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JOIDES PLANNING COMMITTEE SPRING MEETING
23 - 25 April, 1991
University of Rhode Island, Graduate School of Oceanography
Narragansett, Rhode Island

AGENDA

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Tuesday, 23 April 1991 (9:00 AM)

Wednesday, 24 April 1991 (8:30 AM)

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Additional Attachments

As of April 12, 1991

JOIDES MEETING SCHEDULE

Date	Place	Committee/Panel
1991		
23-25 April	Narragansett, RI	PCOM
14-15 May	College Station, TX	PPSP
04-06 June	Palisades,NY	SGPP
04-06 June*	Palisades, NY	DMP
08-09 July*	San Diego, CA	TEDCOM
09-11 July	San Diego, CA	EXCOM
16-28 July	Cardiff, Wales	ex-IOP & Co-Chiefs
20-22 August	Hannover, FRG	PCOM
03-05 September*	Tokyo, JAPAN	SSP
01-03 October*	Yamagata, JAPAN	OHP
09-11 October*	Cyprus	LITHP
09-11 October*	Cyprus	TECP
01-03 November*	Scripps, CA	SL-WG
03 December	Austin, TX	Panel Chairpersons
04-07 December	Austin, TX	PCOM
1992		
14-16 January	Bonn, Germany	EXCOM
21-23 April	Corvallis, OR	PCOM
Summer	Victoria, BC	PCOM
Annual Meeting	Palisades, NY	PCOM

* Meeting not yet formally requested and/or approved

JOIDES Resolution Operations Schedule

Leg	Program	Cruise Dates	Days: Transit	Days: On Site	Days: Total	In Port
135	Lau Basin	22 Dec. '90-28 Feb. '91			68	Honolulu, 28 Feb. -02 Mar. '91
136	OSN-1	03 Mar.-20 Mar. '91	1	16	17	Honolulu, 20 Mar. '91 (Scientific Party Change)
137	Hole 504B	21 Mar.-01 May '91	19	22	41	Panama, 01-05 May '91
138	E. Equatorial Pacific	06 May-05 July '91	22	38	60	San Diego, 05-09 July '91
139	Sedimented Ridges I	10 July-11 Sept. '91	6	57	63	Victoria, 11-15 Sept. '91
140	504B*/Hess Deep	16 Sep.-12 Nov. '91	18	39	57	Panama, 12-16 Nov. '91
141	Chile Triple Junction	17 Nov.-13 Jan. '92	18	39	57	Valparaiso, 13-17 Jan. '92
142	Engineering, EPR	18 Jan.-19 Mar. '92	25	36	61	Honolulu, 19-23 Mar. '92
143	Atolls & Guyots A	24 Mar.-19 May '92	18	38	56	Guam, 19-23 May '92
			(12)	(43)	(55)	(Majuro)***
144	Atolls & Guyots B	24 May-19 July '92	16	40	56	Honolulu, 29-23 July '92
			(12)	(45)	(57)	(Tokyo)***
145	North Pacific Transect	24 July-21 Sept. '92	23	36	59	Seattle, 21-25 Sept. '92
146	Cascadia	26 Sept.-21 Nov. '92	6	50	56	San Diego, 21-25 Nov. '92
147	Engineering EPR**/Hess Deep	26 Nov. '92-21 Jan. '93	14	42	56	Panama Into the Antlantic

* If cleaning operations are successful on Leg 137

** If DCS Phase III System is ready

*** Added by JOIDES Office for discussion at meeting

JOIDES PLANNING COMMITTEE SPRING MEETING
23 - 25 April, 1991
University of Rhode Island, Graduate School of Oceanography
Narragansett, Rhode Island

AGENDA NOTES

Tuesday, 23 April 1991 (9:00 AM)

Item A.
Welcome and Introduction

1. Welcome and comments about meeting logistics (M. Leinen).

2. Introduction of PCOM members, liaisons and guests.

Item B.
Approval of Minutes

1. The attached revised draft minutes of the 28 November - 1 December 1990 PCOM Meeting at Kailua-Kona, Hawaii include corrections received at the JOIDES Office through 10 April.

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

Item C.
Approval of Agenda

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

The main purpose for the Spring Meeting is <u>to plan the general direction of the drilling vessel for the next four years</u> (see Agenda **Items J.** and **K.**).

Other important, but subordinate, purposes are: to decide matters related to various reports from liaisons to PCOM, from PCOM liaisons to panels and from new DPGs and WGs (see Agenda **Items D., F., and G.**), to make any adjustments in the planning structure necessary to prepare for the next four years in general and for Fiscal Year 1993 (FY93) in particular (~ late January, 1993 - late September, 1993; see Agenda **Item L.**), to hear recent scientific results from drilling off Vanuatu (Leg 134), in the Lau Basin (Leg 135), and off Hawaii (OSN-1 pilot hole, Leg 136) (Agenda **Items E., H., and I.**), and to conduct routine PCOM business (Agenda **Items M.-Q.**).

In oral presentations concerning their activities over the past year, PCOM liaisons should answer any questions addressed to them by PCOM previously, stress points that bear on planning for the intermediate future (FY92 or FY93), and raise any issues that need to be resolved at this meeting. Details can be left to the panel minutes (appended as attachments to this Agenda Book, if received at the JOIDES Office by 4/11/91). *(Note: Immediately following these reports, copies of any overheads used should be given to JOIDES Office personnel for inclusion as appendices to the minutes of this meeting.)*

a. Tuesday: Reports by liaisons to PCOM and PCOM liaisons to service panels, technical committees, and thematic panels (except for global rankings of scientific programs), and reports on meetings of the Budget Committee (BCOM), Detailed Planning Groups (DPGs) and the Sea Level Working Group (SL-WG). Scientific summaries of recent results from Leg 134 will also be presented. All parties are urged to keep their reports and related discussions to ~20-30 minutes, without sacrificing the charge to reporters as stipulated above. If/when complicated issues arise, time will be made available later for further discussion as feasible/appropriate (probably under Agenda **Item O.**).

b. Wednesday: To start the day, summaries of scientific results from Leg 135 and Leg 136 engineering operations and results will be presented. Global ranking of scientific programs by the thematic panels will then be discussed, leading to setting the general direction of the drilling vessel for the next four years, i.e., to spring 1995. Preparation for detailed planning for FY93 will then be addressed, including a discussion of DCS and non-DCS engineering priorities by subcontractors and the need for any new DPGs and WGs.

c. Thursday: Routine PCOM affairs, personnel decisions, and any matters deferred from earlier in the week. Under Other Business (Agenda **Item Q.**), potential PCOM action items derived from JOIDES Office perusal of recent panel minutes, reports and correspondence are listed. Other items for discussion may be brought forward at the outset of the meeting, or may arise during the meeting. They will be added under New Business (Agenda **Item O.**)

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

Item D.
ODP Reports by Liaisons to PCOM

1. EXCOM (J. Austin, liaison).

EXCOM has not met since before the last PCOM meeting. Since then, the USSR has joined ODP. A MOU for Soviet participation during the period 1991 - 1993 was signed by Frederick M. Bernthal, acting director of NSF, on February 5, dictating that official Soviet participation will begin on May 1. A reciprocal signing by Academician G.I. Marchuk, President of the Academy of Sciences of the USSR, took place later in February. (Details are contained in selected correspondence included with this Agenda Book.) A delegation composed of NSF staff, representatives from the Science Operator, and selected JOIDES and JOI representatives anticipate visiting Moscow sometime in May.

2. NSF (B. Malfait, liaison).

- Resource issues and budget status.
- U.S. science activities.
- Other information.
- The crystal ball: planning for renewal (D. Heinrichs, ODP Council)

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

- Status of the FY92 Program Plan and budget.
- Status of liaison groups.
- Status of high-temperature tools.
- Other information.

4. BCOM (R. Moberly for J. Austin, who was at sea).

The Budget Committee met on 14-15 March at JOI, Inc. in Washington, D.C. Final minutes of that meeting are included with this Agenda Book. BCOM has made a recommendation to PCOM to examine non-DCS engineering priorities: "PCOM should evaluate each in terms of the advice of its panels and the schedules presented by TAMU and consider which should be terminated and which should be identified for rapid development." That discussion will take place under Agenda **Item L.**

(Approximately 10:15 AM) Coffee Break

5. Science Operator (T. Francis, liaison; not to include status of non-DCS engineering and technical developments, Agenda **Item L.**).

   - Operations of the *D/V JOIDES Resolution* since the last PCOM meeting: Leg 135 (Lau Basin), Leg 136 (OSN-1) and Leg 137 (Hole 504B, in progress).
   - Near-term planning, 1991: Leg 138 (E. Equatorial Pacific), Leg 139 (Sedimented Ridges), Leg 140 (504B/Hess Deep), Leg 141 (Chile Triple Junction).
   - Adjustments to 1992 Operations Schedule.
   - Leg Staffing.
   - Publications.

6. Wireline Logging (R. Jarrard, liaison; not to include status of engineering and technical developments, Agenda **Item L.**).
   - Recent operations, performance, and results.
   - Other comments.

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

Item E.
Report of Recent Drilling Leg: 134 (Vanuatu) (G. Green)

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

Item F.
JOIDES Reports by PCOM Liaisons
(Excluding: (a) membership issues, which will be covered on Thursday, and (b) for thematic panels, details of rankings of programs, which will be covered on Wednesday morning.)

1. DMP (K. Becker, at sea; R. Jarrard will give a short summary).

DMP met 6-8 February in College Station. An important focus of the meeting was to consider ODP's past performance in tectonically active regions (specifically convergent margins) and to make recommendations on ways to improve borehole stability at Chile Triple Junction (Leg 141) and Cascadia (146). In order to publicize the activities of this "mini-workshop", the JOIDES Office will publish the results of the meeting (DMP recommendations 91/8 and 91/9) in the next *JOIDES Journal*.

PCOM should consider DMP's recommendations 91/1 (re: fluid sampling) and 91/2 (re: GEOPROPS) in the context of the discussion which will take place on non-DCS engineering priorities (Agenda **Item L.**).

2. SMP (M. Leinen/M. Cita-Sironi).

SMP met 19-21 March in College Station, including a joint session with IHP. Written questions to the panel were submitted by the PCOM liaison, although no liaison attended the meeting itself. Full panel minutes were not received in time to be included with this Agenda Book, but the panel chairperson has submitted an executive summary. Issues discussed included a review of each of the shipboard laboratories, implementation of core-log data integration (with IHP) and levels of shipboard staffing necessary for adequate technical support.

PCOM may want to consider further the issue of shipboard staffing (which is linked to proper implementation of SMP's core-log data integration initiative) under Agenda **Item Q.**

3. IHP (Y. Lancelot).

IHP met 18-20 March at College Station, including a joint session with SMP on the subject of core-log data integration. A PCOM liaison did not attend, but the chairperson asks that the designated liaison be prepared to summarize the results of the meeting. Minutes are included with this Agenda Book.

4. SSP (J. Watkins).

SSP met 26-28 March in College Station. During this meeting, the PCOM chairperson was contacted both by the PCOM liaison and the SSP chairperson regarding the panel's continuing concern over the immature state of site selection at Hess Deep, particularly if HD should need to be drilled as Leg 140. 'There was strong condemnation of [PCOM's] actions in the light of JOIDES' general philosophy that ODP is beyond the exploratory phase and now aims to test well-constrained models with drilling.' The PCOM chairperson has been informed by NSF that additional MCS acquisition proposed for Hess Deep has not been funded. However, the PCOM chairperson has also been assured by H. Dick, designated 140 co-chief and HD proponent, that an adequate data synthesis and site selection for HD will be complete by July. (See also Agenda **Item F. 10.**)

5. PPSP (J. Austin).

PPSP has not met since the last meeting of PCOM. The JOIDES Office queried M. Ball, the chairperson, for input to this meeting, and he responded that PPSP has nothing to report. PPSP's next meeting is scheduled for 14-15 May in College Station.

6. TEDCOM (J. Natland).

TEDCOM has not met since the last meeting of PCOM. The JOIDES Office queried C. Sparks for input to this meeting, and he responded that TEDCOM is still expecting input from relevant thematic panels (TECP, LITHP, and SGPP) on potential deep-drilling targets. TECP has already provided some input to TEDCOM and ODP-TAMU for non-volcanic rifted margin sites, and additional sites are being prepared for volcanic rifted margins and accretionary prisms (see TECP minutes). LITHP considered this issue at its March meeting and will be providing input soon. The JOIDES Office has learned that SGPP will consider specific deep-drilling targets at its next meeting (tentatively scheduled for 4-6 June at LDGO).

TEDCOM's next scheduled meeting is 8-9 July in Los Angeles, to coincide with the port call of the drillship in San Diego at the conclusion of Leg 138.

7. LITHP (J. Malpas).

LITHP met 14-16 March at Scripps. They continue to support emphatically the immediate formation of an Offset Drilling Working Group (see Agenda **Item L. 2.**), and have also endorsed the DMP recommendation (91/1) to examine the question of downhole fluid sampling with a WG (see Agenda **Item L. 2.**)

8. OHP (R. Duncan).

OHP met 28 February-2 March in Chapel Hill. The panel spent much of its time developing a viable drilling plan for the North Pacific Transect, Leg 145 (see also Agenda **Item M. 2.**).

9. SGPP (R. Moberly).

SGPP met 5-7 March at College Station. The panel made strong statements in support of continued engineering developments: a comprehensive PCS system, wireline packer water sampling capability, and sand sampling using the VPC and the break-away piston head. PCOM will take up these topics under Agenda **Item L. 1.**

A meeting of SGPP with invited guests also considered the broad issue of understanding gas hydrates through scientific ocean drilling. Participants suggested that 'a dedicated gas hydrate leg be planned and drilled similar to the one previously proposed for the Peru margin...' Results of this 'mini-workshop' will be publicized in the next issue of the *JOIDES Journal* (early summer, 1991) and also incorporated into the update of safety guidelines being prepared by PPSP.

10. TECP (B. Tucholke).

TECP met 21-23 March in Davis. The panel is drafting guidelines for proposal preparation, submission and review to help proponents incorporate TECP interests. The JOIDES Office will publicize aspects of these documents in the next issue of the *JOIDES Journal*.

The panel is considering RFPs ("requests for proposals") for two TECP themes: sheared (translational) margins and oblique convergent margins.

TECP is concerned about the number of days being devoted to science during Leg 141, Chile Triple Junction. They suggest that the leg needs at least 4 more days to accomplish its stated scientific objectives. PCOM will take up this issue during Agenda **Item M.** Like SSP, TECP is concerned about the status of site selection and overall data coverage at Hess Deep, particularly in support of TECP objectives (see report by Karson at the end of the minutes). Depending upon input from ODP/TAMU about progress at 504B, PCOM may take up a discussion of siting at Hess Deep under Agenda **Item M.**

TECP endorses the formation of an Offset Drilling Working Group advocated by LITHP (see Agenda **Item L. 2.**).

11. ACTION Identify action items from afternoon reports of PCOM liaisons; take action or postpone (probably to **Item O.**) as appropriate.

(Approximately 3:30 PM) Coffee Break

Item G.
Special Reports that will Influence Planning of the Immediate Future

1. A&G-DPG (J. Watkins/D. Rea)

The Atolls and Guyots Detailed Planning Group met 27-28 February in Ann Arbor, Michigan. A report of the meeting is included with this Agenda Book.

D. Rea has asked the PCOM chairperson to bring up an issue which impeded the progress of the A&G-DPG: representation by liaisons from panels/partner nations without the requisite expertise to help the DPG do its mandated work. Rea recommends keeping the size of DPGs small enough so that they can can complete their work expeditiously, even if 'oversight' by the JOIDES advisory structure is reduced. PCOM will discuss this issue under Agenda **Item L.**

2. NAAG-DPG (M. Leinen)

The North Atlantic Arctic Gateways Detailed Planning Group met 18-20 February at LDGO. The PCOM liaison will present its deliberations and results, in the absence of the DPG chairperson, who could not attend this meeting of PCOM. A synopsis of the DPG meeting is included with this Agenda Book, and a copy of the drilling prospectus will be distributed at the meeting. Preliminary copies of this prospectus (15 sites, 2 legs) were available to OHP for its late February-early March meeting and to SSP for its March meeting (e.g., see NAAG-DPG drilling prospectus summary in the SSP minutes).

