DEZ-5 will drill through the reef on Bougainville Seamount (Fig. 6). Based on Figure 5, Sabine Bank should be subsiding at a rate of about 1 mm/yr if it is moving toward the Vanuatu arc at a rate of 15 cm/yr. Bathymetry on the top of Sabine Bank shows that depths as shallow as 7 m occur and some large areas have depths of less than 10 m (Fig. 4). ORSTOM divers assure me that hard grounds are common on top of Sabine Bank and I plan to look for myself next april.

GPS and the PI's on a Sabine Bank Project

With several collaborators, I am a PI in the South Pacific GPS Experiment funded by NSF for 5 years to conduct GPS measurements of horizontal plate motions across the New Caledonia-Vanuatu-Fiji-Tonga-Cook Islands area. The South Pacific project was organized by Mike Bevis at NC State University and myself and is coordinated by Mike Bevis. The collaborators on the Sabine Bank Project will be Bob Schutz and myself at UT-Austin, Mike Bevis, ORSTOM - Noumea scientists, and probably UNAVCO (University Navstar Consortium at CIRES, Boulder, CO). Since the South Pacific Project began in 1988, the collaborators on the Sabine Bank program have acquired funds for 3 GPS receivers of our own that allow us the flexibility to conduct special experiments such as Sabine Bank. In addition, UNAVCO is acquiring many dual-

frequency light-weight Trimble 4000STD GPS receivers. We have no shortage of GPS expertise or equipment if the Sabine Bank project is funded.

Because some of the most rapid uplift rates (at least 6mm/yr average rate at one point) known for any subduction zone occur on Santo and Malekula Islands, we included an arm of our GPS network extending into this area with 4 GPS bench marks built so far (Fig. 2). These and some additional sites that we have started constructing would be suitable for the land stations in a Sabine Bank project (Fig. 1).

How well can the GPS measure distances?
Over a distance of about 1600 km from Rarotonga to the Tonga arc (Fig. 2), Bob Schutz was able to determine baselines to within a centimeter . Over short distances typical of the Sabine Bank project the precision improves to a few mm. However, baselines from land stations to the Sabine Bank will be degraded to about 1 cm because of errors in relating the GPS antenna on the surface to our fiducial point planted on the sea floor at a depth of about 7 meters. This error is still well within the 10 to 19 cm/yr of plate consumption at the Vanuatu arc.

The key piece of equipment is an appropriate ship
This project is possible because ORSTOM-Noumea will providethe equivalent of about $300,000 in ship time and the help of 3 professional divers to set up the Sabine Bank installation and conduct the multiple occupations with GPS instruments. ORSTOM's new ship, the "Alis" is a 28 meter-long vessel with an A frame having a capacity of 5 metric tons. Commandant Pierre Furic and his crew and divers have expressed enthusiasm for our plan and have no fear that currents or waves will prevent our working on Sabine Bank. They do this kind of work for a living, they know Sabine Bank, and their judgment is the most significant assessment of the feasibility of field aspects of this project. I will visit Sabine Bank with them in April 1990 to find a specific site.

Thank you for your patience in considering this plan. Again, I only ask that you consider supporting the scientific obljectives. I have given you some of the reasons why we are confident that we can make a GPS instrument work on Sabine Bank. Our technical plans will be elaborated in our proposal where they can be examined in detail by the appropriate reviewers.

Sincerely yours,

Fred Taylor

Frederick W. Taylor
Research Scientist

cc: Ian Dalziel, Tectonics Panel
Rodney Batiza, Lithosphere Panel
Gary Greene
Jean-Yves Collot
Audrey Meyer
Lawrence Lawver

ABSTRACTS OF THE ODP PROPOSALS

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JOIDES Number: 221/E Add. *Date: 11/89*
Title: **Data Supplement to Eastern Equatorial Pacific Neogene Drilling Proposal**
Proponents: **N.G. Pisias and A. Mix**

The principal objective of the proposed drilling program is to obtain sediment records of the Neogene history of oceanic and atmospheric circulation in the equatorial Pacific. Two drilling transects are proposed crossing the major currents systems of the equatorial Pacific. These transects are located at 110°W and approximately 95°W. Based on the results of site surveys and the scientific objectives, two drilling plans are presented. An attached data package represents site survey information collected on recent cruise of the R/V Thomas Washington.

JOIDES Number: 317/E Add. *Date: 11/89*
Title: **Accretionary Sedimentary Wedge Deformation and Fluid Expulsion Processes: the Northern Cascadia Subduction Zone off Vancouver Island**
Proponents: **R.D. Hyndman and E.E. Davis**

The purpose of this addendum is, first, to provide an update on site survey work being carried out in the Vancouver Island margin proposal area. Second, in response to the reviews of some of the thematic panels, clarification is provided of the proposed deformation and fluid expulsion model based primarly on geophysical data, along with some geochemical implications. The primary objectives for drilling outlined in the original proposal remain unchanged:

- to obtain the data required to constrain models of sediment fluid expulsion and deformation during the accretion process;
- to provide calibration of shipborne geophysical measurements that provide the main regional constraints on accretion models;
- to estimate the area on the subduction thrust where the brittle rupture of major earthquakes can occur, using borehole fluid pressure and thermal data.

It is proposed to drill six sites. Four of these sites which have modest penetration (c. 500m.) are given highest priority: a basin reference, a

coherent deformation site, an incoherent deformation site and a hydrate site. Two additional sites (penetration >1000m.) are listed for a more complete program: a mature prism site and a deformation front thrust site.

JOIDES Number: **358/A** *Date: 11/89*
Title: **Formation of Volcanic Rifted Passive Continental Margins: Proposal for a Drilling Transect at the Vøring Margin.**
Proponents: **O. Eldholm, J. Skogseid and S.T. Gudlaugsson**

During Leg 104, the drilling of a single hole to the basement was the first step towards the understanding of the complex processes and series of events involved in the continental breakup and initial formation of oceanic crust at a volcanic margin. The concept of this proposal is therefore, to drill a transect of six holes, which includes Site 642, to sample a number of features formed during the rift-drift transition.
The overall drilling objective is to obtain a better geological framework to evaluate the genesis and evolution of a volcanic margin, and to provide boundary conditions for modelling the geodynamic processes involved. Specifically, the authors propose to address the following primary objectives: 1) late rift paleoenvironment; 2) emplacement of the dipping sequences; 3) continent-ocean boundary; 4) asymmetric breakup; 5) origin of sub-basement (including seaward dipping) reflections; 6) hotspot volcanism; 7) outer margin subsidence; 8) Cenozoic paleoenvironment; 9) ash stratigraphy; 10) continental uplift.

JOIDES Number: **359/A** *Date: 11/89*
Title: **Conjugate Passive Margin Drilling - North Atlantic Ocean (Preliminary Synopsis)**
Authors: **B.E Tucholke and al.**

It is proposed a drilling program that will systematically investigate the initiation and development of full rift systems in the North Atlantic. This requires study of both sides of the rift, i.e. conjugate margins. It will be studied two transect zones which approximate end members in terms of rift symmetry. One transect, Flemish Cap-Goban Spur, has generally symmetrical crustal structure and is bounded by ocean crust dating about Santonian. The second transect, northern Newfoundland Basin - Galicia Bank, is strongly asymmetrical, and its rift-to drift transition dates to Aptian time; in contrast to the relatively thick continental crust of Galicia Bank, the conjugate northern Newfoundland Basin contains what is interpreted to be highly extended and thinned continental crust.

JOIDES Number: **360/D** *Date: 12/89*
Title: **Back-Arc Hydrothermal Activity and Metallogenesis at the Valu Fa Ridge (Southern Lau basin, SW Pacific)**
Authors: **U. von Stackelberg, J. Erzinger, Y. Fouquet, P. Herzig, J. Morton and S. Scott**

The study of metallogenesis processes in back-arc environments such as the Lau Basin is a fundamentally different approach to the investigation of EPR-type (sediment-starved) and Guyamas Basin-type (sedimented) oceanic ridges.

This approach is not only complementary to the investigation of seafloor spreading centers, but it also corresponds more closely to major massive sulfide deposits on land. The Valu Fa Ridge is one of the few places known at the modern seafloor where an active back-arc hydrothermal system can be studied in statu nascendi. The main objective of this proposal is a better understanding of the complex interaction between tectonic, magmatic, hydrothermal and geochemical processes at active spreading centers in marginal basins. This includes the study of the fluid geochemistry, fluid flow pathes, the processes of deposition of hydrothermal oxides, sulfates and sulfides (especially massive sulfides), as well as the alteration of andesitic rocks in an active island-arc influenced back-arc spreading center. Drilling in the Lau Basin offers the rare opportunity to examine an important type of ore forming hydrothermal system at the modern seafloor. This has substantial implications on the understanding of ancient back-arc sulfide mineralization. A key issue of our Valu Fa Ridge drilling proposal is to increase our current knowledge of the relation between metallogenic processes which are responsible for the formation of a world-wide important class of ore deposits and the generation of new oceanic crust. This was addressed as a global scientific goal of ODP by the COSOD II Conference (1987) and the White Papers of the JOIDES Lithosphere, Sedimentary and Geochemical Processes Panels.
It is proposed to drill two bare-rock basement holes (about 200m penetration): LG4B on the most elevated part of central Valu Fa Ridge (1600 m water depth) in the vicinity of a recently discovered smoker field with 340°C hot vents, and LG4C on the Southern Valu Fa Ridge (1800 m water depth) in an extended area of low-temperature (40°C) hydrothermal discharge.

JOIDES Number: **361/A** *Date: 1/90*
Title: **A Proposal for Drilling an Active Hydrothermal System on a Slow-Spreading Ridge: Mid-Atlantic Ridge, 26°N (TAG Area)**
Authors: **G. Thompson, S.E. Humphris, K. Gillis, M. Tivey, H. Schouten, M. Kleinrock, M. Tivey, P.A. Rona, J.R. Cann**

The overall objective of this proposal is to characterize the subsurface nature of an active hydrothermal site on a low-spreading ridge. A suggested drilling strategy to achieve this goal would include: a) the nature and the distribution of deposits in the near surface of the hydrothermal system; b) the nature and the distribution of deposits in stockwork and root zone below the surface deposits; c) the nature and the characteristics of the down-welling zone in a hydrothermal cell; d) the location and the nature of the reaction zone (boundary between heat source and circulating fluid).
A prime site for drilling should be a large, mature deposit. Mature (1,000 years +) so that the underlying crust and root zone is well altered and cemented; this ensures good penetration and recovery and no major rubble problems. Large (200m +) ensures it covers a large zone and the drill penetrates the root zone, and covers a wide range of deposits, temperatures, etc. The TAG field located on the Mid-Atlantic Ridge at 26°N meet these requirements, and has the added advantages of showing zone refinement and a full range of temperature deposits. It is proposed to drill 2 or 3 shallow (100-300m) holes, 2 holes about 500-600m,and a deep hole (1.5-2 km).

JOIDES Number: **362/E Rev.** *Date: 1/90*
Title: **Proposal for Scientific Ocean Drilling, Chile Margin Triple Junction, Southern Chile Trench.**
Authors: **S.C. Cande, S.D. Lewis, G.K. Westbrook**

The drilling objectives for the southern Chile margin are focused on the effects of ridge crest subduction. The geophysical studies suggest that the major effect of the collision is that the margin goes through a period of gradually accelerating tectonic erosion before the ridge crest arrives at the trench, culminating in a period of rapid tectonic erosion when the ridge passes beneath the forearc, followed by a period of rebuilding. The basic objectives of the drilling program are to 1) test the model of what might be called "accelerated subduction erosion" and to 2) explore the mechanisms responsible for the subduction erosion.
The basic strategy that serves as foundation of the proposed Chile margin drilling is: 1) to determine the time-space distribution of materials in the forearc to constrain geometries and kinematics of the materials, and 2) in situ measurement of physical, chemical, and geological parameters to provide information about the processes operating in the forearc.
It is proposed to drill a total of 16 sites grouped as follows: 1) an east-west transect of the pre-collision zone; 2) an east-west transect of the collision zone; 3) a north-south transect of the collision zone; 4) the Taito Ridge; 5) a north-south transect of the post-collision zone; 6) an east-west transect of the post-collision.

JOIDES Number: **363/A** *Date: 1/90*
Title: **Plume Volcanism during the late Rift to Early Drift Phase of Grand Banks - Iberia Separation**
Authors: **B.E. Tucholke, J.A. Austin, L.F. Jansa, A.S. Edwards**

The Southeast Newfoundland Ridge and its associated crustal elements represent a microcosm of a volcanic passive margin, which apparently originated in response to interaction between a mantle plume and the southern part of the late-stage Grand Banks - Iberation rift zone. Proposed drilling in this area will address fundamental questions about the nature and role of hot-spot volcanism in and adjacent to continental-rift settings, the origin and age/depth history of volcanic plateaus containing seaward-dipping reflectors and of (?) volcanic ridges at a presumed continent-ocean boundary, the dynamics and geochemical characteristics of rift systems, plate kinematics of the North Atlantic, and the origin of high-amplitude magnetic anomalies. The proposed drillsites are located to optimize basement targets; they consequently will contribute generally, but not optimally, to our understanding of paleoceanography and sedimentary /geochemical processes ain the North Atlantic.
It is proposed to drill 5 sites.

JOIDES Number: **364/A** *Date: 1/90*
Title: **Thrust Units of Continental Basement in a Collisional Setting:the Sardinian-African Strait in Central Mediterranean**

Authors: **R. Sartori, L. Torelli, N. Zitellini, P. Tricart, G. Brancolini, R. Catalano, B. D'Argenio, R. Compagnoni**

The spectrum of convergent margins explored or to be explored (Barbados) or to be explored in the near future (Nankai, Cascadia) shall hopefully provide a good data set for deformations occurring in modern accretionary prisms. However, all these targets, as almost all the targets on convergent plate margins where subduction of oceanic lithosphere is occurring, address only to deformations happening in the non-metamorphosed, plastic sedimentary sequences covering the subduction system.
The authors propose to drill one deep hole in a collisional setting between Sardinia Island and the African coast of Tunisia, where crystalline-metamorphic units of different nature and paleogeographic pertinence are thrust onto each other and/or are sheared by strike-slip faults at quite shallow crustal levels.
The expected results include determination of: 1) nature of seismic reflectors bounding the different units; b) nature, amount and pressure of fluids occurring in the thrust/shear zone and physical parameters in fault rocks of the continental basement as in situ stress determination.

JOIDES Number: **330/A Add.** *Date: 1/90*
Title: **Mediterranean Ridge: an Accretionary Prism in a Collisional Context**
Authors: **M.B. Cita, A. Camerlenghi, L. Mirabile, G. Pellis, B. Della Vedova, W. Hieke, S. Nuti, R. Ramella**

The objectives of this drilling program are to study: a) deformation at convergent plate boundaries in a collisional context; b) interactions of the presence of a salt layer at shallow depth in the sediment sequence; c) mud diapirism.
Nothing is changed in the general scheme and in the individual drillsites. However, this addendum adds new arguments to the proposal 330/A on the basis of: a) new results from a cruise planned to provide information pertinent to the proposed drilling program; b) Tectonic Panel White Paper ; c) evaluation of the proposal by the thematic panels.

JOIDES Number: **365/A** *Date; 1/90*
Title: **Conjugate Passive Margin Drilling - North Atlantic Ocean**
Authors: **J. Austin, A. Grant, F. Gradstein, L. Jansa, C. Keen, K.E. Louden, P.R. Miles, M. Salisbury, J.C. Sibuet, S.P. Srivastava, B.E. Tucholke, and R.B. Whitmarsh**

The authors propose a drilling program that systematically investigates the initiation and the developement of full rift systems in the North Atlantic. This requires study of both sides of the rift, i.e. conjugate margins. It is proposed study of two transect zones which approximate ends members in terms of rift symmetry. One transect, Flemish Cap - Goban Spur, has generally symmetrical structure across the rift zone and assymmetrical beyond. It is bounded by ocean crust dating to about late Albian (110Ma). The second transect, northern Newfoundland - Iberia abyssal plain/Galicia Bank, is symmetrical in the south

and highly asymmetrical in the north. Its rift-to-drift transition dates to Aptian time (anomaly M0, 118Ma). In contrast to the relatively thick continental crust of Galicia Bank, the conjugate sections of northern Newfoundland basin and Iberia abyssal plain are highly extended and thinned crusts.
For study of passive-margin rift systems, these particular transects have several advantages: 1) they are characteristic of the spectrum of non-volcanic passive margins; 2) basement and intrabasement targets are accessible to the drill because of limited overburden, 3) they are geophysically well documented, 4) half of each transect already has significant drilling data available, and 5) the areas are logistically convenient for future work that could complement a drilling program.
The proposed sites will also serve purposes other than simply understanding passive margin evolution. For example, the Newfoundland basin and the Iberia abyssal plain sites located on highly extended crusts will sample thick and relatively complete sedimentary sections in the western and eastern margin "gateways" areas between the northern and central Atlantic; it will be thus very valuable in understanding the history of northern-source bottom water circulation in the Atlantic Ocean.

JOIDES Number: **366/A** *Date: 1/90*
Title: **Labrador-Greenland (Preliminary Proposal)**
Author: **M.H. Salibury**

This preliminary proposal is to apprise JOIDES advisory scientific structure of the oncoming Canadian survey plans in the Labrador-Greenland. The cumulative objective of these surveys is to image basin and basement structures under the conjugate margins of the Labrador Sea and selected portions of the Labrador Sea basin in order to study the tectonics, timing and sedimentary and erosional consequences of rifting. Ultimately, it is hoped to image a complete pull-apart system and to be able to fit the basin back together.
It is intended to submit a drilling proposal next fall 1990.

JOIDES Number: **367/C** *Date: 2/90*
Title: **Sedimentation History of a Cool Water Carbonate Continental Margin**
Author: **N.P. James**

Carbonate platforms constructed by sediments formed in subtropical. cool waters are poorly known and have rarely been drilled in the modern ocean. The Eucla Shelf, in the Great Australian Bight, is the largest shelf in the globe composed entirely of cool water carbonate sediments. The Cenozoic-modern part of this shelf, called the Eucla Platform, contains a complete history of sedimentation during the Cenozoic. Understanding such structures is fundamental to actualistic modelling of older phanerozoic platforms, unravelling the global history of Cenozoic/Quaternary sea level and understanding the interaction of oceanography and carbonate deposition.
The Eucla Platform is the carbonate cap to the rifted continental margin of southern Australia, deposited atop a thick Mesozoic sequence of clastic sediments following initial rifting of Antartica and Australia during the Jurassic. The platform comprises an onshore portion beneath the Nullarbor

Plain, an offshore portion forming the continental shelf and several deep water (400 to 1000m) terraces seaward of the shelf break. The steep, ? erosional, continental slope is fronted by a continental rise blanketed with carbonate sediments. The onshore exposures of Eocene-Miocene carbonates display an excellent, but unconformity-broken record of sedimentation in cool and warm-water settings. Several oil wells and numerous seismic surveys on the shelf have provided a framework of stratigraphy. Rocks and sediments dredged from the rise and submarine canyons incised into terraces suggest a complete record of Tertiary and Quaternary sedimentation.
A series of 3 drill sites are proposed: a shallow water (ca 250m) hole to sample the shelf margin sequence in a zone of large prograding clinoforms where stratigraphy can be tied to the onshore succession; a site on either the Eyre or Ceduna Terrace in intermediate water depth (ca 700m) to document "deep shelf" carbonate sedimentation, below the zone affected by major sea level fluctuations, thus allowing a tie between bathyal and shelf sequences; a final hole sited on the continental, in depths of ca 4000m, to permit correlation between existing ODP holes (281, 282, 264) on the abyssal plain and the shelf.

JOIDES Number: **368/E** *Date: 2/90*
Title: **Jurassic Pacific Crust: a Return to Hole 801C**
Authors: **R.L. Larson, P.R. Castillo, P.A. Floyd, A. Fisher, R.D. Jarrard, and R.A. Stephen**

The authors propose to characterize the petrology, hydrogeology, structure, and physical properties of the world's oldest oceanic crust created at a fast spreading rate in a type-locality situation. Middle Jurassic-aged sediments and oceanic crust were recovered from beneath the deep western Pacific Ocean at Site 801 on Leg 129 of the Ocean Drilling Program. Extrusive lava flows and pillow basalts underlie sediments deposited near the boundary of the Callovian/Bathonian Stages (170 m.y.) in the 5700m-deep Pigafetta basin. A total of 131 m. of ocean crustal section was penetrated in Holes 801B and 801C, with 20 m. of overlap between the two holes. The majority of the basement section was recovered from Hole 801C following installation of a reentry cone, and casing emplacement through the entire sediment section. No logging or other downhole geophysical experiments were conducted in basement during Leg 129, but the existing hole is stable and clean. Thus, we propose to deepen this hole to a total of 1000 m. in the crustal section that should penetrate the entire extrusive volcanic sequence and down in sheeted dikes. It is then proposed to conduct a comprehensive program of logging and downhole measurements that includes packer measurements and an oblique seismic experiment. The entire program will require 56 days, or approximately one leg of drillship time.
If this proposed program is successful, the seismic Layer2/Layer3 boundary could be reached with an additional 500 m. of penetration. This would require 7600 m. (25,000 ft) of total drillstring, and is possible with currently existing rotary drilling technology.