3. NARM-DPG (B. Tucholke)

The North Atlantic Rifted Margins Detailed Planning Group met 25-27 February at WHOI. The PCOM liaison will present initial deliberations and results of this DPG, which anticipates a second (and final) meeting during

August 1991. A draft preliminary report was not available for incorporation with this Agenda Book, but will be distributed at the meeting. The DPG chairperson, Hans Christian Larsen, will be available to present the DPG's final report to PCOM, either at the August meeting in Germany or at the Annual Meeting with Panel Chairs in December in Austin.

4. SL-WG (J. Watkins/P. Crevello)

The Sea Level Working Group met 2-3 March at Littleton, Colorado (home of Marathon Oil Company, the chairperson's employer). The first meeting dealt with a review of mandate/formulation of mission, discussion of principal objectives, and setting an agenda for activities and future meetings. The SL-WG also generated an outline of a position paper for eventual submission to PCOM. A preliminary report is included with this Agenda Book, but a more complete version should be available for distribution at the meeting.

The next tentatively scheduled meeting of SL-WG is in November.

5. ACTION Identify action items from afternoon reports of PCOM liaisons/DPG-WG chairpersons; take action or postpone (probably to **Item O.**) as appropriate.

Wednesday, 24 April 1991 (8:30 AM)

Item H.
Report of Recent Drilling Leg: 135 (Lau Basin) (J. Hawkins)

Item I.
Report of Recent Drilling Leg: 136 (OSN-1 off Hawaii) and related engineering developments (A. Dziewonski/T. Francis)

Item J.
Thematic Rankings of Programs

Thematic panel rankings and statements of interest in individual programs are given in each panel's minutes included with this Agenda Book. The accompanying summary table prepared by the JOIDES Office compares the rankings of the four panels. *(A map prepared by the JOIDES Office*

Global Ranking of Proposals by Thematic Panels, April 1991

Subdivision at ranks 5, 10 and 15 correlates with categories 3, 2, 1 and 0 on histograms of global map.

Rank	LITHP	OHP	SGPP	TECP	Map histo-grams
1	387-Rev Hess Deep	NAAG-DPG N Atl./Arctic gateways	355-Rev2 Gas hydrate	NARM-DPG N Atl. rifted margins	
2	361---- TAG hydro.	348---- New Jersey sea level	391---- Med. sapropels	323-Rev Alboran Basin/gateway 330---- Med. Ridge	
3	EPR-DPG East Pacific Rise II	339---- Benguela Current 354---- SE Atl. upwelling	SR-DPG Sedimented Ridges II	362-Rev2 Chile Triple Junction II	3
4	NARM-DPG N Atl. rifted margins (volcanic: 392-396)	388---- Ceara Rise	348---- New Jersey sea level	346-Rev Eq. Atl. transform	
5	SR-DPG Sedimented Ridges II	253---- Shatsky R. black shales	380-Rev VICAP Gran Canaria	GENERIC Hess Deep II (tectonic)	
6	376---- Vema FZ: layer 2/3 382---- Vema FZ: deep crust	347---- South-eq. Atl. paleo.	233-Rev3 Oregon acc. complex	343---- Caribbean crust	
7	369---- MARK deep mantle	Bering Sea (Pac. Prosp.) Bering Sea history 390---- Shirshov Ridge	354---- SE Atl. upwelling	265---- Woodlark Basin	2
8	NARM-DPG N Atl. rifted margins (non-volc.: 334, 365)	386-Rev California margin	059-Rev2 Sediment instability	378-Rev Barbados acc. wedge	
9	325---- Endeavour Ridge	345---- West Florida sea level	EPR-DPG East Pacific Rise II	334-Rev Galicia margin	
10	142-Rev Ontong Java Plateau	NARM-DPG N Atl. rifted margins	337---- New Zealand sea level	363---- GB-Iberia plume volc.	
11	368---- Hole 801C Return	296-Rev Ross Sea	360---- Valu Fa hydro.	GENERIC Slow offset drilling	
12	300---- 735B: layer 3/mantle	313---- Eq. Atl. pathways	388---- Ceara Rise	340---- N Australian margin	
13	374---- Oceanographer FZ		368---- Hole 801C Return	GENERIC Red Sea, Gulf of Aden	1
14	362-Rev2 Chile Triple Junction II		361---- TAG hydro.	Cascadia-DPG Cascadia Margin II	
15	252---- Loihi Seamount		340---- N Australian margin	379---- Med. drilling (Tyr. Sea)	
16	290---- Juan de Fuca axial smt.		330---- Med. Ridge	392---- Labrador Sea volc.	
17	379---- Med. drilling		378-Rev Barbados acc. wedge	333---- Cayman Trough	
18	323-Rev Alboran Basin/gateway		367---- S Australia margin	373---- Site 505 Return	0
19	373---- Site 505 Return		275-Rev Gulf of California	327---- Argentine cont. rise	
20	360---- Valu Fa hydro.		372---- N Atl. paleo.	367---- S Australia margin	
Plus	280-Rev; 331; 267; 319-Rev; 291; 390; 352; 333; 343				

Listing* of Proposals Ranked** by Thematic Panels During Early 1991 Meetings

* Sorted by 'Date Received at the JOIDES Office'; ** Priorities 1 - 20 of each panel

Proposal	Abbreviated Title	Contact	Priorities			
			LITHP	OHP	SGPP	TECP
252----	Loihi Seamount	Staudigel, H.	15	-	-	-
253----	Black shales in ancestral Pacific, Shatsky Rise	Sliter, W.V.	-	5	-	-
265----	Western Woodlark Basin	Scott, S.D.	-	-	-	7
290----	Deep drilling on axial seamount, Juan de Fuca Ridge	Johnson, H.P.	16	-	-	-
296-Rev	Drilling the Ross Sea, Antarctica	Cooper, A.K.	-	11	-	-
300----	Deep crustal drilling, Site 735B, SW Indian Ridge	Dick, H.J.B.	12	-	-	-
059-Rev2	Cont. margin sed. instability, drilling adjacent turbidites	Weaver, P.P.E.	-	-	8	-
313----	Major oceanographic pathway, equatorial Atlantic	Jones, E.J.W.	-	12	-	-
275-Rev	Drilling the Gulf of California	Simoneit, B.R.T.	-	-	19	-
142-Rev	Ontong Java Plateau	Mayer, L.	10	-	-	-
325----	High-T hydrothermal site, Endeavour Ridge	Johnson, H.P.	9	-	-	-
327----	Argentine continental rise	Hinz, K.	-	-	-	19
SR-DPG	Sedimented Ridges, 2nd leg	Detrick, R.	5	-	3	-
330----	Accretionary prism and collision, Mediterranean Ridge	Cita-Sironi, M.B.	-	-	16	2
337----	Tests of Exxon sea-level curve, New Zealand	Carter, R.M.	-	-	10	-
333----	Evolution of pull-apart basin, Cayman Trough	Mann, P.	-	-	-	17
340----	Tectonic, climatic, oceano. change, N Australian margin	Symonds, P.	-	-	15	12
343----	Window of Cret. volcanic formation, Caribbean Zone	Mauffret, A.	-	-	-	6
339----	Paleoceanographic transects, Benguela Current	Meyers, P.A.	-	3	-	-
345----	Sea level and paleoclimate, W Florida margin	Joyce, J.E.	-	9	-	-
346-Rev	Drilling equatorial Atlantic transform margin	Mascle, J.	-	-	-	4
347----	L. Cenozoic paleoceanography, south-equatorial Atlantic	Wefer, G.	-	6	-	-
348----	Paleogene/Neogene stratigraphy, U.S. Atlanic margin	Miller, K.G.	-	2	4	-
354----	Late Cenozoic upwelling system, Angola/Namibia	Wefer, G.	-	3	7	-
360----	Hydrothermal activity and metallogenesis, Valu Fa Ridge	Von Stackelberg, U.	20	-	11	-
361----	Active hydroth. system, slow-spread ridge, MAR 26° N	Thompson, G.	2	-	14	-
363----	Plume volcanism and rift/drift, Grand Banks-Iberia	Tucholke, B.E.	-	-	-	10
367----	Cool water carbonate margin, southern Australia	James, N.P.	-	-	18	20
368----	Jurassic Pacific crust: A return to Hole 801C	Larson, R.L.	11	-	13	-
369----	Deep mantle section, Mark area	Mevel, C.	7	-	-	-
372----	Cenozoic circulation and chem. gradients, N Atlantic	Zahn, R.	-	-	20	-
373----	Stress, hydrol. circul. and heat flow, Site 505 revisited	Zoback, M.D.	19	-	-	18
374----	Mantle heterogeneity, Oceanographer FZ	Dick, H.J.B.	13	-	-	-
376----	Layer 2/3 (and crust/mantle) boundary, Vema FZ	Auzende, J.M.	6	-	-	-
379----	Scientific drilling in the Mediterranean Sea	Mascle, J.	17	-	-	15
EPR-DPG	East Pacific Rise, 2nd leg	Davis, E.E.	3	-	9	-
380-Rev	Volcanic island - clastic apron, Gran Canaria	Schmincke, H.U.	-	-	5	-
382----	Upper mantle - lower crustal uplifted section, Vema FZ	Bonatti, E.	6	-	-	-
378-Rev	Growth and fluids evol., Barbados accretionary wedge	Westbrook, G.K.	-	-	17	8
386-Rev	Paleoceanography and deformation, California margin	Lyle, M.	-	8	-	-
Cascadia-DPG	Cascadia Margin, 2nd leg	Cathles, L.M.	-	-	-	14
233-Rev3	Fluids and structure of acc. complex, central Oregon	Moore, J.C.	-	-	6	-
355-Rev2	Formation of a gas hydrate	Von Huene, R.	-	-	1	-
387-Rev	Deep drilling of fast-spread crust, Hess Deep	Gillis, K.	1	-	-	-
Bering Sea	Bering Sea history (Pacific Prospectus)	CEPAC	-	7	-	-
388----	Neogene deep water circ. and chemistry, Ceara Rise	Curry, W.B.	-	4	12	-
362-Rev2	Triple junction, southern Chile Trench	Cande, S.C.	14	-	-	3
390----	Drilling in the Shirshov ridge region	Milanovsky, V.E.	-	7	-	-
334-Rev	S reflector and ultramafic basement, Galicia margin	Boillot, G.	-	-	-	9
391----	Formation of sapropels, eastern Mediterranean	Zahn, R.	-	-	2	-
392----	Mantle plume origin, North Atlantic volcanic margins	Larsen, H.C.	-	-	-	16
323-Rev	Alboran basin and Atlantic-Mediterranean gateway	Comas, M.C.	18	-	-	2
NAAG-DPG	North Atlantic - Arctic gateways	Ruddiman, W.F.	-	1	-	-
NARM-DPG	North Atlantic rifted margins	Larsen, H.C.	4	10	-	1

summarizing the global prioritizations will be available at the meeting for all participants.)

Individual panel rankings and the means by which these rankings were achieved will be presented by PCOM liaisons to the thematic panels, but the JOIDES Office has excerpted details from the minutes as noted below.

1. LITHP (J. Malpas).

'LITHP identified 29 proposals that address high priority objectives and are of interest to the panel. No topic was included for which a proposal did not exist; hence, although a continuous section of oceanic crust remains a major goal, it could not be included in the rankings. In addition, it did not seem realistic to include it when the technology is unlikely to have advanced sufficiently to achieve such an objective in the time-frame for which the ranking was done.

Once the programs to be ranked had been identified, each panel member assigned their top ten priorities, awarding 10 points to their highest ranked program, 9 points to their second highest program, etc. Proponents on proposals were <u>not</u> permitted to include their own proposals in their rankings. This procedure was carried out with the understanding that, should ambiguities arise due to the variation in the number of panel members permitted to vote on each proposal, a second round of voting would be conducted; this proved unnecessary.'

The PCOM chairperson notes that for two of the seven themes identified by LITHP as being of high priority, no highly ranked proposal exists.

2. OHP (R. Duncan).

OHP ranking was undertaken in four steps: 1 - circulation of proposals to pertinent panel members for review prior to the meeting; 2 - discussion of each proposal at the meeting itself; 3 - assigning 'mature' (see OHP minutes, p. 21, for an explanation) proposals to an important OHP theme [detailed below]; and 4 - ranking proposals within each theme.

The themes identified by OHP as being of importance to them were: (1) 'low frequency global change/Mesozoic and Paleogene'; (2) 'high frequency global change/Neogene'; (3) 'upwelling/ productivity history'; (4) 'sea level history'; and (5) 'high latitude problems' (see OHP minutes, p. 22, for an explanation of this "theme").

Then, OHP ranked a total of 15 proposals into a list consisting of 12 spots. The panel used 'a series of votes in each of which the voting was between the highest-ranked proposal remaining in each theme. In the event of a tie between the first two in a voting round, the vote was re-taken between only the two proposals tied. All panel members voted, but if at any stage the number of votes separating the first and next proposal on the slate was small enough so that the result could have been affected by the vote of a proponent, the vote was re-taken with proponents abstaining. ...the panel judged that it was very fair...' PCOM may want to discuss this procedure with the PCOM liaison, to be sure that proponents did not have undue influence on OHP global rankings.

Unlike LITHP, all of OHP's themes are represented by highly-ranked programs.

3. SGPP (R. Moberly).

SGPP, after reviewing individual proposals, subdivided proposals according to the 5 themes developed in the SGPP white paper. A total of 32 proposals were then ranked 'by consensus' in one of those categories: (1) sea level; (2) materials cycling/mass balance/sediment architecture; (3) fluids; (4) hydrothermalism and metallogenesis; and (5) paleo-ocean chemistry.

The final ranking of 20 proposals/programs (see accompanying table) occurred by 'voting each time on top-ranked proposals in each of the five categories.' The SGPP top 20 includes: top 3 (of 5) from (1); top 2 (of 7) from (2); top 6 (of 9) from (3); top 5 (of 6) from (4); and top 4 (of 5) from (5).

Unlike LITHP but like OHP, all of SGPP's high-priority themes are represented by highly-ranked proposals.

4. TECP (B. Tucholke).

TECP began by discussing themes of importance to TECP (no priority order) in the context of submitted proposals and recent drilling results: (1) rifted margins (volcanic-rich, volcanic-poor); (2) sheared translational margins; (3) convergent margins; (4) divergent oceanic plate margins; (5) plateaus, microcontinents, aseismic ridges, anomalous basins (Caribbean, Scotia Sea); (6) driving forces, including stress, intraplate deformation; (7) collisional margins; and (8) plate history, sea level changes and origin of magnetic anomalies.

Global ranking was accomplished by listing outstanding thematic issues and/or proposals and then having each panel member rank 20 in order. Proponents did not vote on their own proposals and indicated on their ballots when and if they had such a potential conflict. Scores were then tallied, and averages computed by dividing total scores by the number voting minus the number of conflicts (see the minutes for details).

TECP also qualified their ranking by making an independent assessment of the feasibility of achieving ranked programs over the next four years (see the minutes). Therefore, that panel has ranked some 'generic' programs (i.e., of interest to TECP thematically but lacking feasibility for the intermediate future and/or without suitable proposal). Only 11 of their 20 ranked programs were viewed by TECP as being "achievable" before the spring of 1995.