JOIDES Number: 369/A *Date: 2/90*
Title: **A Deep Mantle Section in the Mark Area: a Preliminary Proposal for the Ocean Drilling Program**
Authors: **C. Mevel, and M. Cannat**

In order to build models of oceanic spreading, it is needed data on magmatic processes (partial melting and magma extraction) and on the deformational characteristics (deviatoric stress, viscosity, 3D geometry of plastic flow) of the oceanic mantle below the ridge. The present information on the these processes comes largely from the study of basalts, gabbros, and peridotites sampled in the oceans by submersibles and by dredges.
A deep hole in the upper mantle at an active ridge would, in contrast with dredging and submersible studies, provide a relatively continuous vertical recovery and allow for good assessment of the nature of the lithological contacts, and of the chronology (cross-cutting relationships) of the various sets of structures.
The authors propose to drill a deep hole in the MARK area (Mid-Atlantic Ridge /Kane fracture zone), which is certainly the most extensively studied portion of the Mid-Atlantic Ridge. The site is located on a peridotite outcrop discovered with the Alvin and extensively explored with the Nautile.

JOIDES Number: 370/A *Date: 2/90*
Title: **Magmatic Processes and Natural Tracers - Deep Crustal Drilling Leg**
Authors: **H.J.B. Dick, and P.T. Robinson**

Layer 3 in the oceanic crust is the most poorly understood of all crustal components. This reflects not only the lack of samples but the fundamental difficulty in studying magmatic cycles in plutonic rock due to the complexity of magma chamber and post-cumulus processes. It is proposed to study magmatic processes in the oceanic crust in a region where the isotopic and trace element input of magma to the crust is highly variable, using this variability as a natural tracer to study and constrain magmatic processes in the oceanic crust.
The main objectives of this proposal are of: 1) test the isotopic and trace element variability of magmas entering the lower crust for comparison to those forming layer 3 to determine if extensive crustal magma-mixing is occurring to eliminate source heterogeneities in North Atlantic plume related ridge basalts; 2) drill a thick plutonic sequence in a region where isotopic and trace element character of the lower crust reflect variations in the local mantle source in order to use these variations to investigate magmatic processes in layer 3 ; 3) characterize layer 3 at slow spreading ridges near hot spots to examine the potential effect of enhanced magma supply at slow spreading ridges.
The authors propose to drill approximately 1500 m. into an exposed plutonic sequence at a single site near the Azores mantle plume. At the present time, the most likely site is the transverse ridge comprising the south wall of the Oceanographer Fracture Zone.

JOIDES Number: 371/E *Date: 2/90*
Title: **To Drill the Nova-Canton Trough**
Authors: **K. Becker, G. Brass, P. Castillo, B.R. Rosendahl**

This is a preliminary proposal to drill the Nova-Canton Trough. This trough is a 500 km long gash in the equatorial Central Pacific Ocean and its origin is still unresolved. Although this unknown origin is interesting, the real attractiveness for drilling is that this trough offers a window into the oceanic crust. The general picture that emerges from the existing geophysical data is that of a central graben bounded by normal faults, along which magmas have locally leaked out. Apperently, at least several kilometers of normal oceanic crust are exposed along the margins of the trough, at least where the flanking ridges are absent.

JOIDES Number: 372/A *Date: 2/90*
Title: **Cenozoic Evolution of Intermediate Water Circulation and of Vertical Chemical Gradients in the North Atlantic**
Authors: **R. Zahn**

New records of nutrient-related proxies $\delta^{13}C$ and Cd/Ca measured on benthic foraminera from intermediate-depth core sites suggest that mid-depth concentrations of CO_2 and dissolved nutrients were lower at the Last Glacial Maximum (approximately 18,000 years B.P.) than today. At the same time, concentrations of CO_2 and nutrients in the deep water were higher than today. That is, the vertical chemical structure of the ocean has changed on a glacial-interglacial time scale suggesting that CO_2 has been shifted between intermediate-depths and deep-ocean water masses. If external alkalinity sources remained reasonable stable, re-adjustements of the ocean's internal alkalinity cycle would have lowered the oceanic CO_2 partial pressure and fostered the transfer of CO_2 from the atmosphere to the oceans. These changes are likely to play an important role in defining the state of global climate. Long time series of benthic foramineral $\delta^{18}O$ and $\delta^{13}C$ from North Atlantic DSDP Sites 552 (2.3 km water depth) and 607 (3.4 km water depth) provide provisional evidence for a mid-Pleistocene shift towards enhanced vertical chemical gradients in the upper deep waters of the North Atlantic and lower frequencies of climatic variability. However, the spatial coverage and stratigraphic range of paleoceanographic proxy data available from mid-depth core sites is far too small to determine the mechanism which exerts primary control on the variability through time and the amplitude of the ocean's vertical asymmetry.
The author proposes here to obtain HPC cores from the Rockall Plateau and the upper Moroccan continental slope at water depths of 1100-1200 m. The drilling targets are critical to separating the long-term effects of convection in the open North Atlantic *versus* the advection of Mediterranean waters on the chemical domain of the mid-depth North Atlantic. Long term series of benthic $\delta^{18}O$ and $\delta^{13}C$ from these sites will be compared to similar records from the deeper North Atlantic DSDP sites 552 and 607 so as to assess the variability of vertical chemical gradients in the ocean through time and their relation to global climatic change.

JOIDES Number: 373/E *Date: 3/90*
Title: **Revisiting Site 505: State of Stress, Hydrologic Circulation and Heat Flow**
Authors: **M.D. Zoback, D. Castillo, K. Becker**

This a proposal to drill a hole ~ 1km into basement in 3.9 m.y.-old crust at DSDP site 505, approximately 80 km north of hole 504B. This experiment would address three sets of objectives. First, the proposed study would make important new data available on 1) the state of stress in young oceanic crust, 2) the nature of ridge flank hydrothermal processes and 3) the composition and physical properties of crust subjected to hydrothermal alteration where conductive heat flow (as measured at sea floor) is less than half that at site 504B. The low conductive heat flow at site 505 is apprently the result of appreciable convective heat flow transfer. By comparison with data already available from site 504B, the data we propose to obtain would make possible to address such fundamental questions as the origin of compressive intraplate earthquakes in young ocean crust, the hydrologic and thermal properties of convecting ocean crust and the physical and the chemical mechanisms responsible for the transition from convective to conductive heat flow near ridges. A second set of objectives of drilling at the 505 site is to provide a comprehensive lithostratigraphic and petrophysical comparison with site 504B. This comparison would make it possible to better understand the influences of temperature, fluid circulation and state of stress on physical properties and the degree and nature of chemical alteration as a function of age/distance from the rift axis. Finally, the authors have been advised that the 505 site is a excellent place for use of the HPC to obtain a high-resolution chronologic, climatic and atmospheric CO_2 record for the Plio-Pleistocene using carbonate and siliceous microfossils. This third set of objectives is not discussed in the proposal.

JOIDES Number: 374/A *Date: 3/90*
Title: **Mantle Heterogeneity Deep Hole at the Ocenographer Fracture Zone**
Authors: **H.J.B. Dick, J. Quick**

This proposal is for a mantle deep hole on the crest of the north wall of the Oceanographer Fracture Zone where the DSRV Alvin found a continuous exposure of serpentinite and altered peridotite from the base to the crest of the wall. The area is of particular interest given that it lies in an area of isotopic enrichment on the side of the Azores swell.
The principal objectives include: 1) Determine whether or not a variety of different primary melts reflecting fractional melting of an isotopically and trace element heterogeneous source have passed through the shallow mantle on their way to mixing in a shallow magma chamber; 2) Determine the shallow mantle stratigraphy, specially the location, position and abundance of features and lithlogies related to the late stage melt migration, for example podiform dunites; 3) Determine the nature and orientation of the petrofabrics reflecting the shallow mantle creep history and emplacement of the mantle to the base of the crust.

JOIDES Number: **375/E** *Date: 3/90*
Title: **Deep Crustal Drilling in Fast-Spreading Crust at the Hess Deep**
Authors: **H.J.B. Dick, K. Gillis, P. Lonsdale**

Recently a major new strategy for studying the deep ocean crust and shallow mantle was proposed to the drilling community by the JOI/USSAC Workshop on Drilling the Oceanic Lower Crust and mantle. Given the numerous and varied tectonic exposures of lower crustal and upper mantle rocks in the world oceans, it is proposed that these exposures be used to drill composite sections of the ocean crust in different tectonic environments by drilling a series of strategically chosen offset drill holes. This strategy has the particular advantage that it can give a three dimensional view of the ocean crust, by multiple penetrations of the same boundary or horizon, which cannot be obtained by single total penetration drill holes. Thus the Moho could be drilled repeatedly at a single location along a series of offset drill holes where it is tectonically exposed, such that a representative sampling of this horizon could be obtained in three dimensions.
This proposal is to drill a series of offset drill holes in the lower crust exposed on the walls of the Hess Deep in the Western Pacific, where old ocean crust has been uplifted to form steep walls where is being penetrated by a propagating rift axis. Recent submersible dives by the French in the Hess Deep have located a number of suitable locations for such a drilling, and a follow up American dive program will occur this spring which will presumably locate more potential drilling sites.

JOIDES Number: **376/A** *Date: 3/90*
Title: **Drilling the Layer 2-Layer 3 Boundary (and the Crust Mantle Boundary) on the Southern Wall of the Vema Fracture Zone.**
Authors: **J.M. Auzende, Y. Lagabrielle, E. Bonatti, M. Cannat, T. Juteau. V. Mamaloukas-Frangoulis, C. Mével, H.D. Needham**

Drilling the dyke complex-grabbro transition and the crust-mantle boundary in typical sections of complete oceanic crust is an important goal of the Ocean Drilling Program. Petrological, geochemical and structural data obtained from samples recovered along such transition zones would allow considerable increase in our understanding of oceanic lithosphere spreading and related deep hydrothermalism processes.
Among the main results of the french submersible dives surveying the southern wall of the Vema Fracture Zone in 1988 was the observation of a 2500m thick section of oceanic crust including from bottom to top: serpentinized peridotites, gabbros, sheeted dykes and basalts. Local observations clearly show that the dykes are rooted within the gabbros. Results of the dives indicate that each level of the oceanic crust is exposed along the fracture wall. Thus each transition between the different levels of the oceanic crust can be reached by drilling about 1000m holes.
Two sites are proposed. The first one should start in the dykes and would permit to reach the layer 2-layer 3 transition zone. The second one, starting in the gabbros may allow to reach the crust-mantle boundary.

JOIDES Number: **377/F Rev.** *Date: 3/90*
Title: **A Global Network of Permanent Ocean Floor Broad Band Seismometers: a Test Site Northeast of Oahu, Hawaiian Islands.**
Authors: **G.M. Purdy, A.M. Dziewonski**

The long-term goal (5-10 years) goal is to establish a global network of 15-20 permanent seismic observatories in the deep ocean. The scientific justification for this is strong and diverse: such a network would revolutionize studies of global earth structure, upper mantle dynamics and lithosphere evolution, earthquake source mechanisms, oceanic crustal structure, tsunami warning and monitoring and deep ocean noise sources and propagation mechanisms. Before such an ambitious goal can be realized many experimental and technical issues must be resolved. This requires a series of pilot experiments to make noise measurements, record data from teleseismic events for comparison with existing nearby island stations, and test new broad-band sensors and other long term deployment instrumentation. We propose to establish a test site at which the first of these pilot experiments can be carried out. An excellent location for these experiments is ~300 km northeast of Oahu, Hawaiian Islands. It is required a hole with 50-100m penetration into oceanic basement that is clean and stable, and is equipped with a reentry cone. High quality logging and VSP would be important components of the drilling program. All the required pilot experiments would be carried out by wireline reentry from a conventional research vessel during the next 2-3 years.

JOIDES Number: **378/A Rev.** *Date: 3/90*
Title: **Growth Mechanics and Fluids Evolution of the Barbados Accretionary Wedge**
Authors: **R.C. Speed, G.K. Westbrook, J.C. Moore, A. Mascle, X. Le Pichon, S. Dreiss, D. Karig, M. Langseth**

This revised version of proposal 342/A addresses fundamental issues of the mechanics of growth of accretionary wedges and their fluid-flow regimes, in a situation where major variables such as the thickness and type of sediment on the ocean floor have large variations, but others such as the direction, rate of subduction, and history of the convergent margin are common.
There are important aspects of the mechanics of growth of accretionary wedges that have not been studied before by the Ocean Drilling Program, and nor at the time of writing, are there other proposals that address them. Specifically, these are (i) the determination of the rate of advance of the wedge, as distinct from the rate of convergence of the plates, (ii) the development of thrusts with large displacements (several kilometers or more), (iii) the history of accretion and deformation of the wedge and its overlying cover of slope sediments (episodic growth), (iv) the tectonic and sedimentary interaction between the accretionary wedge and its forearc basin.
Of the two ODP Legs, 110 and 112, that have to date been the most successful in studying the fluid regime of forearc region, Leg 110 showed evidence for partitioning of the fluid flow regimes above and below the decollement, transient flow, and horizontal flow several km in advance of the wedge. The proposal is to make improved and better controlled observations on the sources and flowpaths of fluids (including lateral flow, out of section) in the known

area of activity proven by drilling, in a predominantly pelagic sedimentary section and extend these observations to the southern area where observations from seismic, heatflow, sidescan sonar, and porefluid chemistry in piston core show that there is active fluid flow in accreted sediments from a submarine fan.

JOIDES Number: **379/A** *Date: 3/90*
Title: **Scientific Drilling in the Mediterranean Sea: New Prospects**
Author: **J. Mascle**

Since 1986 and COSOD II conference, many reports from various ODP structures have strongly recommended to look both towards global perspectives and new frontier experiments. In this challenge, the author believes that the Mediterranean Sea can play its part because its represents the only area in the world where two large continents are progressively entering collision, therefore the Mediterranean is the only area where processes at colliding continental plate boundaries can really be studied.
The triple goals of this preliminary proposal are: 1) to propose global scientific targets that can be addressed using new development in drilling technology (deep hole); 2) to combine if possible deep drilling with "in situ" (logging) and possibly nearby geophysical experiments; 3) to preserve further use of holes for future potential in situ experiments that may be organized using other platforms.
A deep hole (1.5 km) is proposed into the peridotite in the Vasilov basin. The second hole is targeted to explore collision related mechanisms on the crest axis of the Mediterranean Ridge where evaporites are absent and where it is expected the maximum of stress.

JOIDES Number: **380/A Rev.** *Date: 3/90*
Title: **Drilling into the Clastic Apron of Gran Canaria: Evolution of a Linked System Volcanic Ocean Island-Sedimentary Basin**
Proponents: **H.-U. Schmincke, U. Bednarz, S. Cloetingh, A. Freundt, P.v.d. Bogaard, M. Menzies, W. Weigel and G. Wissmann**

This proposal is a revised version of proposal 349/A. This proposal presents a drilling program of five holes into the volcanic oceanic island of Gran Canaria (Canary Islands). The drilling targets are the ultimate aim of the interdisciplinary research project **VICAP** = *Volcanic Island Clastic Apron Project*. The purpose of this project is to study the physical and chemical evolution of a confined system "asthenophere - lithosphere - seamount - volcanic island - sedimentary basin" by drilling into the proximal, medial and distal facies of a volcanic apron, which formed by submarine volcanic activity during the early seamount stage, explosive volcanic activity in shallow water and on land, lava flows and pyroclastic flows enterin g the sea, and erosional activity.
The clastic apron is expected to contain material from throughout the entire evolution of the volcanic complex, including material no longer present on the island and - most importantly - material from the unexposed and unaccessible submarine stage. A major element of the program will be high precision single-crystal age dating with the aim of monitoring the island and basin evolution in time slices as detailed as 100.000 years.

JOIDES Number: **381/A** *Date: 3/90*

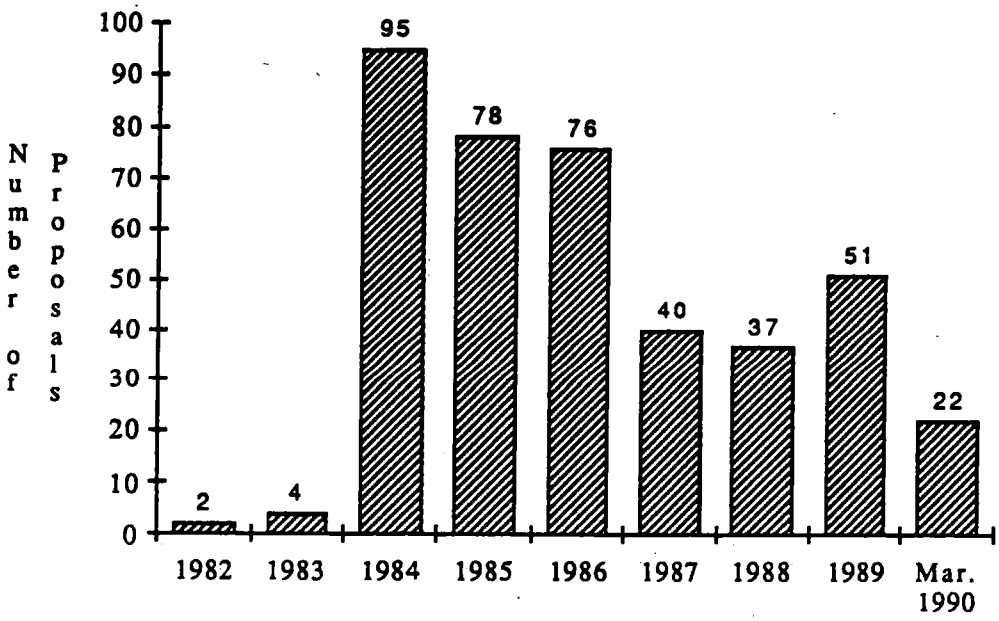
Title: **Scientific Objectives for Drilling on the Continental Shelf and Slope of Argentina**

Author: **B.T. Huber**

This is a preliminary proposal for deep-sea drilling of the continental shelf and slope of Argentina, between 35°S and 55°S latitude to recover an extensive record of passive margin sedimendation spanning from the Early Cretaceous opening of the South Atlantic Ocean to present. This is intended to complement the Hinz, Stein, et al. (May 1989) proposal referenced as 327/A for drilling on the Argentine continental rise.

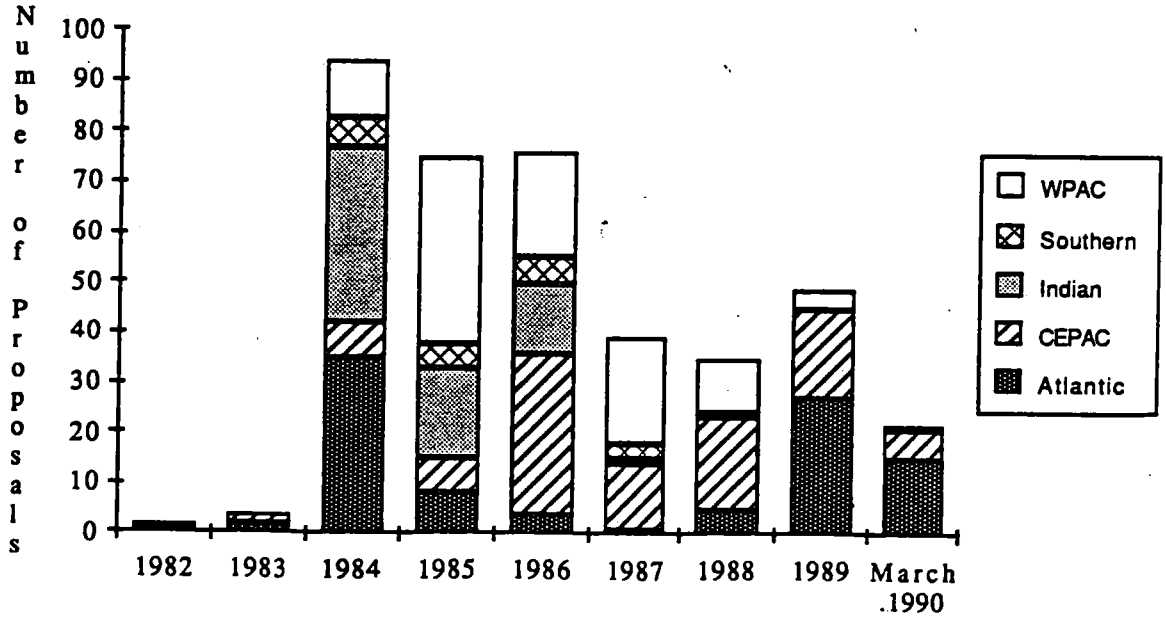
The major objectives of this proposal are to study: 1) Relative sea level changes on a passive margin; 2) Changes induced by the Early Cretaceous opening of the South Atlantic Ocean; 3) Global paleoclimatic changes; 4) Late Mesozoic-Cenozoic Southern Hemisphere magnetobiochronology; 5) Former presence of trans-South American seaways.