(Approximately 10:15 AM) Coffee Break

Item K
Setting the General Direction of the Drilling Vessel to Spring 1995

Here PCOM should consider mainly the global rankings of scientific programs by the thematic panels, reviewed in Agenda **Item J.** above. *(A map showing the distribution of ranked programs as outlined in **Item J.** will be available for all PCOM members as an aid to discussion and decision-making.)*

During its deliberations, PCOM should also consider advice from its other panels, the Science Operator, and Borehole Research Group about such factors as:

- engineering preparedness.
- logging (and other tools) preparedness.
- status of site surveys.
- weather or clearance problems.

In this regard, PCOM should remember and be prepared for a following detailed discussion of DCS and non-DCS engineering priorities (included as Agenda **Item L.**) which will impact planning for FY93 and beyond. <u>The Agenda has been ordered in this way because the chairperson feels that PCOM must first decide its scientific priorities for the intermediate future before advising the Science Operator and BRG on engineering priorities to achieve those goals.</u>

PCOM should also consider:

- balance among scientific themes, both within panels and across panel lines.
- balance between extremes of drillship efficiency, i.e., (a) transiting from the highest-ranked program to the next-highest, in any ocean, as opposed to (b) picking up all ranked programs in one ocean before transiting to another.
- balance in temporal aspects, e.g., (a) the interval since the drillship was last used for the scientific interests of one part of the community, versus (b) commencement or continuation of long-term, multi-site programs that may chiefly concern one part of the community.
- objectives of COSOD I, COSOD II, and the Long Range Plan.

As in past years, 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 a general consensus before the formal motion(s). <u>The PCOM chairperson will insist that any motion be written before it is offered orally.</u>

The JOIDES Office suggests that the final motion be given in a form that breaks the drillship's route by either calendar or fiscal year, with the proximal part firmer than the distal part, for example:

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

(1) In the remainder of FY91, confirmed as is in the current Program Plan.

(2) In FY92, and beyond to January 1993, confirmed as is in the Program Plan approved at its November 1990 meeting in Kailua-Kona, Hawaii, through Leg 147, Engineering EPR (in the event that DCS Phase III is not ready, Hess Deep will be substituted), ending in Panama on or about 21 January 1993.

(3) In the remainder of FY93, in the North Atlantic. Program to be finalized in November 1991 at the Annual Meeting of PCOM with Panel Chairs.

(4) In late 1993 through April 1995, in the general direction of highly ranked proposals in the [...list one or more general areas of the ocean, for example, 'South Atlantic and Mediterranean, followed by Eastern Pacific'...].

PCOM reaffirms its stand that at its spring 1992 meeting, and at subsequent 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."

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

Item L
Preparation for Detailed Planning

1.*To Prepare for the FY93 Program Plan and Beyond*

- Preparations for Leg 142 and DCS Status Report (M. Storms, ODP/TAMU)
- Non-DCS Engineering Priorities (M. Storms/T. Francis)
- Priorities for Downhole Measurements (R. Jarrard)

The general purpose of this discussion is two-fold. On the one hand, PCOM must respond to BCOM (see Agenda **Item D. 4.** above) and be aware of fiscal and manpower limitations that necessarily restrict the pace of technology development (e.g., see DMP statements on the status of wireline/fluid sampling). Those constraints demand some form of prioritization of engineering effort. At the same time, and in the context of the four-year plan just decided upon (Agenda **Item K.**) and ODP's Long Range Plan, PCOM must remain cognizant of and support vigorously the design and fabrication of specific technologies to achieve high-priority scientific goals, as specified by its advisory panels (e.g., see SGPP minutes re: PCS, water and sand sampling).

The result of this discussion should be a motion detailing a prioritized list of engineering developments for transmission to the Science Operator and BRG/LDGO, which the PCOM chairperson proposes should be reviewed/ modified each year at this meeting of PCOM.

(Approximately 3:30 PM) Coffee Break

2. *New DPGs and WGs*

The NAAG-DPG and NARM-DPG have already met and the NARM-DPG is expecting to meet once more. These DPGs are both developing drilling programs that will form part of the FY93 Program Plan.

- Are any additional DPGs required?

For example, OHP has suggested formation of a Bering Sea DPG.

PCOM should address the need to:

- Establish any additional DPG(s) appropriate to prepare a prospectus for scientific drilling in FY93 (to include more than 5 or 6 legs in the general direction of the vessel).
- Name an appropriate chair (or chairs), then fill and charge the DPG(s).
- The meeting(s) and report(s) of the DPG must be completed so that the report(s) can be reviewed and commented upon by panels at their fall meetings, before the Annual Meeting of PCOM with Panel Chairs.

The SL-WG has met once and expects up to two more meetings over the next year.

- Are any additional WGs required?

LITHP has once again, and in the strongest possible terms, requested immediate formation of an Offset Drilling Working Group (OD-WG). TECP has also endorsed formation of such a group. LITHP formulated a mandate for the OD-WG and generated a list of candidate members at its October 1990 meeting. *(The JOIDES Office has that information in overhead form if PCOM decides to form an OD-WG at this meeting.)*

DMP (Recommendation 91/1) has also expressed the desire for a 'specialist WG' or 'workshop' to identify 'the best available options for downhole fluid sampling in ODP-type situations.' LITHP has endorsed this suggestion. PCOM should decide how to accommodate this pressing need, other than through meetings of DMP or add-ons to scheduled DMP meetings.

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

Before adjournment of this meeting, PCOM should also move to disband and to thank formally members of current DPGs whose work PCOM considers complete.

3. *Representation at DPG meetings*

Deferred from Agenda **Item G. 1.** PCOM should discuss the issue of optimum size/level of expertise of both current and future DPGs, with a view to developing a consensus which might form the basis for modifying the membership portion of the current DPG mandate, reproduced below:

PCOM chooses DPG members for their expertise and experience with respect to the assigned thematic topics and in regions where these topics can be addressed. Members are recommended by the thematic panels and by PCOM and are appointed by PCOM or by the PCOM Chairman if necessary. The chairmen are appointed by PCOM.

The DPGs are composed of a number of members from U.S. institutions, and should maintain full representation, if possible, from the non-U.S. JOIDES institutions. A maximum number of 16 members is suggested.

Active DPGs meet at the request of PCOM as frequently as required by ship scheduling and routing. PCOM establishes liaison between DPGs and thematic panels by the appointment of non-voting liaisons.

Thursday, 25 April 1991 (8:30 AM)

Item M
Old Business; Continuing Issues

1. FY92 Program Plan

-Leg 140

If this leg is Hess Deep, PCOM should discuss continuing SSP and TECP concerns about the present state of site selection. PCOM must encourage all cognizant parties to work toward a viable data synthesis as quickly as possible.

-Leg 141

TECP has suggested that this leg needs at least 4 more days for science to achieve the stated scientific objectives. PCOM will see that the leg as scheduled already is 57 days long. TECP has suggested that ODP-TAMU examine port-calls (Panama/Valparaiso) to see if transit time for this leg can be reduced.

PCOM should examine this issue and make a recommendation to the Science Operator.

-Leg 142

Since the last meeting of PCOM, there has been considerable discussion among proponents, co-chiefs, ODP/TAMU engineers, panel chairs and the JOIDES Office about detailed siting of EPR/DCS engineering operations. PCOM will remember that the EPR-DPG recommended an off-axis site (EPR-1) for Leg 142 operations. New information, as a result of a geophysical survey to the area led by M. Purdy/G. Fryer early this year, indicates that rubble thickness increases away from the ridge crest, suggesting that the on-axis site (EPR-2) might better accommodate the leg's primary purpose: to acquire additional coring experience with Phase II of the DCS.

The PCOM chairperson has already polled PCOM members on this issue, and senses little opposition to the siting change. LITHP also supports the change (see their minutes). Nonetheless, given the importance of this leg to the future of DCS development and operations, the chairperson would like additional PCOM discussion at this meeting, and a motion reflecting PCOM's stance to guide co-chiefs and ODP/TAMU engineers in Leg 142 prospectus preparation.

-Legs 143/144/145

Both the A&G DPG and the OHP have suggested port-call changes to maximize scientific return during Legs 143, 144 and 145. PCOM will remember that ODP/TAMU's suggested port of call between legs 143 and 144 was Guam. The A&G DPG would like to change this to Majuro, if the drillship can be accommodated there. The original port call at the conclusion of Leg 144 was Honolulu, but both A&G-DPG and OHP strongly argue for Tokyo/Yokohama, as a Japanese port-call increases on-site time for both legs 144 and 145. This Agenda Book contains a letter from the Science Operator to the chairperson of the A&G-DPG explaining the reasons why a Japanese port-call is not desirable.

PCOM should examine this issue and make a recommendation to the Science Operator.

2. ACTION Identification of additional action items following discussions. Some may be deferred to Agenda **Item O.**

Item N
Membership and Personnel Actions

(Overhead projections will be used at the meeting. The JOIDES Office will also have information about all proposed new panel members, if supplied by panel chairs in time for the meeting.)

Panel Chair and Membership Changes

- DMP

B. Carson (U.S.) is rotating off. Three nominees to replace him are being contacted by Worthington; their names will be forwarded to the JOIDES Office once he has ascertained their willingness to serve. The PCOM chairperson will seek PCOM approval for Carson's replacement through the mails before DMP's next expected meeting (June/LDGO). For Germany, H. Villinger is being replaced by H. Draxler (KTB).

- SMP

I. Gibson, member of this panel and liaison to IHP, has been nominated to be the new chair of IHP. If PCOM endorses this recommendation (see IHP below), a new member of SMP is desirable. That individual might also serve as IHP liaison. A joint SMP/IHP subcommittee consisting of the SMP chairperson, I. Gibson, and M. Loughridge has nominated Ronald Chaney (Humboldt State University, U.S.) to the panel unanimously.

- IHP

T. Moore has finally succeeded in convincing both the members of his panel and the PCOM chairperson of his need to rotate off as chairperson. The panel has nominated I. Gibson (Univ. of Waterloo, Ontario, Canada) to replace him, and Gibson is willing to become the new chairperson. T. Moore has indicated that he will remain on the panel (reluctantly) for one or two more meetings to smooth the transition. PCOM must endorse this change, and the chairperson will ask that PCOM express its gratitude to Moore for a job well done with a written statement to be included in the minutes.

- SSP

No action requested.

- PPSP

No action requested.

- TEDCOM

C. Sparks has indicated that a new ESF representative is needed, as H. Strand has gone off the panel. Sparks is endeavoring to find a replacement from Iceland with high-temperature drilling experience, as per PCOM's suggestion at the Annual Meeting. No action required at present.

• LITHP

M. Perfit is rotating off. In an attempt to augment its expertise in the geology and geochemistry of lower crust-upper mantle, LITHP has unanimously nominated S. Bloomer (Boston University, U.S.) to replace Perfit. Bloomer is willing to serve.

• OHP

No action requested.

• SGPP

No action requested.

• TECP

No action requested.

(Approximately 10:15 AM) Coffee Break

PCOM Membership and Liaison Work

• Panel meetings, before PCOM's August meeting, that will require PCOM liaisons are:

EXCOM, in San Diego, July 9-11
DMP, at LDGO (with SGPP), June 4-6
PPSP, at College Station, 14-15 May
TEDCOM, in San Diego, July 8-9
SGPP, at LDGO (with DMP), June 4-6

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

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

PCOM Liaisons to DPGs and WGs:

M. Leinen	NAAG-DPG
B. Tucholke	NARM-DPG
J. Watkins	A&G-DPG, SL-WG

PCOM watchdogs for highly ranked programs

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

Liaison with Other International Global Earth Science Programs

- Joint Global Ocean Flux Studies (JGOFS)

T. Pedersen has accepted appointment as a member and co-chair of the Liaison Group between JGOFS and ODP. PCOM will need to reciprocate by nominating a non-PCOM liaison from ODP to JGOFS.

- International Ridge Inter-Disciplinary Global Experiments (InterRIDGE)

J. Bender (LITHP) has accepted an appointment as a member and co-chair of the Liaison Group between ODP and InterRIDGE. Reciprocal action on the part of InterRIDGE is pending, awaiting formalization of InterRIDGE.

Co-Chief Nominations

Where thematic panels have nominated potential co-chiefs for legs scheduled for FY92, those names appear in their minutes. At this meeting, PCOM should forward co-chief nominees to ODP-TAMU for legs 143, 144, 145 and 146.

Acceptance of slates of members

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

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

Item O.
New Business

1. *Supplemental Science and the Development of Seafloor Observatories*

The chairperson directs PCOM to examine correspondence received from T. Francis on the subject of 'broadening the community of marine scientists who might benefit from ODP's capabilities', specifically using the drillship to deploy instrument packages, etc. on the seafloor for a variety of purposes, only some of which might be specifically related to ODP's specific program plans. The chairperson proposes to defer discussion on this issue to our August meeting, when it will form part of a larger discussion on the fate of supplemental science proposals received for the FY92 Program Plan, but preliminary discussion could take place at this meeting.

2. *Second Drilling Platform for Shallow-Water Operations: Atolls and Guyots and Continental Margins*

This is an issue raised by the SL-WG as a result of its initial meeting, and has been discussed in relation to drilling in atoll and guyot environments since COSOD-I. The capabilities of the *JOIDES Resolution* may not allow siting in shallow lagoons and on the inner parts of continental shelves, and therefore potentially impacts planned and projected ODP drilling operations in FY92, FY93 and beyond. Time permitting, PCOM may want to discuss this issue and forward a motion to EXCOM, which will be taking up the question of supplemental platforms at its July meeting.

Agenda **Item O.** will also include action items that may have been postponed from earlier parts of this meeting.

Item P.
Future Meetings

The 1991 Summer PCOM meeting will be hosted by U. von Rad at the Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover FRG, from 20-22 August 1991. A two-day field trip to the Harz Mountains will be held following the meeting.

The 1991 PCOM Annual Meeting will be hosted by J. Austin and the JOIDES Office at the University of Texas at Austin, Institute for Geophysics (Thompson Conference Center) from 4-7 December 1991. The meeting will be preceded by the Panel Chairperson's meeting at the same location on 3 December 1991. A one-day field trip will be held prior to the meeting on Monday, December 2, for participants willing and able to travel to Austin on Sunday, December 1. The JOIDES Office will attempt to get a head-count of field-trip participation at this meeting.

The 1992 Spring PCOM meeting will be hosted by R. Duncan at Oregon State University, College of Oceanography from 21-23 April 1992. A field trip will be held.

The 1992 Summer PCOM meeting will be hosted by J. Malpas in Victoria, British Columbia, Canada. No further details are available. PCOM may wish to set dates for that meeting at this time.

The 1992 PCOM Annual Meeting will be hosted by J. Mutter at Columbia University, Lamont-Doherty Geological Observatory. No further details are available. PCOM may wish to set dates for that meeting at this time.

Item Q.
Other Business

The following is a list of potential PCOM action items identified by the JOIDES Office from perusal of recent panel minutes, augmented by any other items that may have been deferred from earlier in the meeting:

1. *DMP*
A total of 3 borehole seals are due to be deployed during Leg 139, but there is panel concern that the FY92 ODP/TAMU budget does not allow for construction of that number in time for deployment to Sedimented Ridges. The BCOM minutes did not elucidate this situation. The PCOM chairperson would like feedback from ODP/TAMU and/or JOI, Inc. that funds are available for planned borehole sealing efforts during Leg 139.

2. *SMP/IHP*
Both SMP and IHP have endorsed adding a second full-time seagoing computer system manager for proper implementation of core-log data integration on the drillship.

Furthermore, SMP stands by its recommendation made at the Annual Meeting in Kailua-Kona regarding increasing the technical staff: *'The panel recommends an additional 8 technical staff positions of which 4 are directly supported by ODP/TAMU as FTE and 4 are supported on a one to two year basis by outside sources.'* PCOM has already received feedback from some of its members concerning the difficulty of supplying "temporary" technical support for the drillship. BCOM has recommended a FY92 base budget for ODP/TAMU that is $100K less than requested, a decision certainly inconsistent with a substantive increase in shipboard staffing. PCOM must discuss this issue and make a recommendation to both ODP/TAMU and JOI, Inc.