Proposals Received by the JOIDES Office, 1982 - April 1990



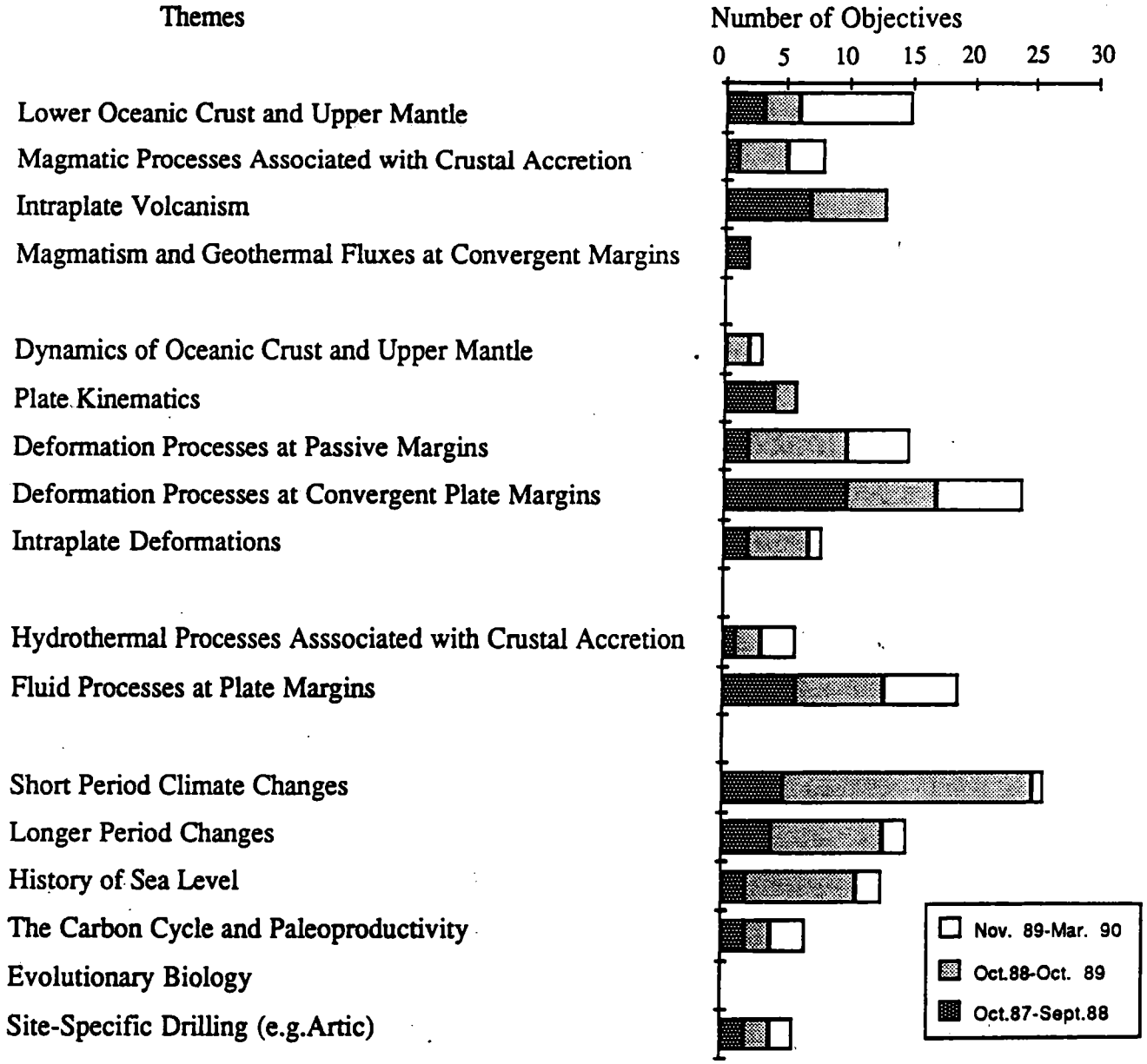
4 April 1990

Proposals vs Years and Oceans 1982 - March 1990



4 April 1990

OBJECTIVES OF RECENT PROPOSALS
(October 1987 to March 1990)
IN RELATION TO THEMES IN THE LONG RANGE PLAN



- 116 proposals have been received by the JOIDES Office from 1st October 1987 to 1st April 1990.

- A proposal can address more than one objective.

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A: Atlantic; B: Indian; C: Southern; D: Western Pacific; E: Central and Eastern Pacific; F: Instrumental

JOIDES No	Title	Proponents	Country	Date
71	[idea proposal]	-	-	
1/A	Pre-m. Cretac. history of SE Gulf of Mexico	Phair & al.	US	12/82
2/E	Middle America trench and Costa Rica margin	Crowe & al.	US	12/82
4/E	Tuamoto Archipelago (French Polynesia)	Okal & al.	US	6/83
5/A	Struc. & sedim. carbonate platforms	Mullins & al.	US	7/83
7/A	Gulf of Mexico & Yucatan	Buffler & al.	US	8/83
8/E	Southern Chile trench	Cande	US	9/83
9/A	Pre-Messinian hist. of the Mediterranean	Hsu & al.	ESF	1/84
11/A	Porto & Virgo seamounts, Iberian margin	Kidd & al.	UK/FR	1/84
12/A	Tyrrhenian back-arc basin transect	Cita & al.	ESF	1/84
13/F	Water column research lab	Wiebe	US	1/84
14/E	Zero age drilling: EPR 13°N	Bougault	FR	1/84
15/A	Formation of the Atlantic Ocean	Herbin	FR	1/84
16/A	Atlantic-Mediterranean relationship	Faugeres	FR	1/84
17/A	Gorringe Bank, deep crust & mantle	Mevel	FR	1/84
19/A	Eleuthera fan, Bahamas	Ravenne & al.	FR	1/84
20/A	Subduction collision: Outher Hellenic Arc	J.Mascle	FR	1/84
22/A	Rhone deep sea fan	Bellaiche & al.	FR	1/84
23/A	Carribean basins	A.Mascle & al.	FR	1/84
24/A	Barbados transects	A.Mascle & al.	FR	1/84
25/D	New Hebrides arc	ORSTOM team	FR	1/84
28/D	South China Sea	Letouzey & al.	FR	1/84
29/D	Ryukyu Island & Okinawa backarc basin	Letouzey	FR	1/84
31/B	Red Sea, paleoenvironmental history	Guennoc	FR	1/84
32/A	Yucatan basin	Rosencrantz & al.	US	1/84
33/A	Mediterranean drilling [same as 9/A]	Hsu	ESF	1/84
35/A	Barbados ridge accretionary complex	Westbrook	UK	2/84
38/A	Gulf of Mexico (DeSoto Canyon)	Kennett & al.	US	2/84
39/A	Cape Verde drilling	Hill	UK	2/84
40/A	Logging of site 534 (Blake-Bahamas basins)	Sheridan & al.	US	2/84
34/E	Pacific-Aleutian-Bering Sea (Pac-A-Bers)	D.W. Scholl & al.	US	3/84
41/A	N Barbados forearc: Struc. & hydrology	C.Moore	FR/US	3/84
42/D	Sunda Straits area	Huchon	FR	3/84
43/D	SW Pacific drilling outline	Falvey	AUS	3/84
44/B	Andaman Sea: Tectonic evolution	Peltzer & al.	FR	3/84
45/A	Equatorian Atlantic: Paleoenvironment	Ruddiman	US	3/84
47/D	Manila trench, S.China Sea	Lewis & al.	US	3/84
49/D	Eastern Banda arc/Arafura Sea	Schluter & al.	G	3/84
52/D	Solomon Sea	Milsom	AUS	3/84
53/F	Vertical Seismic Profiling	Phillips & al.	US	3/84
54/C	Sub-Antarctic & Weddell Sea sites	Kennett	US	3/84
55/B	Makran forearc, Pakistan	Leggett	UK	3/84
57/B	Deformation of African-Arabian margin	Stein	US	3/84
58/A	West Baffin Bay	Grant & al.	CAN	3/84
59/A	Continental margin instability testing	Weaver & al.	UK	3/84
60/A	Newfoundland basin: E. Canadian margin	Masson	UK	4/84
6/A	Labrador Sea, ocean crust & paleoceanogr.	Gradstein & al.	CAN	5/84
36/A	Norwegian Sea	Hinz & al.	G	5/84
18/A	Off Galicia Bank	Mauffret & al.	FR	6/84
63/A	Madeira abyssal plain	E.J.T. Duin & al.	NETH	6/84

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JOIDES No	Title	Proponents	Country	Date
64/A	Site NJ-6	Poag	US	6/84
67/D	Tonga-Lord Howe Rise transect	Falvey & al.	AUS	7/84
68/A	Deep basins of the Mediterranean	L.Montadert	FR	7/84
69/F	Rock stress meas. in part of Norwegian Sea	Stephansson	ESF	7/84
70/F	Borehole seismic experim. at 417 & 603	Stephen & al.	US	7/84
72/A	Two-leg transect on Lesser Antilles forearc	Speed & al.	CONSOR.	7/84
37/E	Costa Rica, test of duplex model	Shipley & al.	US	8/84
74/A	Continental margin of Morocco, NW Africa	Winterer & al.	US	8/84
75/E	Gulf of California	K.Becker & al.	US	8/84
77/B	Seychelles bank & Amirante trough	Mart	US	8/84
78/B	Indus fan	Kolla	US	8/84
79/B	Tethyan stratigraphy & oceanic crust	Coffin & al.	US	8/84
81/A	Ionian Sea transect, Mediterranean	Hieke & al.	G	9/84
82/D	Sulu Sea	Thunell	US	9/84
84/E	Peru margin	Kulm & al.	US	9/84
85/A	Margin of Morocco, NW Africa	D.Hayes & al.	US	9/84
56/B	Intraplate deformation	Weissel et al.	US	10/84
61/B	Madagscar & E Africa conjugate margins	Coffin & al.	US	10/84
65/B	S. Australian margin: Magnetic quiet zone	Mutter & al.	US	10/84
80/D	Sunda & Banda arc	Karig & al.	US	10/84
87/B	Carlsberg Ridge, Arabian Sea: Basalt obj.	J.Natland	US	10/84
90/B	SE Indian Ocean Ridge transect	Duncan	US	10/84
91/B	SE Indian Ocean Oceanic Crust	Langmuir	US	10/84
93/B	W Arabian Sea: upwelling, salinity etc.	Prell	US	10/84
94/B	Owen Ridge: History of upwelling	Prell	US	10/84
95/B	Asian monsoon, Bay of Bengal	D.Cullen & al.	US	10/84
96/B	Bengal Fan (Indus & Ganges Fans)	Klein	US	10/84
98/B	History of atmosph. circ. (Austral. desert)	D.Rea	US	10/84
99/B	Agulhas Basin paleoceanogr. clim. dynamics	W.Coulbourn	US	10/84
100/B	SE Indian Ridge transect: Stratigr. section	J.Hays & al.	US	10/84
101/B	Ridge crest hydrothermal activity	Owen & al.	US	10/84
102/B	Somali Basin	Matthias	US	10/84
103/B	Laxmi Ridge, NW Indian Ocean	Heirtzler	US	10/84
104/B	90° E Ridge transect	Curray & al.	US	10/84
105/B	Timor, arc-continent collision	Karig	US	10/84
106/B	Broken Ridge, Indian Ocean	Curray & al.	US	10/84
107/B	SE Indian Ridge: Stress in ocean lithosph.	Forsyth	US	10/84
108/C	E. Antarctic continental margin (Prydz Bay)	SOP-Kennett	US	10/84
109/C	Kerguelen - Heard Plateau	SOP-Kennett	US	10/84
110/C	Wilkesland - Adelie continental margin	SOP-Kennett	US/FR	10/84
111/C	SE Indian Ocean Ridge transect (subantarc.)	SOP-Kennett	US	10/84
112/B	Lithosphere targets	SOP-Kennett	US	10/84
113/B	Agulhas Plateau	SOP-Kennett	?	10/84
114/C	Crozet Plateau	SOP-Kennett	FR	10/84
117/B	Northern Red Sea	Cochran	US	10/84
118/B	Cenozoic history of E. Africa	Kennett & al.	US	11/84
76/E	Proposal for axial drilling on the EPR at 13°N	R. Hekinian & al	FR	11/84
62/B	Davie Fracture Zone	Coffin & al.	CONSOR.	12/84
119/B	Early opening of Gulf of Aden	Stein	US	12/84
120/B	Red Sea, Atlantis II deep	Zierenberg & al.	US	12/84

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JOIDES No	Title	Proponents	Country	Date
122/A	Kane fracture zone	Karson	US	12/84
123/E	Studies at site 501/504	Mottl	US	12/84
124/E	To deepen Hole 504B	LITHP-K.Becker	US	1/85
125/A	Bare-rock drilling at the Mid-Atl. Ridge	Bryan & al.	US	1/85
126/D	Drilling in the Australasian region	Crook & al.	AUS	1/85
127/D	E Sunda arc & NW Austral. collision	Reed & al.	US	1/85
128/F	Phys.props. in accretionary prisms	Karig	US	1/85
130/D	Evolution of the SW Pacific (N of New Zeal.)	J.Eade	NZ	1/85
131/D	Banda Sea basin: Trapped ocean crust etc.	Silver	US	3/85
132/D	TTT-Type triple junction off Bosco,Japan	Ogawa & al.	J	3/85
133/F	In-situ sampling of pore fluids	McDuff & al.	US	3/85
135/B	Broken Ridge: Thermo-Mechanical Models	Weissel & al.	US/UK	3/85
10/A	Cenozoic circulation off NW Afric	Sarnthein & al.	G/US	4/85
115/B	Agulhas Plateau and adj. basins	Herb & al.	ESF	4/85
116/B	E & Chagos-Laccadive Ridge drilling	Oberhansli & al.	ESF	4/85
142/E	Ontong-Java Pl.:Equat. Pacific depth trans.	L.Mayer & al.	CAN/US	4/85
88/B	Chagos-Laccadive-Mascarene volc. lineament	Duncan & al.	US	5/85
147/D	South China Sea	Wang & al.	CHINA	6/85
179/D	Daito ridges region: NW Philippines Sea	Tokuyama & al.	J	6/85
21/A	Thyrrenian Basin: Rifting, stretching,accr.	Rehault & al.	FR	7/85
51/D	Sea of Japan	Tamaki & al.	J	7/85
97/B	Equatorial Indian Ocean:Fertil.& carb.comp.	Peterson	US	7/85
136/C	Kerguelen - Heard Plateau	Schlich & al.	FR	7/85
146/D	Toyamu fan, E Japan Sea	Klein	US	7/85
150/B	90°E Ridge & Kerg.-Gaussb. Ridge: hard rock	Frey & al.	US	7/85
151/D	Japan Sea: Mantle plume origin	Wakita	J	7/85
152/F	Borehole seismic experim., Tyrrhenian Sea	Avedik & al.	FR/US	7/85
153/E	Three sites in the SE Pacific	J.Hays	US	7/85
154/D	Banda-Celebes-Sulu basin entrapment	Hilde	US	7/85
156/D	Kita-Yamam. trough, Japan Sea: Massive sulf.	Urabe	J	7/85
157/D	Japan Sea paleoceanography	Koizumi & al.	J	7/85
158/D	Japan Sea & trench: Geochem & sedimentol.	Matsumoto & al.	J	7/85
159/F	Phys.cond. across trench: Izu-Mariana-...	Kinoshita & al.	J	7/85
160/F	Geophys. cond. of lithosp. plate, Weddell Sea	Kinoshita & al.	J	7/85
161/F	Magn.field & water flow measurement	Kinoshita & al.	J	7/85
162/F	Offset VSP on the SW IO Ridge fract.zones	Stephen	US	7/85
164/D	Japan trench & Japan-Kuril trenches juntion	Jolivet & al.	FR	7/85
165/D	Shikoku basin ocean crust	Chamot-Rooke & al.	FR	7/85
166/D	Japan Sea: Evolution of the mantle wedge	Tatsumi & al.	J	7/85
168/D	Japan Sea: Sedim. of siliceous sediments	Iijima & al.	J	7/85
169/C	South Tasman Rise	Hinz & al.	G	7/85
170/D	Valu Fa Ridge, Lau Basin: Back-arc spread.	Morton & al.	US	7/85
30/B	Davie Ridge & Malagasy margin, Indian Ocean	Clocchiatti & al.	FR	8/85
50/D	Nankai trough & Shikoku forearc	Kagami & al.	J	8/85
73/C	Antarctic margin off Adelie coast	Wannesson & al.	FR	8/85
92/B	Crozet Basin, seismic observatory	Butler & al.	US	8/85
137/B	Fossil ridges in the Indian Ocean	Schlich & al.	FR	8/85
138/B	Rodrigues triple junction, Indian Ocean	Schlich & al.	FR	8/85
139/B	Agulhas Plateau, SW Indian Ocean	Jacquart & al.	FR	8/85
140/B	Central & N. Red Sea axial areas	Pautot & al.	FR	8/85

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JOIDES No	Title	Proponents	Country	Date
141/B	Indus Fan	Jacquart & al.	FR	8/85
172/D	Mariana forearc, arc & back-arc basin	P.Fryer	US	8/85
173/B	Seychelles, Mascarene Pl., NW Indian Ocean	Patriat & al.	FR	8/85
174/D	Japan Sea: Forearc tectonics	Otsuki	J	8/85
175/D	Japan Trench: Origin of Inner Wall	Niitsuma & al.	J	8/85
176/D	S.Japan Trench: Migration of Triple Junction	Niitsuma	J	8/85
178/D	Nankai trough forearc	Shiki & al.	J	8/85
180/D	N.Philippines Sea: Kita-Amami basin & plat.	Shiki	J	8/85
181/D	Izu-Ogasaw.-Mariana forearc:Crust & mantle	Ishii	J	8/85
182/E	Sounder Ridge,Bering Sea: Stratigraphy	A. Taira	J	8/85
184/D	Papua New Guinea/Bismark Sea Region	N.Exon & al.	AUS/US	8/85
185/C	Kerguelen Plateau: Origin, evol. & paleo.	Coffin & al.	AUS	8/85
186/F	SW Ind.Ocean fracture zones hydrology etc.	von Herzen	US	8/85
86/B	Red Sea	Bonatti	US	9/85
187/D	New Hebrides arc region, SW Pacific	F.Taylor & al.	US	9/85
188/F	395A boreh.geophys. & 418A drill.& geophysics	M.Salisbury	CAN	9/85
189/D	Tonga Ridge and Lau Ridge Region	A.Stevenson & al.	US	10/85
191/D	Solomon Isl.: Arc-plateau coll. & intra arc	Vedder & al.	US	10/85
192/E	Baranoff fan, SE Gulf of Alaska	Stevenson & al.	US	10/85
193/F	Upper ocean partic.fluxes in Weddell Sea	Biggs	US	11/85
3/E Rev/1	Flexural moat, Hawaiian Islands	A.B. Watts & al	US	11/85
143/F	In-situ magnet. susc. measurements	Krammer & al.	G	12/85
195/E	Paleoenv. & Paleoclim. in the Bering Sea	C. Sancetta & al.	US	12/85
196/B	90°E Ridge: Impact of India on Asia	J.Peirce	CAN	12/85
197/B	Otway Basin/W.Tasman region	Wilcox & al.	AUS	12/85
198/D	Ulleung Basin: Neogene tectonics & sedim.	Chough & al.	COREA	12/85
199/E	Pelagic sediments in the sub Artic gyre (N.Pacific)	T.R. Janecek & al.	US	12/85
200/F	Borehole magnet. logging on leg 109 (MARK)	Bosum	G	12/85
201/F	High-precision borehole temp. measurements	Kopietz	G	12/85
205/A	Bahamas: Carb.fans, escarpm.erosion & roots	Schlager & al.	ESF	12/85
202/E	N.Marshall Isl. carbonate banks	S.O. Schlanger	US	1/86
203/E	Guyots in the central Pacific	E.L. Winterer & al.	US	1/86
207/E	Bering Sea basin & Aleutian ridge tectonics	Rubenstone	US	1/86
208/B	Ancestral triple junction, Indian Ocean	Natland & al.	US	1/86
209/C	Eltanin fracture zone	Dunn	US	1/86
210/E	NE Gulf of Alaska: Yakutat cont. margin	Lagoe & al.	US	1/86
211/B	Deep stratigraphic tests	SOHP -Arthur	US	1/86
212/E	Off northern & central California	Greene	US	1/86
213/E	Aleutian subduction: accret. controlling p.	McCarthy & al.	US	1/86
214/E	Central Aleutian forearc:Trench-slope break	Ryan & al.	US	1/86
215/B	Red Sea: Sedim. & paleoceanogr. history	Richardson & al.	US	2/86
216/D	South China Sea	Rangin & al.	FR	2/86
217/D	Lord Howe Rise	Mauffret & al.	FR	2/86
218/D	Manila trench & Taiwan collis.zone, SCS	Lewis & al.	US	2/86
219/B	Gulf of Aden evolution	Simpson	US	3/86
220/D	Three sites in the Lau Basin	J. Hawkins	US	3/86
222/E	Ontong-Java Pl.: Origin, sedim. & tectonics	Kroenke & al.	US	3/86
221/E	Equatorial Pacific: late Cenoz. Paleoenv.	N.G. Pisias	US	3/86
83/D	Izu-Ogasawara (Bonin) arc transect	Okada & al.	J	4/86
134/B	Gulf of Aden	Girdler	UK	4/86