3. ACTION PCOM should take action on any or all of the issues raised above as appropriate, in the form either of consensus or motion.

Item R.
Adjournment

JOIDES PLANNING COMMITTEE ANNUAL MEETING
28 November - 1 December, 1990
Hotel King Kamehameha
Kailua-Kona, Hawaii

REVISED DRAFT MINUTES
(April 10, 1991)

Planning Committee (PCOM):

J. Austin, Chairperson - University of Texas at Austin, Institute for Geophysics
K. Becker - University of Miami, Rosenstiel School of Marine and Atmospheric Science
M. Cita-Seroni - University of Milan (ESF Consortium)
D. Cowan - University of Washington, College of Ocean and Fishery Sciences
R. Duncan - Oregon State University, College of Oceanography
H. Jenkyns - Oxford University (United Kingdom)
Y. Lancelot - Université Pierre et Marie Curie, Paris (France)
J. Mutter (for M. Langseth) - Columbia University, Lamont-Doherty Geological Observatory
M. Leinen - University of Rhode Island, Graduate School of Oceanography
J. Malpas - Memorial University (Canada-Australia Consortium)
R. Moberly - University of Hawaii, School of Ocean and Earth Science and Technology
J. Natland - University of California, San Diego, Scripps Institution of Oceanography
A. Taira - Ocean Research Institute (Japan)
B. Tucholke - Woods Hole Oceanographic Institution
U. von Rad - Bundesanstalt für Geowissenschaften und Rohstoffe (Federal Republic of Germany)
J. Watkins - Texas A&M University, College of Geosciences

Liaisons:

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

Guests and Observers:

J. Baker - Joint Oceanographic Institutions, Inc.
L. Cathles - Cornell University
T. Crawford - University of Tasmania (Canada-Australia Consortium)
P. Dauphin - Oregon State University
P. Davies - Bureau of Mineral Resources (Australia)
E. Davis - Pacific Geoscience Centre (Canada)
E. Kappel - Joint Oceanographic Institutions, Inc.
S. McGregor - National Science Foundation

Panel Chairpersons:

M. Ball - U.S. Geological Survey, Denver (PPSP)
S. Humphris - Woods Hole Oceanographic Institution (LITHP)
R. Kidd - University College of Swansea (SSP)
T. Moore - University of Michigan (IHP)
E. Moores - University of California, Davis (TECP)
K. Moran - Geological Survey of Canada, Dartmouth (SMP)

N. Shackleton - Cambridge University (OHP)
C. Sparks - Institut Français du Pétrole (TEDCOM)
E. Suess - GEOMAR, Kiel (SGPP)
P. Worthington - BP Research Centre, Sunbury-on-Thames (DMP)

JOIDES Office:

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

SELECTED ACRONYMS AND ABBREVIATIONS

CSDP	Continental Scientific Drilling Program
DCS	Diamond Coring System
DPG	Detailed Planning Group
EEZ	Exclusive Economic Zone
EIS	Environmental Impact Statement
FSDN	Federation of Digital Seismic Networks
GSGP	Global Sedimentary Geology Program
IGBP	International Geosphere/Biosphere Program
ILP	International Lithosphere Program
IRIS	Incorporated Research Institutions for Seismology
JAMSTEC	Japan Marine Science and Technology Center
JAPEX	Japan Petroleum Exploration Company
JGOFS	Joint Global Ocean Flux Studies
KTB	Kontinental Tief Bohrpogramm
LANL	Los Alamos National Laboratory
LRP	Long Range Plan
MCS	Multi-Channel Seismic
MOU	Memorandum of Understanding
NADP	Nansen Arctic Drilling Program
OSN	Ocean Seismic Network
PEC	Performance Evaluation Committee
RIDGE, InterRIDGE	Ridge Inter-Disciplinary Global Experiments (US and international elements)
SNL	Sandia National Laboratory
SOE	Special Operating Expenditure
STA	Science and Technology Agency of Japan
USSAC	US Scientific Advisory Committee
USSSP	US Science Support Program
WCRP	World Climate Research Program
WG	Working Group
WOCE	World Ocean Circulation Experiment

JOIDES PLANNING COMMITTEE ANNUAL MEETING
28 November - 1 December, 1990
Hotel King Kamehameha
Kailua-Kona, Hawaii

EXECUTIVE SUMMARY

PCOM Motions

PCOM approves the minutes for the 14-16 August 1990 PCOM meeting. (Page 6.)

PCOM adopts the agenda for the 28 November - 1 December 1990 PCOM meeting, with amendments. (Page 6.)

PCOM endorses the use of the Formation Microscanner (FMS) as a standard logging tool. (Page 21.)

With the present status of technology development, particularly DCS Phase II, it appears unlikely that an optimal science program can be undertaken both for Sedimented Ridges II and EPR Science I in FY 92. PCOM, therefore, moves that these programs be considered as a high priority for drilling at the earliest possible date commensurate with technology development and ship scheduling, assuming that the science remains a high priority of the relevant thematic panels(s). Since (at this time) the science at these areas is of extremely high priority in thematic panel and PCOM rankings, PCOM wishes to stress that technology development, particularly that of DCS Phase III, take place as expeditiously as possible. (Page 49.)

PCOM moves that, should a one-leg program of Cascadia margin drilling appear on the FY92 schedule, it should be that program submitted by the Cascadia margin Detailed Planning Group. (Page 51.)

PCOM moves that the JOIDES Resolution be scheduled to depart the Pacific Ocean approximately in mid-January 1993, thus allowing for 8 legs of drilling after the September 1990 port call at the conclusion of Leg 139. Thus the program is:

Leg 140	504B or Hess Deep	
Leg 141	Chile Triple Junction	
Leg 142	Engineering 4, EPR	
Leg 143	Atolls and Guyots	
Leg 144	Atolls and Guyots	
Leg 145	North Pacific Transect	
Leg 146	Cascadia Accretion	
Leg 147	Hess Deep or EPR	(Page 53.)

In the event that time is left following the attempt to clear and drill Hole 504B, these contingencies will be followed: 1) full logging program, 2) begin Leg 138 drilling. If the remaining time is too limited to begin reasonably Leg 138 drilling, then HPC/APC coring for hydrogeochemistry should be conducted in high-heat flow areas near 504B. (Page 54.)

PCOM establishes an Atolls and Guyots Detailed Planning Group (AG-DPG) to be charged to construct a two-leg drilling plan that includes the priority 1 and 2 targets of proposal

203/E(Rev) (approximately 38.4 days) and additional targets of proposals 203/E(Rev) and 202/E(Rev), selected so as to create a maximized, balanced scientific return from the range of objectives of these proposals. The DPG will also take into account thematic panel priorities. (Page 61.)

PCOM moves that nominees for panels, WGs and DPGs, selected by PCOM, be approached to serve. (Page 62.)

PCOM moves that JOIDES allow and advertise the possibility of including short, one to four days proposals along the general ship track. Proposals will be reviewed by the thematic panels, SSP and PPSP for PCOM's decision. (Page 64.)

PCOM will consider scheduling up to 10 days of *ad hoc* drilling during legs 141 to 147. (Page 65.)

PCOM endorses the recommendation of the Ocean History Panel that whole-round sampling for organic geochemistry (OG) be discontinued, and that frozen 30-cm whole-round core sections presently in the repositories stored as OG samples, be returned to the regular collection. (Page 65.)

<u>PCOM Consensuses</u>

PCOM endorses the use of the index properties manual *Recommend Methods for the Discrete Measurement of Index Properties on the JOIDES Resolution: Water Content, Bulk Density and Grain Density* aboard ship. PCOM also endorses the core-log integration plan developed jointly by SMP and DMP. Those panels will develop an implementation strategy. (Page 22.)

PCOM endorses the purchase of a second Rock Eval prior to Leg 139. (Page 23.)

PCOM endorses adherence to the guideline specifying preparation of safety packages prior to PPSP review. (Page 23.)

PCOM expects ODP-TAMU to maintain publication a continuing priority in FY91. PCOM will not, however, endorse a specific manuscript coordinator *per se*. (Page 25.)

PCOM generally endorses the PANCHM recommendations (Appendix 8) for the submission and review of "add-on" proposals. (Page 65.)

JOIDES PCOM
Wednesday, 28 November 1990

868 WELCOME AND INTRODUCTION

PCOM Chairperson J. Austin called the 1990 Annual Meeting of the JOIDES Planning Committee to order. R. Moberly welcomed the attendants to Hawaii and explained the logistics, including a luau hosted by the University of Hawaii and JOI, Inc. He thanked Allison Burns of JOI, Inc. for her assistance. Austin then called for introductions around the table.

869 APPROVAL OF MINUTES, 14-16 AUGUST 1990 SCRIPPS PCOM MEETING

Austin called for comments, corrections and approval of the minutes of the 14-16 August 1990 PCOM Meeting held at the University of California, San Diego, Scripps Institution of Oceanography. The minutes included modifications through November 15, 1990. There were no further corrections to the revised draft minutes.

PCOM Motion

PCOM approves the minutes for the 14-16 August 1990 PCOM meeting.
Motion Moberly, second Leinen Vote: for 15; against 0; abstain 0; absent 1

870 APPROVAL OF AGENDA

Austin stated that the main purposes of the meeting were to hear the reports of panel chairs, to improve communication among various parts of the scientific ocean drilling community, and to define and approve the Fiscal Year 1992 (FY92) Program Plan. He summarized the agenda and noted that the discussion of alternate drilling strategies for Leg 137 would be moved up on the Saturday December 1 schedule to accommodate the early departure time of Becker, sole chief scientist of that leg. He then called for adoption of the modified agenda.

PCOM Motion

PCOM adopts the agenda for the 28 November - 1 December 1990 PCOM meeting, with amendments.
Motion Cita-Seroni, second Natland Vote: for 15; against 0; abstain 0; absent 1

871 ODP REPORTS BY LIAISONS TO PCOM

EXCOM

Austin reported on the results of the EXCOM meeting held on 2-4 October in Villefranche-sur-Mer. He noted that Moberly was also present as that meeting marked the occasion of the change of JOIDES Office duties from the University of Hawaii School of Ocean and Earth Science and Technology to The University of Texas at Austin, Institute for Geophysics.

At the time of the EXCOM meeting, participation of the USSR in ODP had not yet been approved by the U.S., but such approval was expected in the near future. EXCOM passed a motion reaffirming its desire to have the USSR admitted as a member in ODP and requesting that, provided an invitation to membership was extended to the USSR, that USSR observers to future PCOM and EXCOM meetings be identified and accommodated (see PCOM Agenda Notes, p. 007, for exact wording.) An official invitation to the USSR was extended on 31

October 1990 by Allan Bromley, Science Advisor to the President of the United States (see pertinent correspondence attached to the PCOM Agenda Book). Austin asked Malfait, NSF liaison to PCOM, for an update.

Malfait replied that he had no new information. (The USSR accepted NSF's invitation on 29 December 1990, following the PCOM Annual Meeting.) He noted that the wording of the EXCOM motion was inaccurate since it referred to the reestablishment of USSR membership. The USSR has never been a member of ODP, though it had been a member of DSDP/IPOD. Austin said that the USSR may become a full member as soon as early 1991. He added that observers at EXCOM and PCOM will be guests, and will not be able to vote until a MOU has been signed with the USSR. In response to a question from von Rad, Austin said that the observers had not yet been invited.

Austin then reported on the response of EXCOM to STRATCOM recommendations. EXCOM applauded the activities of STRATCOM and in general took a more active role in addressing renewal. EXCOM discussed the issue of flexibility and passed a motion (PCOM Agenda Notes, p. 008) which gives PCOM and the advisory structure marching orders to do "exciting" science. EXCOM was also sympathetic to further focussing of ODP and to six major themes identified by STRATCOM (see EXCOM consensus on the Long Range Plan (LRP), PCOM Agenda Notes, p. 009.)

Malfait asked if EXCOM did not think that the work of ODP was exciting. Moberly responded that while PCOM had always felt that the science was exciting, EXCOM wanted it to be exciting to the general public and to scientists outside the sphere of ocean drilling. Austin added that some EXCOM members feared that renewal would be in jeopardy if no action was taken along these lines, and that PCOM would return to these topics later. Responding to a question from Duncan, Francis said that there would be four EXCOM members on Leg 136 (Oahu OSN pilot hole).

NSF

Malfait began his report by commenting on the "fascinating" beginning to FY91 caused by the chaotic situation created by the prolonged US federal government deficit reduction negotiations. Grants received only half of their funding during this period, a situation that is particularly serious since NSF spends 50-60% of its money in the first 4-5 months of each FY. Some programs were cut. The ODP funding increment remained intact, however, and Malfait acknowledged the contribution of McGregor, of NSF's Division of Grants and Contracts, in this accomplishment.

The FY91 budget of NSF was increased by 12%, compared to the 16% requested (see handout 1 distributed at the PCOM meeting.) The Ocean Sciences budget will probably be increased by 12%, with most of the increase going to the global change initiative. ODP will probably receive its requested budget increase of 9%. Any additional increment to cover increased fuel costs will come from an increase in the NSF contribution; the contributions of the international partners will remain constant for FY91. NSF/ODP field programs are listed in the handout. The Vema Transform and Kane Transform studies may be rescheduled from 1991 to 1992.

The invitation to the USSR to join ODP had been sent through their embassy in Washington. No response has been received and Malfait noted the need to check on progress. On behalf of

NSF, Malfait thanked Bromley, US Science Advisor to the President, and ODP's international partners who have maintained pressure to admit the USSR.

Regarding renewal, Malfait said that NSF foresees a 10 year program. The first 5 years (1994-1998) involve use of the *JOIDES Resolution* along with continuing technology development. Alternative or additional platforms will be considered for use post-1998. Three factors suggest the need to consider future directions during the first 5 years: 1) lack of a guarantee that the SEDCO contract can be extended beyond 1998, 2) the proposed Soviet drillship, and 3) the proposed Japanese drillship.

Dr. C.Massey has been nominated as new NSF director but will not take over until February-March 1991. The National Academy of Sciences (NAS) will review the LRP and NSF will review plans, budgets and contracts in late 1991 to early 1992. The review of USSAC's program plan for 1991-1993 is going well. Its review by the National Science Board (NSB) will occur in February 1991.

Discussion

Malpas asked if NSF had considered small increases to international partner contributions prior to renewal to avoid a big jump in contributions at renewal time, which could adversely affect renewal. Malfait replied that NSF does not envisage a major increase being necessary in 1993. NSF has discussed increases with international partners since the beginning of ODP. Partners accept that their contributions will have to increase but there has been no agreement on scheduling. Moberly commented that some EXCOM members had said that renewal would be easy if there was no step increase, but they had expressed concern that a step increase was on the way. Malfait reiterated that, based on the LRP, NSF does not expect that a large increase will be necessary.

Jarrard asked whether renewal could be for 5 instead of 10 years. Malfait answered that some partners prefer a 5-year renewal. He noted that even if the decision to terminate was made now, it would take 3-4 years to phase out ODP, and added that it may not be possible to extend the SEDCO contract beyond 5 years. Malpas asked whether NSF would be funding only Atlantic field programs in 1992. In response, Malfait said that the ODP-related field areas would be set by the 4-year plan and funding would be based on the resulting focus. NSF was now, however, open to field programs in any ocean. Leinen said that if the review of the LRP is delayed until the new NSF director takes over, the result will not be available until the end of 1991, leaving insufficient time to respond to recommendations. Malfait said that he was not sure that NSF would wait for the new director before initiating the review. Leinen asked that this concern over the timing of the review be conveyed to the NAS.

In response to a question from Austin regarding the effect on operations of a possible large increase in fuel prices, Malfait said that fuel prices have been stable for a month or two and there are no problems at present and none are foreseen if fuel costs remain stable. Austin asked if SOE expenses would be reduced and the money used for fuel, to which Malfait replied that there is a possibility of additional funds becoming available. Austin then asked when TAMU would approach SEDCO about renewal of their contract. Francis answered that there had already been some discussions and that SEDCO is sympathetic to renewal. Malfait noted that ODP has the option, at its own discretion, of renewal of the *JOIDES Resolution* contract until 1998.

JOI, INC.

Pyle began by relating that, at the October 1990 EXCOM meeting, he had made a number of suggestions, most importantly: 1) to adopt a surcharge on partner contributions, perhaps linked to technology development or fuel price increases, to avoid a large increase at renewal, and 2) to accept contributions in currencies other than dollars. No action was taken by EXCOM. Austin noted that EXCOM felt that an invitation would be extended to the USSR and that NSF felt that the resulting additional contribution would cushion the fuel price increase.

Pyle commented on the need to resolve FY90 budget overruns by LDGO and the Hawaii JOIDES Office. At the same time, TAMU and JOI, Inc. had under-spent.

In FY91, any USSR contribution would only be partial, for perhaps half a year. Set against this potential increase in funds are increasing fuel costs, which were double the budgeted amount at the Townsville port call. If the Producer Price Index (PPI) does not increase, there may be some money available to cover fuel costs. (The day rate for the drillship is tied to the PPI.) The cost of the DCS must be examined, it has proved to be a "money sink". Its status will be reviewed in December and Austin and perhaps others will be asked to attend. In response to a question from Sparks, Francis said that the DCS has cost $3-4 million to date, exclusive of ship time. Pyle continued by pointing out that while there is a desire to avoid costly development work on high-temperature logging tools, no suitable off-the-shelf tools exist. JOI, Inc. will appoint the third Performance Evaluation Committee (PEC-3) from a list of names decided upon by EXCOM. This review is required by NSF every 2 years.

Regarding FY92, Pyle stated that this would be the last 1-year program plan before the MOUs come up for renegotiation and renewal. JOI, Inc. will also coordinate reviews of both the LRP and Program Plan (largely a NSF function). FY92 will also bring further fuel cost uncertainty.

Since there are no off-the-shelf, slimline, high temperature tools which work completely, and given the NSF-incremented budget of $300,000 Pyle outlined the FY91 plan for high temperature logging and sampling. For temperature logging, the JAPEX tool (measuring temperature, pressure and flow) will be rented ($90,000-$100,000). This tool will not, however, be available until April 1991. As a back-up, the French tool (temperature only) will be built ($35,000-?). For water sampling, the Los Alamos National Laboratory (LANL) tool will be borrowed, though it is known to leak ($60,000). The Sandia National Laboratory (SNL) tool(s) will be developed on a proposed cost-sharing basis with KTB. Pyle noted that, in spite of these plans, ODP is going to be forced to develop something internally. He went on to address the issue of modeling and consulting. There may be a need for scientific advice. Discussions with R. von Herzen and J. Cann may lead to their use as consultants ($70,000). They would provide advice on what to expect on a site-by-site basis. C. Lister may also be available to carry out modeling (cost unknown).

Pyle then discussed liaisons with other earth science initiatives. Pyle said that 2 proposals for use of the Oahu OSN hole have been turned down by NSF. An *ad hoc* JOI, Inc./IRIS group has been asked to assist with planning/coordination problems. Nominations for members of a liaison group with Inter-Ridge are being sent by J. Delaney. PCOM should think about its members. There has been agreement on liaison by Zoback, co-chair of the International Lithosphere Program (ILP)/Coordinating Committee on Continental Drilling. Some names have been suggested and PCOM should consider nominations before the next PCOM meeting. A brochure on the Nansen Arctic Drilling Program (NADP) has been produced by JOI, Inc.; copies were distributed. There have been no responses regarding liaison from the Joint Global

Ocean Flux Studies (JGOFS) or PAGES. Leinen said that the JGOFS steering committee was to meet in late November 1990 and that this matter is on their agenda. Shackleton said that PAGES had postponed a meeting and Pyle added that PAGES is not yet sufficiently organized to permit formal liaison. Shackleton asked if PCOM ensured that the liaisons would include proper representation by thematic panels. Austin replied that the liaison would be from an interested/appropriate panel.

Pyle reminded panel chairs to talk to the PCOM Chairperson before making plans for *ad hoc* workshops and panel commitments. JOI, Inc. can only approve such plans upon Austin's recommendation. Kappel noted that travel funds for US personnel are from USSSP. Pyle completed his report by highlighting a special issue of *Scientific Drilling*, a new journal published by Springer-Verlag. It may provide an opportunity to publicize ODP. Austin said that PCOM would return to the issue of publications to advertise ODP later in the meeting.

Discussion

In response to a question from Cowan on the significance of the rejection of the seismometer (Leg 136) proposals, Pyle said that the proposals will probably be re-submitted, but that the nature and duration of the test must be better defined. Austin said that it was originally felt that there would be no guarantee of funding for the project until the hole existed. Pyle and Malfait agreed that the hole should be drilled first. Cowan asked what had happened since PEC-2. Pyle said that the major change had been from regional to thematic panels, and the development of inter-program liaison groups. There has been little progress on thematic publications, however. Kappel commented that individuals, but not ODP, have proposed thematic workshops to USSAC, and Pyle added that there had been no requests for the money JOI, Inc. set aside for this purpose. Austin said that TAMU has a list of publications on scientific ocean drilling and that it contains a large number of papers. He said that a version of the list would be available at the next PCOM meeting.

Worthington said that the question of high-temperature tools is the greatest problem facing DMP. If the DCS cannot be made to function, such tools may not be needed. In addition, the temperatures that will be encountered are unknown. In response to a question from Malfait, Francis said that he thought ODP would be able to accomplish whatever was requested by JGOFS for Leg 138, and Leinen commented that the co-chiefs were enthusiastic about this nutrient work. Pyle, responding to von Rad, said that PEC-3 would probably meet in January 1991.

SCIENCE OPERATOR

Francis said that Leg 133 had broken records across the board (Appendix 1). In addition the vibro-percussive corer (VPC) was tested. The greater core recovery will increase future costs of storage and publication. There was concern during the leg that the ship would run out of liner! Less than a week before the end of the leg ODP-TAMU learned that there was no fuel in Townsville and that the ship would have to go to Cairns. ODP-TAMU then discovered that there was no fuel in Cairns. The ship ultimately went to Townsville, and fuel became available in Gladstone. The Townsville port call lasted 3.5 days and went well. After refuelling in Gladstone, the ship began Leg 134 just 24 hours behind schedule and made up half a day in transit. The cost of fuel was $435/ton, compared to the budgeted amount of $200 per ton. ODP-TAMU has already overspent its FY90 budget for fuel by $300,000.

On Leg 134 (Vanuatu), poor hole conditions prevented target depths being reached at two sites (DEZ-2 and DEZ-4). At DEZ-1, basement of volcanic breccia and altered basalt was reached. At DEZ-5 and IAB-1, the target depths have been exceeded. While drilling at DEZ-4, *JOIDES Resolution* was visited by officials from Vanuatu and was required to clear customs, even though the ship was only within Vanuatu's EEZ.

Regarding upcoming legs (PCOM Agenda Book, p. 004), Francis reported that clearance for Leg 135 (Lau Basin) had been obtained from Fiji but is still needed for Tonga. Scientists from both of these parties will be on Leg 135 and a request from Tonga for an additional scientist has been approved. Cost of fuel in Fiji is expected to be about $400/ton. Leg 135 ends with a long transit to Honolulu, dropping the scientific party off at Pago Pago on February 17 1991. The scientific party for Leg 136 (OSN-1) includes members of EXCOM; staffing of the leg is almost complete. Becker will be the sole chief scientist on Leg 137 (Engineering 3A at 504B) with a scientific party of about 8. Staffing of the leg is complete. There will be no boat link to the Galapagos Islands or Ecuador. A port call in Costa Rica was considered but the correct fuel type was not available and Leg 137 will still end in Panama. In response to questions from Natland and Mutter, Francis said that the *JOIDES Resolution* requires low sulphur fuel and that fuel costs in Panama were as yet unknown.

Staffing of Leg 138 (Eastern Equatorial Pacific) is almost complete. Responding to a question from Shackleton, Francis said that from Leg 138 on, places are being held open for 2 scientists/leg from the USSR. This will increase the scientific party on each leg by 4, since the present policy is to balance numbers of US and international scientists. Malfait said that when the USSR joins, the problem of the scientific party being too large will have to be addressed and Austin added that PCOM may have to consider a limit on party size. Francis continued, stating that 2 sites on Leg 138 require clearance, one from Ecuador and the other from France. Coring will be heavy and involve triple APC coverage.

Kidd returned the discussion to the topic of scientific party size, which he said was getting out of control. The US vs. international parity should be considered over an entire year, not for each leg. Francis answered that that was indeed the policy but that size will, on average, increase. Cita-Seroni stressed the importance of allowing non-US scientists access to every cruise. She suggested that each non-US partner should continue to be entitled to 2 places per leg and that total scientific party numbers be reduced by reducing the US staffing allowance below the present 50%. Francis noted, however, that the US pays more than 50% of the budget. Austin said that PCOM would return to the question of staffing later in the meeting.

Francis continued his report stating that PPSP has set up a subcommittee to consider safety associated with hydrothermal drilling on Leg 139 (Sedimented Ridges I). Malpas noted that Canada requires an environmental impact statement (EIS, soon to be available) to address: 1) H_2S concerns (Canada will insist on an H_2S expert aboard the ship), and 2) placement of re-entry cone(s) where damage to the biota will be minimal. If these conditions are met, Canada will issue clearance. Austin commented that these points had been considered by PPSP for some time and will form part of their revised guidelines, to be published in 1991. PCOM will also need to know if safety considerations might increase leg length which will also be considered further later in the meeting.

Francis went on to discuss publications. FY90 has been a period of catching up with the publication schedule. More pages were published during FY90 than in the previous 4 years (Appendix 1). The post-cruise delay in publication of Initial Reports was reduced to 12 months from 20, and that of the Scientific Reports was reduced to 3 years from 4 (Appendix 1). Some

FY90 publications will be paid for with FY91 funds because of routine delays in invoicing and payment. Initial Reports volumes are increasing in length (Appendix 1) owing to greater core recovery and the presence of Macintosh computers aboard ship, resulting in more figures/chapter. The result is increasing production costs. The FY91 publication schedule assumes a budget that is not reduced because of increased fuel costs. Even so, ODP-TAMU has funds to produce only 6 volumes. The capacity of ODP-TAMU is 14 volumes/year but funds to pay outside contractors are limited. Responding to questions from Kidd, Francis said that some volumes, otherwise ready for publication, will be shelved, though if money were made available they could be published. Moore noted that there was no trend in the size of the Scientific Results volumes. Replying to Shackleton's comment that concern would be generated if deadlines for submission to volumes were changed, Francis said that ODP-TAMU would try to avoid such changes. Von Rad and Moore noted morale problems would result if publication is delayed after scientific parties have been pushed to meet deadlines. Austin added that it is also a renewal issue as it would not be beneficial if publication slips behind schedule near renewal time after the big effort to catch up. Francis said that it will cost an additional $500,000 to publish all available volumes in FY91.

Francis displayed a pie chart of the ODP science operator FY91 program plan budget to place the cost of fuel in context (Appendix 1). Fuel amounts to 5.5% of the total, and the budgeted figure of $1.9 million assumes a requirement of 9500 tonnes over the year at $200/tonne. The price in Guam in August 1990 was $180/tonne, that in Townsville $435/tonne and the projected price in Fiji $415/tonne. This would leave ODP-TAMU $600,000 over budget. Over the whole of FY91, the shortfall could be $2.2 million. Consequently, ODP-TAMU has frozen all Special Operating Expenditures (SOE) for Diamond Coring System (DCS) drilling, publications and drilling supplies. Francis said that he was, therefore, pleased to hear that NSF will be able to find extra money. Austin asked Malfait about the amount of money being considered by NSF. Malfait replied that there are several options, that NSF was moving quickly to resolve the problem and that no problems are anticipated. Francis stressed the importance of moving quickly as ODP-TAMU cannot commit money to the DCS. A decision on funding is required by mid-December if the DCS is to be used on Leg 140. If its use is allowed to slide to Leg 141 (this option would be preferable because the SEDCO crew with experience of DCS drilling would be aboard) it would only push the decision point back by one month to mid-January. Replying to questions from Becker and Natland, Francis said that ODP-TAMU had suspended all preparations for DCS drilling on Leg 140 and that there were insufficient funds for expensive items, such as a H_2S expert, on Leg 139. Austin made the point that this impacts FY92, in addition to FY91, planning. Francis said that planning will have to go ahead under the assumption that the money will be provided.

WIRELINE LOGGING SERVICES

Jarrard first summarized recent technological developments (Appendix 2). The feasibility of logging in conjunction with the DCS was tested on Leg 132 and the result was unsuccessful. Leg 133 included 3 technology developments. 1) The Wireline Packer proved unsuccessful. ODP-LDGO is considering the costs in money and time required to develop an operational Wireline Packer and will report to DMP and PCOM at their next meetings. 2) Core imaging for link to FMS, involving high-resolution resistivity imaging of cores as a link between cores and FMS logs. In response to a question from Moore, Jarrard said that the high-resolution core imaging is carried out on split cores. 3) The Sidewall Entry Sub (SES) was an important development (by ODP-TAMU) used at one hole (823C) to 1000 mbsf. The hole could not have been logged without the SES, which worked well with only minor bugs. Little additional work is required. The SES allows faster logging in a wider range of holes. Leg 134 will incorporate a Vax station for shipboard FMS processing, communication between the shipboard, ODP-

LDGO and ODP-TAMU computers, and the German digital slimhole televiewer (already run successfully in 2 holes). The usefulness of the French magnetometer/susceptibility tool to ODP will also be evaluated. The susceptibility tool has proved successful but data from the magnetometer will require substantial reprocessing in order to obtain reversal stratigraphy. To date on Leg 134, 3 sites have been successfully logged. Hole caving has caused problems in the bottom 100 m of the holes.

Jarrard summarized logging on Leg 133. Drilling followed an east-west and a north-south transect. Logging was successful at almost every hole where it was attempted. The 12 sites and 5100m logged are approximately equal to the total for the preceding 4 legs combined. Because of the number of sites logged, all 3 strings were not always used. Some sites were logged in great detail so that nearby sites did not require as many runs. The lithology comprised carbonates at most holes. Features of several logging runs are interpreted as being related to sea-level variations (Appendix 2). On the Marion and Queensland plateaus, sawtooth patterns of upward-decreasing porosity (increasing diagenesis), terminated by abrupt increases in porosity (change to uncemented sediment), are thought to relate to cycles of subaerial exposure. Off the Great Barrier Reef, clay/carbonate cycles were observed. Inter-site correlations and ties of logging results to seismic profiles will be particularly important in the sequence stratigraphic interpretation of onlap/offlap patterns. Ties between sites yield differential sediment accumulation rates which can be removed, allowing comparison of lithological variations along transects. The assumption that seismic reflections are chronostratigraphic horizons will be tested. Sedimentary facies and dip variations will also be interpreted as sea-level patterns. Such patterns are particularly clear on geochemical logs when two components, for example clay and carbonate, are present (Appendix 2).

Natland asked about the Motor-Driven Core Barrel (MDCB) and Francis answered that it had been used on Leg 134 and had worked well. It is still under development but looks much more promising than the old Navidrill.

872 JOIDES ANNUAL REPORTS BY SERVICE PANEL CHAIRPERSONS

PPSP

The 1990 activities of PPSP are summarized in Appendix 3. Ball pointed out some areas of concern, one of which was the short lead time of proposals reaching both PPSP and SSP. Ball recommended that guidelines for proposal preparation be distributed and that a proposal length limit be set to ease the workload on PPSP. Regarding proposed "add-on" science, Ball said that the preference of PPSP would be for expansions of logging or drilling at previously-reviewed sites. The main concern at sedimented ridges drilling sites is with H_2S and a subcommittee has been established to develop procedures to deal with these hazards. Finally, there is to be a change in the policy for drilling clathrates. Penetration of the reflector giving rise to the BSR will no longer be prohibited; consideration will be given on a site-by-site basis.