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JOIDES No	Title	Proponents	Country	Date
171/D	Bonin region: Intra-oceanic arc-trench dev.	B.Taylor	US	4/86
223/B	Central Indian Ocean fracture zone	Natland & al.	US	4/86
225/E	Aleutian Basin, Bering Sea	A.K.Cooper & al.	US	4/86
224/E	Escanaba Trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	4/86
89/B	SWIR, mantle heterogeneity	Dick & al.	US	5/86
121/B	Exmouth & Wallaby Pl. & Argo Abys. Plain	U.von Rad & al.	US	5/86
129/C	Bounty trough	Davey	NZ	5/86
227/E	Aleutian Ridge, subsidence and fragment.	Vallier & al.	US	5/86
228/C	Weddell Sea (E Antarctic contin. margin)	Hinz & al.	G	5/86
229/E	Bering sea, Beringian conti. slope & rise	A.K. Cooper & al.	US	5/86
230/C	Wilkes Land margin, E Antarctica	Eittreim & al.	US/J	5/86
231/E	North Pacific magnetic quiet zone	Mammerickx & al.	US	5/86
232/E	N.Juan de Fuca R.: High temp.zero age crust	E.Davis & al.	CAN	5/86
26/D	Tonga-Kermadec arc	Pelletier & al.	FR	6/86
144/D	Kuril forearc off Hokkaido: Arc-arc collis.	Seno & al.	J	6/86
145/D	Ryukyu arc: Left-lateral dislocation	Ujiie	J	6/86
148/D	Near TTT-type triple junction off Japan	Ogawa et al.	J	6/86
149/D	Yamoto Basin,Sea of Japan: Active Spreading	Kimura & al.	J	6/86
167/D	Okinawa trough & Ryukyu trench	Uyeda & al.	J	6/86
234/E	Aleutian trench: Kinematics of plate cover.	von Huene & al.	US	6/86
235/D	Solomon Sea: Arc-trench dev., back-arc...	Honza & al.	CONSOR.	6/86
236/E	N.Gulf of Alaska	Bruns & al.	US	6/86
237/E	Active margin off Vancouver Isl., NE Pac.	Brandon & al.	CAN/US	6/86
238/F	Pore pressure in the Makran subduction z.	Wang & al.	US	6/86
239/D	Two sites in the Lau Basin	D.Cronan	UK	6/86
214/E	Gulf of Alaska (Yakutat block) & Zodiak fan	Heller	US	6/86
243/D	Outer Tonga trench	Bloomer & al.	US	6/86
240/B	Argo abyssal Plain	Gradstein	CONSOR.	7/86
245/E	Transform margin of California	Howell & al.	US	7/86
246/B	Mesozoic upwelling off the S.Arabian margin	Jansa	CAN	7/86
247/E	NE Pacific: Oceanogr.,climatic & volc. evol.	D. Rea & al.	US/CAN	7/86
226/B	Equat.Indian Ocean: carb. system & circul.	Prell & al.	US	8/86
244/C	Western Ross Sea	Cooper & al.	US/NZ	8/86
248/E	Ontong-Java Plateau	Ben-Avraham & al.	US	8/86
249/E	Sedimentation in the Aleutian trench	Underwood	US	8/86
250/E	Navy fan, California borderland	M..B. Underwood	US	8/86
251/B	Seychelles-Mascarene-Saya de Mayha region	S.N. Khanna	SEYCH.	8/86
253/E	Shatsky Rise:Black shales in ancestr. Pac.	S.O. Schlanger & al.	US	8/86
254/A	NW Africa: Black shales in pelagic realm	Parrish & al.	US	8/86
255/A	Black shales in the Gulf of Guinea	Herbin & al.	FR/US	8/86
256/E	Queen Charlotte Transform fault	Hyndman & al.	CAN	9/86
257/E	Farallon Basin, Gulf of California	L. Lawver & al.	US	9/86
204/A	Florida escarpment transect	Paull & al.	US	10/86
252/E Rev.	Loihi Seamount, Hawaii	H. Staudigel & al.	US	10/86
258/E	Stockwork zone on Galapagos Ridge	R. Embley & al	US	10/86
260/D	Ogasawara Plateau, near Bonin arc	T. Saito & al.	J	10/86
261/E	Mesozoic Pacific Ocean	R.L. Larson & al.	US/FR	10/86
262/B	Mid Indus Fan	B.Haq	US	11/86
263/E	S.Explorer Ridge, NE Pacific	R.L. Chase & al.	CAN	11/86
206/D	Great Barrier R.: Mixed carb/epiclast.shelf	Davies & al.	AUS	12/86

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JOIDES No	Title	Proponents	Country	Date
264/A	Montagnais impact struct.,Scotia Sh.	Grieve & al.	US	12/86
265/D	Western Woodlark Basin	S.D. Scott & al.	CAN/AUS/PNG	12/86
266/D	Lau Basin	Lau Group	CONSOR.	12/86
267/F	Old crust at converg. margins: Argo & W.Pac	C.H. Langmuir & al	US	12/86
268/D	Hydrothermal ore deposition, Queensland Pl.	Jansa et al.	CAN	12/86
269/E	Aleutian pyroclastic flows in marine envir.	Stix	CAN	12/86
27/D Rev.	Sulu Sea marginal basin	Cl. Rangin & al	FR	1/87
48/D Add.	Sulu Sea transect	Cl. Rangin	G/FR	1/87
270/F	Tomographic imaging of hydrotherm. circul.	Nobes	CAN	1/87
271/E	Paleoceanogr. trans. of California current	Barron & al.	US	2/87
272/F	Long-term downh. measurem.in seas a. Japan	Kinoshita	J	2/87
183/D	Periplatform ooze, Maldives, Indian Ocean	Droxler & al.	US	3/87
259/E Rev.	Meiji sediment drift, NE Pacific	L.D. Keigwin	US	3/87
274/D	South China Sea	Zaoshu & al.	CHINA	3/87
275/E	Gulf of California (composite proposal)	Simoneit & al.	US	3/87
232/E Add.	Clay miner. & geoch.: Juan de Fuca Ridge	B. Blaise & al.	CAN/FR	3/87
276/A	Equat. Atlantic transform margins	J.Mascle	FR	4/87
277/E	Aseismic slip in the Cascadia margin	Brandon	US	4/87
278/E	Blanco transf. fault: Alter., layer three.	R. Hart & al	US	5/87
279/E	Anatomy of a seamount: Seamount 6 near EPR	R.Batiza	US	5/87
280/E	Cretac.Geisha Seamounts & guyots, W-Pac	P.R. Vogt et al.	US	6/87
281/D	Accret.prisms at Kuril/Japan trench&Nankai Tr.	Y. Okumura & al.	J	6/87
282/E	Tracing the Hawaiian hotspot.	N. Niitsuma & al.	J	6/87
283/E	Kuroshio current and plate motion history	R.D.Jacobi & al.	US	6/87
284/E	Escanaba Trough,S-Gorda Ridge Hydrothermalism	Zierenberg & al.	US	7/87
285/E	Jurassic quiet zone ,Western Pacific	Handschumacher & al.	US	7/87
286/E	Return to 504/B to core & log layer 2/3 trans.	K.Becker	US	7/87
287/E	Deep drilling in the M-Series,Western Pacific	D. Handschumacher & al.	US	8/87
288/B	Repositioning of EP2 to EP12,Exmouth Plateau	Mutter & al.	US	8/87
289/E	Mass budget in Japan Arc-10Be Geochemical Ref.	S. Sacks & al.	US/J	8/87
66/F Rev.	Laboratory rock studies to reveal stress	N.R. Brereton	UK	9/87
76/E Rev.	EPR: oceanic crust at the axis	R. Hekinian	FR	9/87
177/D Rev.	Zenisu Ridge: Intra-oceanic plate shortening	A. Taira & al.	J/FR	9/87
224/E Rev.	Escanaba trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	9/87
242/D	Backthrusting & back arc thrust., Sunda arc	Silver & al.	US	9/87
290/E	Axial Seamount, Juan de Fuca Ridge	P.Johnson & al.	US	9/87
291/E	Drilling in the Marquesas Islands chain.	J.H. Natland & al.	US	9/87
292/D	Drilling in the SE Sulu Sea	Hinz & al.	G	9/87
293/D	Drilling in the Celebes Sea	K. Hinz & al.	G	9/87
155/F Rev/1	Downhole measurt.in the Japan Sea	T. Suyehiro & al	J	9/87
294/D	Ophiolite analogues in the Aoba Basin,Vanuatu	J.W.Shervais	US	10/87
46/D	South China Sea margin history	D.Hayes & al.	US	11/87
273/C	Southern Kerguelen Plateau	Schlich et al.	FR/AUS	11/87
295/D	Hydrogeol.& structure,Nankai accr.complex	J.M. Gieskes & al.	US	12/87
296/C	Ross Sea, Antarctica	Cooper & al.	US/NZ/G	12/87
297/C	Pacific Margin of Antartic Peninsula	P.F. Barker	UK	12/87
247/E Rev.	NE Pacific: Oceanogr.,climatic & volc.evol.	B.D. Bornhold	CAN/US	1/88
298/F	Vertical seismic prof. in Nankai Tr. ODP Sites	G.F. Moore	US	1/88
299/F	Self-bor. p-meter: study deform.in accr. sed.	M.Brandon & al.	US/CAN	2/88