Discussion

Von Rad said that SGPP had suggested a working group (WG) on BSRs, involving members of SGPP and PPSP. Suess added that French discoveries of H_2S gas hydrates have wider bearing than sedimented ridges and may justify a WG. Responding to Austin, Ball said that the update on safety guidelines for clathrate drilling will not be completed until after April 1991. Information may have to be passed to Canada prior to this to assist its preparation of the EIS for sedimented ridges and Cascadia drilling. Malpas said that Canada will need 9 months lead time to complete its study and issue clearance. Moberly noted that the earliest that either leg could be drilled is November 1991, and Ball responded that the timing of the approval process should not, therefore, be a problem. In response to a question from Natland, Ball said that the revised safety guidelines would be published in a special issue of the *JOIDES Journal*. Austin reiterated that the guidelines would also have to be disseminated early to, for example, Canada. Ball commented that safety guidelines often do not reach chief scientists.(Note added in revision: Francis has stated that ODP-TAMU routinely sends safety guidelines to Co-Chiefs when they accept the invitation to sail. The guidelines form part of a large package of information.) Austin said that Kidd would touch on a related matter addressed in the Panel Chairperson's Meeting. Responding to von Rad, Ball said that PPSP had not discussed the possible Santa Barbara Basin "add-on".

Austin summarized PCOM action items from the meeting so far. Kidd said that SSP would be interested in the proposed SGPP/PPSP WG on BSRs. Austin said that it could be an *ad hoc* group. Von Rad asked PCOM to consider increasing the time allowed for international partners to reply to RFPs from the present 3 weeks to 4-6 weeks. Austin said that PCOM may decide to make a statement on the minimum time necessary for such response.

DMP

DMP 1990 activities are summarized in Appendix 4. Worthington noted that the Wireline Packer has not been successful and represents a very ambitious goal. There is still no information on when high-temperature logging capability will be required. Shipboard integration of core and log data is well underway; this has never been tried by the oil industry. In this context, Jarrard noted that not all holes will be suitable for obtaining Milankovitch cyclicity with the sediment magnetometer. Worthington said that the time has come to publish guidelines for third-party tools in the *JOIDES Journal*.

Commenting on the specific recommendations of DMP (Appendix 4), Worthington said that the FMS is now well-proven and should become a standard tool. Regarding causes for concern, the WG on Nankai-type hole instability should precede the next DMP meeting. The issue of high-temperature logging may arise at short notice and, together with problems associated with the wireline packer, may require meetings outside the normal panel schedule. The system needs the flexibility to allow such meetings and DMP would like PCOM to address the issue. DMP is under great pressure at its meetings and, while a proliferation of meetings is to be avoided, some extra meetings involving only interested parties would be helpful.

Shackleton commented that the correlation of core and log data is a major achievement and should be highlighted more than the sediment magnetometer, which will not yield useful results in most holes; knowing the depth of the core in the hole is vital. Austin said that the issue of whether to sail with additional DCS expertise (Appendix 4) is important but will be deferred until more is known about the status of, and outlook for, continued DCS development and deployment(s).

SMP

Appendix 5 outlines the SMP report. Moran highlighted the problem of consistency in density measurements. The index property manual has been under review since June and PCOM should decide on its application. A workshop on physical properties measurement would be beneficial. Improved resistivity measurements are needed. The Rock Eval can be down for whole legs and PCOM should decide on the purchase of a back-up instrument. It is an important safety concern. Moran also requested PCOM action on the computerization of the micropaleontology lab. There is a need to study high-speed streamers to improve the collection of underway geophysical data at steaming speeds. The XRF is often down and the electronics technicians are not trained in its repair. Moran requested that the ESF representative put pressure on the European manufacturer of the XRF to train ODP technicians.

SMP defined user requirements for core-log data integration (Appendix 5 and SMP minutes). Core nominal depths should be corrected using the Sonic Core Monitor (SCM) and log data to give reference depth. Shipboard data acquisition must be improved, including natural gamma, magnetic susceptibility and resistivity data and a core logging data specialist should be present on each leg for data processing. Finally, the data must be made generally available. SMP seeks PCOM endorsement of these requirements and a plan to set up a WG on core log integration.

The ratio of technical to scientific staff aboard ship has decreased, while the amount of technical equipment has increased. SMP would like 4 extra technicians/leg or cuts in shipboard measurements may prove necessary. Responding to Austin, Moran said SMP had not discussed what might be cut. She also requested that technical staff be assigned to one lab for at least 6 legs. The latest (Fall 1990) SMP minutes (p. 1) contain a list of suggested equipment priorities.

Discussion

Kidd, referring to another SMP suggestion that graduate students be involved in technical support, asked if they would be tied to a particular lab. Moran replied that this was the intent. In response to a question from Leinen, Moran replied that students could handle those tasks, such as core splitting, that require little training. Moore asked for more information about the SCM. Francis said that it had been partially successful and that he would be providing further information in his engineering report. Natland asked if there were any plans to remedy the inability to measure pore water samples, now that there is no longer a CHN analyzer aboard the ship. Moran replied that the problem was under consideration but that there would be no capability on Leg 135.

Austin raised the issue of the number of scientific and technical staff aboard *JOIDES Resolution*. Davies noted that Leg 133 carried 29 scientists and a full technical staff and that there were 2 spare bunks. Austin said that 8 additional personnel had been suggested, 4 technicians and 4 scientists following full participation by the USSR. He commented that more work will no doubt be found for them to do, leading to future requests for for even more staff. Shackleton asked about the possibility of other countries providing technical support for less-skilled tasks. Moran replied that this had been suggested. Lancelot suggested that trained technicians from labs other than ODP-TAMU should also be invited. In this case, the technicians could count as members of the scientific party. This approach would not add to the FTEs at ODP-TAMU. Kappel noted that such technicians will need travel funds and salary, which would involve USSAC. Francis said that he was surprised by how few nationals of the international participating countries work at College Station. Leinen said that the ideas presented may be a way to include graduate students without their having to compete for the same berths as established scientists, a practise that has been criticized. Austin said that PCOM should make a statement about the size of the shipboard party and that some action items be considered following the panel reports.

SSP

The SSP annual report is summarized in Appendix 6. Kidd emphasized that, in terms of the existing SSP mandate, regional seismic data are needed in support of proposed Hess Deep drilling and PCOM action is required. He made the general comment that visits by proponents to the Data Bank should be funded by proponents. PCOM should encourage proponents to begin filing data for Atlantic proposals with the Data Bank. Austin responded to this and a suggestion from Moberly by saying that proponents have until approximately January 15 1991 to rework proposals. If no revisions have been received by the JOIDES Office by that date, Austin will inform all proponents that they must begin sending data to the Data Bank. Leinen asked when all data should be in the Data Bank. Moberly noted that PPSP will not review sites until all data have been filed. Kidd added that existing guidelines for proposals contain a flow chart indicating that all data should be at the Data Bank at least 6 months before safety review. It would therefore be sufficient to receive all seismic data when proposal revisions are received by the JOIDES Office. Kidd concluded his report with a list of other causes for concern (Appendix 6).

Discussion

Natland referred to the discussion of the Hess Deep program in the latest SSP minutes (July 1990 meeting). SSP considers that MCS data are necessary prior to Hess Deep drilling. A proposal for such work was under review at NSF and Natland was disturbed by what appeared to be almost an endorsement of this proposal prior to its review by NSF. Natland said that there should be no perception of endorsement of a proposal by ODP before its review by NSF and that he was also concerned about the potential for a breach of confidentiality. Austin added that SSP must be cautious about disseminating information on a proposal that is also before a funding agency. Kidd said that SSP had been cautious and did not wish to endorse the proposal. SSP needs to have access to all available data and the presentation on the proposal had been useful. In any event, SSP wanted a more comprehensive seismic grid than was proposed.

Taira suggested that ODP-TAMU investigate technological innovations to handle strong currents to avoid problems such as those encountered at Nankai (Leg 131). Oceanographic problems should be discussed. Kidd said that oceanographic problems are discussed at pre-cruise meetings. Early in ODP graduate students at ODP-TAMU performed oceanographic site reviews.

Moberly, referring to SSP cause for concern (Appendix 6) regarding the terms of reference for service panels, which state that ".....service panels.....are not directly involved with the selection of drilling targets.....or definition of cruise objectives," noted that EXCOM rewrote the SSP mandate and advised the wording to avoid situations in which SSP might dictate locations of drilling sites. Austin agreed.

TEDCOM

Sparks began his presentation by noting that 1990 had been a very satisfactory year at TEDCOM. Direct contact between TEDCOM and members of the thematic panels occurred for the first time. Activities during the year comprised two TEDCOM meetings, a Deep Drilling Working Group (DD-WG), and attendance of a TEDCOM member at the March LITHP/TECP meeting.

Dr. Khakhaev and Dr. Gamsakhurdia of the USSR attended the September TEDCOM meeting and DD-WG. They were very positive participants and answered questions from the ODP-TAMU engineers.

Presentations on ultra-deep land drilling in the USSR, Sweden and FRG were given to the DD-WG. The USSR is able to use turbines and aluminum drill strings since temperatures at the Kola Peninsula sites do not exceed 200 °C at 12 km. The KTB (FRG) pilot hole was drilled to 4 km with continuous, diamond coring using a high-speed top drive. A 10 km, ultra-deep hole has been spudded and will be discontinuously cored using downhole motors. Swedish drilling has reached 7 km using roller-cone bits. The primary message received was that there are many different techniques and the choice between them may be subjective; no general rules could be deduced. Problems encountered in each case were similar, in particular: 1) breakouts at depth, due to unbalanced stresses, and 2) deviations from the vertical (up to 30°). Deviations were countered in the USSR using weighted stabilizers. Several more sophisticated, but as yet untried, automatic compensation systems are planned for use by KTB. The consensus was that existing capabilities of the *JOIDES Resolution* would allow a penetration of 3 km with a total drill string of about ~8 km.

Nonetheless DD-WG was unable to respond to the PCOM mandate generated at its August 1990 meeting. DD-WG suggested dropping the WG approach and returning primary responsibility for deep drilling to TEDCOM. ODP-TAMU, or a sub-contractor, should perform specific and detailed studies based on a small number of generic deep holes specified by the thematic panels and endorsed by PCOM. The holes might be located in: 1) an accretionary margin, 2) a passive margin, and 3) oceanic lithosphere.TEDCOM will review the results of these studies. Sparks added that PCOM has seemed reluctant to choose specific sites for deep drilling, but the detailed definition of generic holes would allow detailed studies to proceed. Responding to a question from Moberly, Sparks said that 6 km penetration is possible with the *JOIDES Resolution*, but only in sedimentary rocks and not in 4 km water depth.

Besides deep drilling, the main preoccupation of TEDCOM has been the DCS. TEDCOM is actively involved in advising ODP-TAMU on the development of DCS Phase III. This should involve suppression of the secondary platform in the derrick for improved safety and efficiency. Sparks praised the work done by ODP-TAMU engineers. TEDCOM is very satisfied to note how their advice has been incorporated into DCS development, for example the development of a seabed system to avoid heave of the API string in the hole during running of the DCS string. It is necessary to refine the method of stabilizing the API string, however. The disconnectable point tried on Leg 132 had problems. The main concern of TEDCOM is how to speed up development of the DCS. The full DCS was tried for only a few days on Leg 132 and almost all core recovery occurred on one afternoon. If the present frequency of engineering legs is maintained, it will be several years before the DCS is fully operational. This technology is breaking new ground. It is an enormous extrapolation of technology used successfully in the North Sea in only 200 m water depth. TEDCOM recommends two approaches to accelerating the development of the DCS (see TEDCOM September 1990 minutes): 1) test the DCS on a separate vessel or barge so that development and testing can proceed continuously, and 2) get oil industry interest and funding. AMOCO should be approached first as AMOCO staff have expressed interest in the DCS. B. Harding has been informed of a seminar on slimhole drilling on December 12 1990 in Newcastle, UK. This would provide a good opportunity to speak publically about such collaborations possible.

TEDCOM is particularly impressed by ODP-TAMU development of the Motor Driven Core Barrel (MDCB). The tool has been completely rethought and redesigned to correct built-in defects in the original version (Navidrill). During the September 1990 TEDCOM meeting, Prof. Rischmuller proposed that development of the Pressure Core Sampler Sample Chamber (PCSSC) should be shared between ODP and KTB (see TEDCOM minutes).

Responding to PCOM, TEDCOM discussed logging in loose sands. Recommendations were the use of mud, inert casing or inert drill strings. Other PCOM suggestions for discussion were not received until after the TEDCOM meeting.

Discussion

Leinen said that previous presentations of results of the Leg 132 have suggested that success with the DCS was just a leg away. She asked for clarification. Francis said that real success will be a production model DCS operated from the rig floor, i.e. Phase III. Austin asked that discussion of the DCS be deferred until the following day. Francis noted that oil industry involvement in the DCS would be breaking new ground. Austin said that EXCOM had addressed joint developments and Moberly added that any joint developments would be legally governed by TAMU policy on patents. Von Rad suggested that PCOM had asked DD-WG questions that were too simplistic and which DD-WG could not address. He added that SGPP had suggested deep drilling from islands, for example from sites in the Aleutians into the accretionary wedge, as an alternative to keeping the ship on station for extended periods. Austin said that ODP-TAMU engineers want more feedback from the science advisory structure. This should be an iterative liaison process. There will be no alternative platform within 5 years. PCOM should, however, address the need for specification of deep drilling sites, real or generic. In response to a question from Lancelot, Sparks said that TEDCOM did not assess milling of Hole 504B. Sparks agreed that TEDCOM would be appropriate for reviewing plans for engineering legs, for example the work at 504B, but that there was insufficient time.

DEEP DRILLING WG

Natland, as PCOM liaison, reported specifically on the DD-WG meeting (see Agenda Book white pages p. 83). DD-WG addressed holes as deep as 4 or 5 km, but was reluctant to be specific about technologies required for, for example, reaching the mantle. DD-WG recommended closer liaison with ODP-TAMU engineers, since they have the expertise. Expertise was not present in DD-WG to discuss, for example, risers. Discussion focussed initially on continental margin drilling in sediments and drilling in crystalline rocks. Subsequent discussion addressed drilling to the Moho. There was confusion about the type of hole to be drilled. A system must be designed that meets the specifications of PCOM, but there is no need to assume that drilling will commence with rotary coring, for instance. As soon as targets have been identified, information should be transmitted to the ODP-TAMU engineers for their assessment. They will be able to give their requirements for the next 5 years. A start should be made soon and it should be done through ODP-TAMU.

As indicated in the TEDCOM report, continental deep-drilling programs have adopted differing philosophies. DD-WG could not distill these into a report, but the meeting gave ODP-TAMU engineers an opportunity to examine the problems associated with deep drilling. Deviation from the vertical has not yet been experienced in ODP; schistosity which produces deviations may be absent in drilling environments likely to be encountered by ODP. However, at 4 to 6 km breakouts may occur. DD-WG was impressed and encouraged by the success of the continental holes. ODP should have technological options available to deal with problems as they arise, for example by the use of casing, or changing the type of drilling.It should be possible to make a start on deep holes and progress to 2 to 3 km penetration by 1998. ODP should have such holes in place, and their upper portions cased (especially in basalt), by 1998.Then the push to greater depths can be designed.

Discussion

Responding to a question from Kidd, Natland said that he did not know how difficult it would be to deviate an ODP hole. ODP deviates to pass junk, away from, instead of back to, the vertical. Austin said that the most important aspect of the meeting was the need by the ODP-TAMU engineers for information from the scientific community. He said that he would like TEDCOM to play a role, in addition to ODP-TAMU. Natland said that ODP-TAMU engineers present options and TEDCOM assesses these. Moberly noted that the Science Operator cannot advise itself; TEDCOM must be involved. Sparks said that if thematic panels send TEDCOM information on prospective deep holes, it will give direction to ODP-TAMU. Austin added that the JOIDES Office should also be in the loop. Pyle said that ODP-TAMU are stretched thinly already, yet the discussion suggests adding to their workload. Sparks replied that they could subcontract the work or increase their staff, but agreed that both options would require increased funds. Austin asked if PCOM should allow ODP-TAMU to take on the load if it means that they will have less time for other important tasks. Von Rad said that panel chairs had discussed this, and Suess reiterated the SGPP proposal to drill from an island. Austin said that ODP-TAMU engineers do not believe that the limits of the *JOIDES Resolution* have yet been tested, and that the use of alternative platforms will not occur until this has been done.

Humphris commented that deep penetration has been a high-priority, but long-term, objective since the beginning of ODP. In the meantime, ODP can attempt offset drilling. However, ODP should continue to develop long-term methods. Moores said that TECP is also interested in the long-term objective of deep drilling. He added that offset drilling must be carried out at sites where structure is well understood. Sparks expressed surprise that the proposal to drill on an island was politically acceptable, since it was not ocean drilling. Pyle noted, however, that a continental drilling program would probably not consider drilling on an island to lie within their sphere of operations either. Responding to a question from Cita-Seroni, Francis said that the present capability of the *JOIDES Resolution* is ~3 km penetration with ~8 km of total drill string, according to TEDCOM. Austin concluded the discussion by saying that the advisory structure and ODP-TAMU should pursue interactive discussions on deep-drilling. Thematic panels should pursue long-term objectives, but for the present the capability of *JOIDES Resolution* should be maximized.

IHP

The IHP report is summarized in Appendix 7. Moore complimented the ODP-TAMU publications groups and also the co-chiefs who have met publication deadlines. Manuscript submission time appears to be the most important factors influencing publication delay. If manuscripts are received within 95 weeks, Scientific Results volumes should be out within 36 months. If manuscripts are in on time but there are insufficient funds for publication, this would reflect negatively on ODP. IHP, therefore, requested that PCOM support allocation of sufficient funds to ensure publication of all completed volumes. In requesting that PCOM endorse permanent retention of the second manuscript coordinator at ODP-TAMU, Moore said that it would be advantageous to have a scientific liaison, rather that purely librarians, in the Manuscript Coordinators Office. Commenting on the vast amount of data being collected and the need to archive these data properly and make them accessible to shipboard scientists, Moore asked if all data were needed, or collected simply because the capability exists? The resultant volume of data adds to the workload on the scientific party. Moore added that a second cause for concern is the need for a Micropaleontological Reference Center WG to address standards and needs of reference centers and their potential educational uses.

Discussion

Leinen agreed that concern about the amount of shipboard data is valid. A similar concern among workers in earth-orbiting satellite programs led to their funding a pilot program to study types of data, storage media and known and potential applicability. ODP may need a similar study. Shackleton said that delays in communication cause many problems in publication and questioned whether ODP-TAMU was using the quickest methods. Moore replied that the situation is complex. There is an expertise problem; people controlling publication are not scientists. Communications with the manuscript coordinator must be improved. Kidd agreed, adding that the science operations group should oversee the publications group. Suess commented that PCOM had discussed publication outside the ODP volumes and queried whether IHP had addressed this point. Austin said that ODP-TAMU is keeping a data base of drilling publications. Moore said that the best source of information is Georef and Austin responded that ODP-TAMU had just subscribed to Georef. Ball said that there used to be a science editor. Francis and Moore acknowledged this, but said that the work is now done by an Editorial Review Board (ERB).

Cowan asked if IHP was monitoring the inclusion of synthesis chapters in the Scientific Reports volumes. Moore replied that data are available but that IHP finds out after the fact. Results are not commonly seen for 2 to 3 years after a policy change. One change that should help preparation and inclusion of syntheses is the introduction of a second post-cruise meeting. Moberly said that if an extra 3 months were allowed for completion of the synthesis chapter, the volume could still be published on time. Von Rad said that the ERB should meet with manuscript coordinators. Austin added that PCOM must exercise care when nominating co-chiefs; poor post-cruise performance by some co-chiefs has contributed to the problem.

873 ACTION ITEMS / SERVICE PANELS

Austin decided that PCOM should address individual service panel concerns before moving on to other agenda items, in order to assure panel chairs that PCOM was responding to their concerns. He deferred the JOI, Inc. action items involving consideration of ILP and Inter-Ridge liaisons and also the SMP action item concerning number in the scientific party until later in the meeting.

PPSP

PPSP had asked about increasing lead time. Austin said that this was an old problem and that he did not think that PCOM could endorse increasing lead time. The second PPSP action item was the PPSP recommendation that the length of proposals be limited. Mutter suggested that proponents be asked to provide extended summaries to PPSP. Austin said that other panels were also concerned about proposal length. He suggested that a requirement for an extended summary could be added to the proposal submission guidelines. Humphris said that since panels still have to read proposals, a length limit would be preferable. Kidd expressed concern that proponents would shorten proposals by omitting data. Watkins asked the average length of text in proposals, and Moberly responded that they are "big". Natland said that variable length proposals cannot be prevented, since problems they address vary in scale. DPGs will help, however, since by the time they reach PPSP and SSP, proposals will be incorporated within composite documents. Austin suggested that the problem be addressed specifically for PPSP and Moberly agreed, adding that PPSP was, like TEDCOM, not comprised of academics; the panel chair should be allowed to decide. Austin said that the safety package should be more concise that the original proposal. Ball asked how NERC handled its letter proposal guidelines. Kidd replied that there was strong resistance to long proposals in the UK. Austin said that he was reluctant to stipulate a length, which will depend on the program being proposed. Leinen noted that NSF policy is that all proposals are limited to 15 pages no matter what the scale of the project. Why cannot ODP do likewise? Austin said that he would prefer to leave this until the time of submission of safety packages, but that he would modify the guidelines to discourage excessive length.

PPSP had wanted joint meetings or WGs with SSP and SGPP on the issue of BSRs. Austin said that he felt that PPSP and SSP liaisons should attend the next (March) SGPP meeting for such discussions, which could be incorporated into a third day of that meeting. SGPP will invite selected PPSP and SSP members as guests.

DMP

Austin deferred discussion of the DMP action item to include additional DCS expertise on legs using the DCS. DMP had also recommended that FMS be run as a "standard" tool. Moberly recommended that PCOM endorse the practice since FMS has been successful. Becker said that FMS will require a separate logging run, raising the number of runs back to 3/site. Jarrard said that the additional time required would be about 6 hours/site. Worthington pointed out that when ODP-LDGO combined 2 tool strings into 1, reducing the number of logging runs from 3 to 2, he had felt that a vacancy had been created. Leinen moved that PCOM endorse use of FMS as a standard logging tool to be used at all holes which are logged; Moberly seconded the motion. Worthington said that at the moment not every hole is logged by the standard 2 runs. Jarrard added that FMS is already run at most sites and, therefore, the increase in logging time resulting from the motion would be limited. FMS, however, already strains ODP-LDGO. In response to Mutter, Jarrard said that no combination of existing tools plus FMS could be reduced to 2 strings. Davies said that it would be useful to wait until FMS gives more information about the rocks. It is beneficial to have a choice of tools and too early to know that FMS will solve all problems, though that stage may be approached in the future. Moberly said that he would not second the motion if it was made less specific. Natland expressed concern that color output from FMS would increase the load on publications. Lancelot said that DMP are the experts and they think that FMS is a useful tool on a routine basis. Pyle noted that ODP-LDGO overspent by 10%, probably because of FMS. This cannot continue, so either FMS logging should be discontinued or something else cut. Nonetheless, Leinen proposed an amended motion, which was passed by PCOM:

PCOM Motion

PCOM endorses the use of the Formation Microscanner (FMS) as a standard logging tool.

Motion Leinen, second Moberly Vote: for 14; against 1; abstain 1; absent 0

Austin deferred another DMP action item, that concerning the flexibility of *ad hoc* groups. Worthington said that it had been stated that all panel recommendations must go to PCOM. In future, Worthington proposed to classify recommendations: some for PCOM to consider and others to go to their targets through PCOM.

SMP

Austin highlighted action items arising from the SMP report: 1) endorsement of the use of the physical properties manual, 2) purchase of a second Rock Eval, at a cost of about $60,000, 3) to endorse a core-log data integration plan developed in association with DMP, and 4) to endorse adequate technical support aboard the vessel through the hiring of additional personnel and through no-cost exchange.

Leinen said that the Rock Eval will be essential for safety on Leg 139. It tends to break down and without a backup there is a danger that drilling on sedimented ridges will have to be terminated prematurely. Responding to a question from Natland, Moran said that a lot of energy is expended repairing the Rock Eval; it is relatively new but complex to operate. It is critical and a back-up should be available. Francis added that oil companies normally have several because of down time. Moberly suggested delaying a decision until details on the March 1990 BCOM deliberations regarding purchasing priorities for shipboard equipment could be reexamined (see p. 20). Leinen said that the option to rent had been considered, but that the cost would be $35,000 to $40,000. Suess commented that there are other methods besides the Rock Eval and these should be considered.

Austin asked if there was a consensus on index properties and on core-log integration. Leinen recommended that PCOM endorse core-log integration and require co-chiefs to designate a core-log data integration person within each shipboard party. Duncan said that this could be written into the guidelines for staffing. Moran noted that the task of shipboard core-log integration would be a full-time job. She suggested that PCOM endorse the plan; its implications could be discussed later. Austin said that PCOM endorses the concept of carrying out shipboard core-log integration. Its implementation, in particular ensuring that adequate technical support is provided, will be deferred. Austin asked if PCOM would like to pass a motion on index properties and core-log integration. Moberly said that this could be a consensus, if there is no objection.

PCOM Consensus

PCOM endorses the use of the index properties manual *Recommend Methods for the Discrete Measurement of Index Properties on the JOIDES Resolution: Water Content, Bulk Density and Grain Density* aboard ship. PCOM also endorses the core-log integration plan developed jointly by SMP and DMP. Those panels will develop an implementation strategy.

Thursday, 29 November 1990

Austin announced that PCOM would continue to deal with service panel action items and that the agenda would be changed by moving the STRATCOM report (Minute 876) to a position following the Panel Chairperson's Report (Minute 875).

Austin said that he had verified with JOI, Inc. that $57,000 is in the FY90 budget for SMP-prioritized equipment. The Rock Eval costs $60,000, so there is money available. Austin asked Leinen, as liaison to SMP, to begin the discussion of the appropriateness of endorsement. Leinen said that PPSP has stated that continuous monitoring of gases during drilling on sedimented ridges is a necessity. PCOM should endorse the purchase. Lancelot pointed out that before the Rock Eval was introduced, gas chromatography was used for safety; all options should be evaluated. Francis said that gas chromatography is still used on normal legs, but at high temperatures results will not be meaningful. The Rock Eval gives additional information on maturation. Ball said that the Rock Eval gives a quantitative measure and Francis added that gas chromatography will be used on Leg 139 to measure H_2S in pore waters. Suess said that a second Rock Eval is required as a back-up for safety on Leg 139. Austin noted that the Rock Eval is the top priority of a list of 8 items that SMP would like ODP to purchase (see SMP minutes). Purchase of the Rock Eval would mean that other equipment could not be purchased. Tucholke asked if other needs might arise that have a higher priority, and Moberly replied that BCOM asked SMP to prioritize their list and this has been done. Austin asked if there were any objections to the purchase of a second Rock Eval prior to the sedimented ridges leg. In the absence of objections, this became the consensus of PCOM.

PCOM Consensus

PCOM endorses the purchase of a second Rock Eval prior to Leg 139.

SSP

SSP had requested that PCOM endorse preparation of safety packages prior to PPSP review (including an executive summary). Kidd noted that this is required now, but is not done. PCOM reached the following consensus.

PCOM Consensus

PCOM endorses adherence to the guideline specifying preparation of safety packages prior to PPSP review.

Austin said that SSP had also requested PCOM endorsement of requiring oceanographic reviews of sites as part of the preparation of prospectuses. Kidd said that a review should be carried out even earlier. Von Rad suggested that proponents would be best qualified to perform such studies, but Kidd disagreed, adding that some independent group should be charged with the task. Lancelot said that the review will also include safety and weather and should not be performed, as in the past, by graduate students at ODP-TAMU but by ODP-TAMU staff. Francis pointed out that current-related problems do not arise often, and PCOM may be placing too great an emphasis on this area. Lancelot said that swell is also a problem, however, especially with a long drill string. Austin said that an oceanographic review is the responsibility of ODP-TAMU, but that SSP should flag potential problems if they notice them. Davies said that proponents should provide all possible local data to ODP-TAMU. Austin said that he planned to review proposal guidelines and to include them in the next *JOIDES Journal*, and that he can ask proponents to provide an oceanographic package. Kidd reaffirmed SSP's need for the data.

IHP

IHP had requested PCOM endorsement for provision of sufficient funds to maintain publication schedule. Austin noted that this will result in a base budget increase at ODP-TAMU.

In response to questions from Moberly, Francis clarified the present situation. The plan for FY91 is to publish 6 volumes with existing funds. These funds include a SOE of $172,000, which at the time of BCOM was thought sufficient for publication of 4 average volumes. ODP-TAMU could publish a total of 14 volumes, but this would require an additional sum of about $500,000. At the end of FY90, much progress will have been made in catching up with the publications schedule, but now ODP-TAMU is slipping behind again. A total of 28 volumes will have been published in FY90 and FY91, if ODP-TAMU adheres to the present plan, but 22 of these were published in FY90 and only 6 are scheduled for FY91. Some of the FY90 volumes were published using FY91 funds, since some of the FY90 invoices will arrive in FY91. Becker said that at some point ODP-TAMU should reach a steady state of 12 volumes/year, so that the budgetary impact of funding additional publications should be a single occurrence. Moore said that it would be more likely to impact the budget over a finite period.

Austin commented that publications should not fall behind schedule when ODP is about to be scrutinized for renewal. Tucholke agreed, and Leinen added that the co-chiefs, having been pressed to meet submission deadlines, would be annoyed at subsequent delays. Cowan agreed that the rate of publication should be maintained, but asked where the money would be obtained. Moberly said that the budget has been allocated and that the most that PCOM can do is to make recommendations for FY91. Pyle pointed out that the budget can be altered, but that this would necessitate cuts elsewhere. Shackleton suggested that, if additional funds cannot be obtained, ODP-TAMU publish the volumes in hand and extend the submission deadlines for those still in the pipeline to avoid keeping volumes lying around for long periods. Francis said that this would not help the present situation, and Austin added that PCOM would be criticized for a reversal of policy if it did that. It is important to encourage contributors to meet deadlines; relaxing deadlines is bad. Austin further suggested that PCOM could endorse all efforts by ODP-TAMU to publish under the present strictures and encourage them to request money from BCOM. Jenkyns asked if Initial Reports should be given priority over Scientific Results but Moore noted that this happens by default. Leinen suggested publishing science legs before engineering legs and Moores said that, since the number of pages controls the cost of publication, perhaps a manuscript length limit should be considered. Moore answered that the main problem is ensuring the timely submission of manuscripts. Most of the increases in volume length are the result of more core recovery and larger scientific parties. Responding to a question from Natland, Francis said that the freeze of SOEs must be maintained until the fuel situation improves. Even if the FY91 $172,000 publication SOE is unfrozen, however, it simply allows adherence to the original plan of 6 volumes in FY91. Kappel suggested the possibility of paying some FY91 bills in FY92. Malpas said that gradual increases in the contributions of the international partners could be a source of money which should be considered, because this problem will recur every year. However, Moberly reminded PCOM that NSF is loath to increase international partner contributions at present. Austin said that PCOM feels that the publication schedule should be maintained, and that deadlines should not be extended. There is, however, little financial flexibility at present. He said that the minutes should reflect that PCOM wishes ODP-TAMU to make all efforts to make publication a priority in FY91 (see consensus below).