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JOIDES No	Title	Proponents	Country	Date
300/B	Return to site 735B-SW Indian Ridge	H. Dick & al.	US/CAN	2/88
301/D	Integrated proposal: Nankai forearc	J.Gieskes & al.	US/J	3/88
302/F	Electrical conductivity structure,E-Japan Sea	Y.Hamano & al.	J	3/88
194/D Rev/2	South China Sea	K.J. Hsü & al.	CHINA	4/88
303/E	Fracturing /volcanism on Hawaiian swell	B.Keating	US	4/88
190/D Add.	New Hebrides (Vanuatu) arc-ridge collision	Fisher & al.	US/FR	5/88
163/D Rev.	Zenisu Ridge: Intraplate deformation	S. Lallemant & al	FR	6/88
221/E Suppl.	Equatorial Pacific: L.Cenozoic paleoenviron.	N. Pisias & al.	US	6/88
304/F	ODP Nankai downhole observatory	H.Kinoshita & al.	J	6/88
305/F	Artic Ocean drilling	P.J. Mudie & al.	CAN	6/88
306/E	Old Pacific History	Y.Lancelot & al.	FR/US	6/88
233/E Rev.	Oregon accr. complex: fluid proc. & struct.	L.D. Kulm & al.	US	7/88
307/E	Cross Seamount, Hawaiian swell	B. Keating	US	7/88
308/E	Reactivated Seamounts,Line Island chain.	B.Keating	US	7/88
3/E Add.	Drilling in vicinity of Hawaiian Islands	R.S.Detrick & al	US	7/88
222/E Rev.	Ontong Java Pl.: origin, sedim. & tectonics.	J. Mahoney & al.	US	7/88
155/F Rev/2	Downhole measurement in the Japan Sea	T. Suyehiro & al	J	8/88
309/F	VSP Program at sites Bon-2 and Bon-1	P.Cooper	US	9/88
310/A	Geochemical sampling ,dippings ,E-Groenland	A.Morton & al.	UK	9/88
311/A	Sedim. equivalent of dippings ,Rockall	D.Masson & al.	UK	9/88
312/A	Potential of drilling on Reykjanes Ridge	J.Cann & al.	UK	9/88
313/A	Evolution of oceanog. pathway: The Equat. Atlan.	E.Jones & al.	UK	9/88
314/D	Fluid flow & mechan. response, Nankai	D.Karig & al.	US	9/88
316/E	To drill a gaz-hydrate hole (West Pacific)	R. Hesse & al.	CONSOR.	9/88
59/A Rev.	Continental margin sediment instability	P.P.E.Weaver & al	UK/NETH/CAN	9/88
3/E Rev/2	Flexural moats, Hawaiian Islands	A.B. Watts & al.	US	10/88
315/F	Network of perm. ocean floor broad band seism.	G.M. Purdy & al.	US	10/88
275/E Rev.	Drilling the Gulf of California	Simoneit (ed.) & al	US	10/88
271/E Rev.	Paleocean. transect of California current	J.A. Barron & al	US	10/88
195/E Suppl.	Paleoenviron. and paleoclim. in the Bering Sea	D.W. Scholl & al	US	10/88
199/E Suppl.	High latitude paleoceanography	D.W. Scholl & al	US	10/88
231/E Suppl.	Plate reconstr. & Hawaiian hotpsot fixity.	D.W. Scholl	US	10/88
225/E Suppl.	Plate-Reconstr.: Bering Sea	D.W. Scholl & al.	US	10/88
317/E Rev.	Northern Cascadian Subduction Zone	R.D.Hyndman & al.	CAN	12/88
318/E Rev.	Chile Margin Triple Junction	S.C.Cande & al	US	1/89
319/E Rev.	An extinct hydrotherm. syst., East Galapagos	M.R. Perfit & al	US/CAN	2/89
320/A	High Northern latitude paleoceano. & paleoclim.	E. Jansen & al	NOR/SWED.	3/89
321/E	The EPR ridge crest near 9°40' N	D.J. Fornari & al	US	3/89
322/E	Ontong Java Plateau-pipelike structures.	P.H. Nixon	UK	3/89
323/A	Gibraltar Arc	M.C. Comas & al	CONSOR	4/89
324/A	Tecton. evol. of W. & E. Mediterr. since Mesozoic	P. Casero & al.	IT/G	4/89
142/E Rev.	The Ontong Java Plateau	L. Mayer & al.	CAN/US/UK	4/89
325/E	High temp. hydrother. site N. Juan de Fuca Ridge	H.P. Johnson & al	US/CAN/UK	5/89
326/A	Continenetal margin of Northwest Morocco	K. Hinz & al	G	5/89
327/A	Argentine continental rise	K. Hinz & al	G/ARG	5/89
203/E Rev.	Cretaceous guyots in the Northwest Pacific	E. L. Winterer & al	US	5/89
328/A	Continental margin of East Greenland	K. Hinz & al	G	6/89
329/A Rev.	Paleocommunication between N & S Atlantic	J.P. Herbin & al.	FR	7/89
330/A	Mediterranean ridge, accretionary prism	M.B. Cita & al.	I/G	7/89
331/A	"Zero-age" drilling: Aegir ridge	R.B. Whitmarsh & al.	UK/G/FR	7/89

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332/A	Florida escarpment drilling transect	C.K. Paull & al.	US	7/89
333/A	Tectonic and magmatic evolution: Carribean sea	B.Mercier de Lepinay &al.	FR/US	7/89
334/A	The Galicia margin new challenge	G. Boillot & al.	FR/SP	7/89
335/E Rev.	Drowned atolls of the Marshall Islands.	S.O. Schlanger & al.	US	7/89
336/A	Artic to north Atantic gateways	J. Thiede	G	7/89
337/D	To test the sedim. architect. Exxon sea-level curve	R.M. Carter & al.	A/NZ/US	7/89
338/D	Neogene sea-level fluctuations: NE Australia	C.J. Pigram & al.	A	8/89
339/A	Drilling transects of the Benguela current	L. Diester-Haass & al.	G/US	8/89
340/D	Evolution of foreland basins: N. Australia	M. Apthorpe & al.	A	8/89
341/A	Global climatic change-Holocene	J.P.M. Syvitski	CAN	8/89
342/A	The Barbados accretionary prism	R.C. Speed & al.	US/UK/FR	8/89
343/A	Drill in window Cret. volc. form. Caribbean	A. Mauffret & al.	FR	8/89
344/A	Western N. Atl. Jurassic magnetic quiet zone	R.E. Sheridan	US	8/89
345/A	Sea level and paleoclim. West Florida margin	J.E. Joyce & al.	US	8/89
346/A Rev.	The Equatorial Atlantic transform margin	J.Mascle & al.	FR	8/89
347/A	Late Cenozoic paleocean., S.Equat.Atlantic	G. Wefer & al.	G/US	8/89
348/A	Upper Paleoc. to Neog. sequence: mid Atl. margin	K.G. Miller & al.	US	8/89
349/A	Clastic apron of Gran Canaria.	H.-U. Schmincke & al.	G/US/UK	8/89
350/E	Gorda deformation zone off N. Calif.	M. Lyle & al.	US	9/89
351/C	Bransfield Strait	D.C. Storey & al.	UK/US/G	9/89
352/E	Drilling into Layer 3, Mathemat. Ridge	D.S. Stakes & al.	US	9/89
353/C Rev.	Antarctic Peninsula, Pac. margin	P.F. Barker & al.	UK	9/89
354/A	Angola/Namibia upwelling system	G. Wefer & al.	G/US	9/89
355/E	Formation of a gaz hydrate	R. von Huene & al.	G/US	9/89
271/E Rev/2	APC coring seamounts off California.	J. Barron	US	9/89
233/E Rev/2	Oregon accretionary complex	L.D. Kulm & al.	US/G	9/89
356/A	Denmark Str.,Greenl. Scotl.&Jan Mayen ridges	P.P. Smolka & al.	G	9/89
357/E Rev.	East Pacific Rise near 12°50'	R. Hékinian & al.	FR/US	10/89
286/E Add.	Layer 2/3 transition at hole 504B	K. Becker	US	10/89
355/E Rev.	Formation of a gaz hydrate	R. von Huene & al.	G/US	10/89
221/E Add.	Eastern Equatorial Pacific Neogene	N.G. Pisias & al.	US	11/89
317/E Add.	Northern Cascadia subduction zone	R.D. Hyndman & al.	CAN	11/89
358/A	To drill a transect at the Vøring margin	O. Eldholm & al.	NOR	11/89
359/A	North Atlan. conjug. passive margin	B. Tuchloke & al.	US/CAN/FR	11/89
360/D	Valu Fa Ridge (Southern Lau Basin)	U. von Stackelberg & al	CONSOR.	12/89
361/A	Active Hydrotherm. Mid-Atlantic Ridge	G. Thompson & al.	US /UK	1/90
362/E Rev.	Chile margin triple junction	S.C. Cande & al.	US/UK	1/90
363/A	Plume volcanism: Grand Banks - Iberia separation	B.E. Tucholke & al.	US/CAN	1/90
364/A	Thrust units of contin. basement: central Mediter.	R. Sartori & al.	I/FR	1/90
330/A Add.	Mediterranean ridge, accretionary prism	M. Cita & al.	I/G	1/90
365/A	Conjugate passive margin - N.Atlantic	J. Austin & al.	US/CAN/FR	1/90
366/A	Labrador - Greenland (Preliminary)	M.H. Salisbury	CAN	1/90
367/C	Cool water carbonate margin: S. Australia	N.P. James	CAN	2/90
368/E	Jurassic Pacific crust: return to 801C	R.L. Larson & al.	US/UK	2/90
369/A	A deep mantle section in the Mark area	C. Mevel & al.	FR	2/90
370/A	Magmatic proces. & natur. tracers: Oceanogr. FZ	H.J.B. Dick & al.	US/CAN	2/90
371/E	To drill the Nova-Canton Trough	K. Becker & al.	US	2/90
372/A	Water circul. & vertical chemi. gradients Cenozoic	R. Zahn	CAN	2/90
373/E	Revisiting Site 505	M.D. Zoback & al.	US	3/90
374/A	Mantle heterogeneity Oceano. Fracture Zone	H.J.B. Dick & al.	US	3/90

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JOIDES No	Title	Proponents	Country	Date
375/E	Deep crustal drilling: Hess Deep	H.J.B. Dick & al.	US	3/90
376/A	Layer 2/3 boundary: Vema fracture zone	J.M. Auzende & al.	FR	3/90
377/E Rev.	Global network ocean floor seismometers	G.M. Purdy & al.	US	3/90
378/A Rev.	Barbados accretionary wedge	R.C. Speed & al.	US/UK/FR	3/90
379/A	Scientific drilling Mediterranean Sea	J. Mascle	FR	3/90
380/A Rev.	Clastic apron of Gran Canaria	H.-U. Schmincke & al.	G	3/90
381/A	Continental shelf and slope of Argentina	B.T. Huber	US	3/90