IHP also requested that PCOM endorse permanent retention of a second manuscript coordinator at ODP-TAMU. Austin said that this also has a budgetary impact on ODP-TAMU. Pyle asked if this was not the plan in any case, and Kappel answered that it was a SOE. Francis noted that each manuscript coordinator looks after 4 legs at a time and has to monitor the reviewers. Austin said that this is similar to the last item, in that ODP-TAMU must continue to consider publication a high priority item. Lancelot suggested that the whole system be examined to find bottlenecks and questioned whether this single action would solve the problem. Moberly pointed out that the purpose of the FY90 SOE was to help the Manuscript Coordinators Office to catch up. Now that they have done so, are they still needed? Austin agreed that there was no need to increase the number of volumes yet to be published. He said that he would like to reiterate what he had said earlier and expressed the following PCOM consensus.

PCOM Consensus

PCOM expects ODP-TAMU to maintain publication a continuing priority in FY91. PCOM will not, however, endorse a specific manuscript coordinator *per se*.

874 SUMMARY OF SCIENTIFIC RESULTS: NORTHEAST AUSTRALIA, LEG 133

Davies began by saying that although he and the other co-chief, J. McKenzie, would place emphasis on different aspects of Leg 133 results, she would endorse his comments. He remarked on the excellent spirit displayed by scientists, technicians and SEDCO personnel. Davies said that he would be interested to hear suggestions from other co-chiefs on how this atmosphere can be maintained on future legs.

The Queensland and Marion plateaus are carbonate platforms adjacent to 2 rift basins, the Queensland and Townsville troughs. Stratigraphy was expected to reflect the northward movement of Australia with superimposed effects of sea-level variation. 16 holes were drilled.

Sediment in both troughs is much younger than previously thought. Abundant dolomitization characterized the platforms. Flow directions of dolomitizing fluids in the plateaus (north to south on Queensland Plateau and south to north on Marion Plateau) are thought to be related to their heat flow regimes. Basement metamorphics of probable Paleozoic age were cored on the northern margin of the Queensland Plateau. Overlying temperate carbonates are abruptly succeeded by a tropical shelf facies reflecting inception of the East Australian Current at around 20 Ma. Drilling also documented the differing tectonic subsidence histories of the northern and southern ends of the plateau. Sea level predictions were confirmed but paleodepths were greater than expected and local tectonics distorted the record on the northern end.

Drilling on the Marion Plateau documented an unconformity at the base of 287 m of lower Pliocene, current-deposited sediment. The unconformity is interpreted to reflect a Miocene sea-level fall of greater than 165 m. The prognosis of platform drowning in the early Pliocene followed by development of the Great Barrier Reef was shown to be incorrect. Further sites adjacent to the reef revealed it to be only between 0.5 to 1 m.y. old. This result is having a fundamental effect on biological theory in Australia regarding the time required for evolution of the gene pool and also the source of the original corals. Existing paleoceanographic models are also affected.

Good correlations were obtained between every measured parameter: lithology, regional geophysics and logging. All correlate and suggest cycles which may be related to sea level. Cycles of alternating carbonate and terrigenous sediment were cored in which low carbonate intervals correlate with seismic reflections. The shape of the susceptibility curve may reflect build-up and decline of the ice caps. It should also be possible to comment on the temporal nature of seismic reflections. Davies concluded by saying that that the leg benefitted from the assistance of SSP and PPSP. Oil companies created the only problems, by asking why, if ODP is allowed to drill in the area, they were prohibited from doing so.

Kidd asked if the cycles could be of glacial, rather than sea level, origin. Davies said that this could be the case on the Marion Plateau but not on the Great Barrier Reef, where lowstand terrigenous sediments and highstand carbonates were recovered. Austin thanked Davies for his stewardship of the leg and his report.

875 REPORT OF THE ANNUAL PANEL CHAIRPERSONS MEETING (PANCHM)

Kidd, the *pro tem* chair, reported on PANCHM (Appendix 8). During the morning session, panel chairs presented concerns of their panels. Concerns common to all were discussed. Items that PCOM had asked panels to address were discussed in the afternoon.

Regarding advertising of upcoming ODP activities, PANCHM recommended that in addition to articles in the *JOIDES Journal*, regular *EOS* articles should be published, clarifying the upcoming ship track and resulting opportunities. There are newsletters in ODP member countries, but something more international is needed.

PANCHM addressed the issue of financial support for panel chairpersons. At present, $1500 is provided for post, fax, etc., but funds for part-time secretarial support are needed. Non-US chairpersons discussed approaching their own funding agencies. Lancelot and Cita-Seroni agreed that the easiest method for non-US chairpersons would be to do that. Kidd said that US chairpersons could ask USSAC for support. Kappel pointed out that nobody has asked. Pyle noted that JOI, Inc. has responded to special requests. Shackleton said that it would be inappropriate to have a procedure for US chairpersons (through USSAC), while non-US chairs face a heavier cost burden.

PANCHM requested that PCOM discuss how to provide increased flexibility in arranging subgroup meetings, particularly those related to technological developments. Austin noted that these are best arranged as extensions of normal panel meetings. Moran said that SMP had requested a meeting of past physical properties specialists to specifically talk about wanting one lab. This does not fit under the workshop umbrella and is not suitable for attachment to a panel meeting; a mechanism is required to deal with such meetings. Austin said that the only way that this can be done at the moment is by opening a line item in the budget, coming to BCOM in March for funding starting next October. Pyle said that the JOIDES Office funds a small number of people/year to attend PCOM meetings; this budget could be expanded. Austin asked if there is anything in the ODP budget for subgroup meetings. Kappel replied that, as long as there is no proliferation of meetings, USSAC can provide a limited amount of support for US scientists to travel to them. Austin noted that nobody wanted a proliferation of meetings, and that such meetings might take the place of normal panel meetings. Suess said that he would put before PCOM, later in the meeting, a request for a Gas Hydrate subgroup of SGPP. Worthington said that most meetings would be predictable; DMP had asked for special meetings twice and both were approved. Moberly, however, pointed out that most panels are supposed to meet only twice/year, but DMP has always asked for 3 meetings/year.

Worthington, however, said that 3 meetings/year have been essential in view of DMP's workload; 2 meetings had been tried but had proved insufficient. Austin said that subgroup meetings should preferably be planned with 3 to 4 months lead time, and appended to scheduled meetings. Such meetings must be handled by the JOIDES Office on a case-by-case basis. As Worthington has commented, the system is in place now. Worthington asked if it was PCOM's view that the number of DMP meetings is excessive; he requested a guideline on meeting frequency. Kidd said that SSP aimed to meet twice a year but that sometimes 3 meetings per year would be necessary. Austin said that this must be left to panel chairs but that panels should not meet more than 3 times/year and should plan 4 months in advance.

Kidd continued the PANCHM report by saying that panel recommendations to PCOM, in panel minutes, are often missed by PCOM and not acted upon. Austin replied that this would not happen during his PCOM chair tenure.

Kidd then moved on to report on the afternoon session of PANCHM, which concerned issues that panels had been asked by PCOM to address. The first concerned feedback of thematic panel reviews to proponents. There was a feeling that thematic panel reviews and review forms do not contain enough information for proponents. Modifications were discussed. Blum is designing a new form. In addition to providing more comments for proponents, PCOM members felt that thematic panels should be more blunt with proponents whose proposals will never be drilled.

Regarding developing proposals mandated by the LRP, thematic panel chairs were reluctant to commit their panels to such work. They felt that they were tracking proposals relevant to their part of the LRP, but that it might be useful to seek proponents for particular themes. Leinen said that PCOM did not ask thematic panels to develop proposals, but requested input on how to generate proposals for themes not represented. Shackleton replied that OHP solicits proposals if a need is recognized. Leinen asked Shackleton if OHP's approach gave the broad base of the community an opportunity to participate. Austin drew PCOM's attention to the exact wording of PCOM's charge to the thematic panels (Agenda Book White Pages, p. 27, minutes of August 1990, PCOM meeting). Austin asked PCOM if there was a role for thematic panels as intermediaries between the LRP and proponents. Moberly suggested advertising the need for proposals which address themes of the LRP. Natland said that there are some LRP themes, such as drilling to the mantle, which would be difficult for an individual proponent to address. Suess agreed with Leinen and Moberly that advertising is preferable to soliciting proponents. Malpas stressed the need to communicate to the earth sciences community what ODP does and plans to do. The circulation of the *JOIDES Journal* is too restricted. A general advertisement or a short paper is needed, perhaps designed by STRATCOM. If this does not produce, OHP's route could be adopted. Humphris said that LITHP advertised in *EOS* to avoid the perception that thematic panels set priorities and write proposals. Shackleton said that he agreed with all that had been said but that it was a matter of scale. Moberly added that it was acceptable to invite someone to put in a proposal.

PANCHM felt that there are gaps in ODP's efforts to address COSOD I themes. Austin said that the JOIDES Office is prepared to put together one or more papers on the change from a regional to a thematic drilling program over the next year.

Regarding "add-on" science proposals, PANCHM felt that the concept should be encouraged to enhance the dynamism of ODP, though it will bring problems for SSP and PPSP. It was felt that proposals should be tied to the track of the vessel and, therefore, that the track must be advertised. Days assigned to such proposals should not exceed 12/FY. This could restrict individual proposals to about 2 days/leg, including transit. All proposals should be mature, not simply letters of intent, and also meet SSP guidelines for data quality, type, etc. Proponents should be charged with visiting the ODP Data Bank at LDGO, at their own expense, to prepare survey packages for PPSP review. Finally, PANCHM felt that proponents should be prepared to serve in the shipboard party. Austin reminded PCOM said that there are two issues: whether PCOM should endorse the philosophy of "add-on" science, and how to put the philosophy into practice. Responding to Lancelot, Kidd said that the only difference between "add-on" and regular proposals is that the former are limited to what can be done in 2 days. Lancelot responded that proponents of "add-ons" should approach the original leg proponents; an individual might be faced with writing a normal proposal for only 2 days. Moberly said that in a sense, however, it is a normal proposal. Co-chiefs will not willingly take time to do something different, so there is a need for a separate review. Mutter made the point that this is not "add-on" but subtraction. Austin agreed that overall leg length will not be increased. He added that part of the discussion addressed whether the "add-on" should be thematically related to the leg. Lancelot said that he would support "add-ons" which involve taking the opportunity to address LRP themes while the ship is in a particular region, but not if the aim is to fill in gaps by addressing second priority items. Austin commented that the "add-on" may involve, for example, extending an existing site to basement, or additional logging, rather than a new site. Kidd said that one extreme is PPSP's preference to limit "add-on" work to holes that have already been surveyed, while the other is is to use the "add-on" system for science which would never be drilled in another form. Austin said that he expected that there would be a large number of "add-on" submissions, perhaps 50 to 100 per year. Kidd, however, replied that since the proposed sites must be close to the ship track, he did not think that the number would be large. He suggested the following annual procedure: 1) November, PCOM sets the ship track; 2) January, publicize the ship track in the *JOIDES Journal* and *EOS*; 3) March, deadline for submission of "add-on" proposals, followed by mail reviews by thematic panel chairs and of favored proposals by SSP chair; 4) June, decision by PCOM. Austin said that this deadline would cut down the "deluge" of proposals. Becker said that this system means that something would have to be deleted from original legs. Francis suggested that 2 days from each leg be withheld for possible "add-ons" and returned to the co-chiefs if no add-on was assigned. Austin concluded this part of the discussion by noting that there would be further discussion of leg length and "add-ons" later in the meeting.

PCOM had also asked the thematic panels to consider deep-drilling test sites. Kidd said that thematic panels could, and would, define generic sites (see TEDCOM report).

The final topic of the PANCHM report concerned panel membership procedures. The requirement of providing PCOM with 2 or 3 names of industry nominees, with their prior acceptance, creates problems since nominees have to get approval from their organizations, a more complex matter than for academic nominees. PANCHM suggested that panels recommend a single industry nominee. PCOM could either accept the nomination or ask for an alternative. Tucholke suggested providing PCOM with a list of names without prior approval, but Austin pointed out that prior approval reduced the time required to effect personnel changes and increased efficiency. Kidd said that a second recommendation was that PCOM clarify the rotation schedule for international partners, about which PANCHM was unclear. Moberly said that it was necessary to ask PCOM representatives of the member countries for such information. Austin added that some panels have suffered catastrophic losses of expertise through regular rotation. Cita-Seroni said that ESF maintains a strict 3 year rotation, Jenkyns added that a 3 year rotation is the policy in the UK, though it is not strictly applied. Malpas said that Canada's rotation cycle is 3 years, and Taira said that Japan's policy is also for 3 years, but that they do not always adhere to it. Von Rad stated that the rotation schedule in the FRG is 3 years and Lancelot said that France's policy was for 3 years, but that it tried not to exceed 4 years. Austin said that the US does not always adhere to its 3 year rotation policy either.

PANCHM agreed that panel chairs should recommend to PCOM when they would like new members to join. Moberly noted that the 3 years begins in January no matter when the panel member joins. Austin highlighted the need to preserve corporate memory. Responding to Kidd's query of the policy of beginning the 3 year rotation schedule in January regardless of the timing of membership, Austin added that as many US members are overstaying their 3 years as are rotating on time.

Cowan raised the issue of conflict of interest, asking whether proponents on thematic panels should be allowed to vote on their proposals. He added that two proponents on TECP left the room during discussion but were allowed to vote. This influences the ranking and is inappropriate. Austin said that proponents have been allowed to be present for discussion on a case-by-case basis, to maintain expertise, but it is inappropriate for them to vote.

876 ISSUES RELATED TO 1993 RENEWAL: STRATCOM

STRATCOM 1

Austin began his report by summarizing the history and recommendations of STRATCOM 1 (Appendix 9). STRATCOM is an *ad hoc* subcommittee of PCOM, formed to examine ways to facilitate renewal and to showcase ODP's accomplishments. STRATCOM 1 (Austin (chair), Leinen, Malpas, Moberly, Pisias) took a long-term view and did not restrict its discussions to the period prior to 1993. Discussion of liaisons with other earth science initiatives led to the subsequent production of a series of one-page supplements to the LRP. The LRP was also examined with a view to focussing its objectives. Based on the LRP, thematic panel white papers and proposals received, the number of themes was reduced from 16 to 6 (Appendix 9). STRATCOM was divided on whether ODP should be a proactive or "top-down" program, with the community getting direction from the advisory structure, or a reactive, "bottom-up" program. At its August meeting, PCOM decided not to focus ODP beyond the scope of the LRP. The LRP had just been published and there was a desire to avoid limiting or degrading its impact. In October, Austin reported STRATCOM deliberations to EXCOM, which expressed sympathy for a more proactive stance prior to 1993. They felt that PCOM should implement the LRP.

Discussion

Moberly said that EXCOM still felt that the LRP should be the scientific basis for renewal. Malpas said that the inevitable result of the change from a regional to a thematic program is a proactive ODP. ODP must, therefore, be more focussed than the LRP and more proactive, though not to the exclusion of "bottom-up" proposals. Austin asked thematic panel chairs to comment on STRATCOM's themes. Suess said that SGPP also came up with 6 themes, but not all are in STRATCOM's list, for example paleo-ocean chemistry and sedimentary mass balance. Humphris said that there is no specific mention of deep rifting or global seismic arrays. Moores noted the absence of sheared margins, oceanic plateau history and plate driving forces and kinematics. Austin commented that no proposals have been received which address the last problem. Shackleton said that STRATCOM's list is good and the correct way to proceed, though a way to change it later should be built in. Malpas said that STRATCOM had before it highly-ranked proposals and these were part of the basis for arriving at the 6 themes. Wording of themes could be changed, but the number of themes should be approximately maintained. Malfait suggested that, to avoid a charge from the community that PCOM is focussing ODP, PCOM should say that ODP is focussed by the proposals received. Malpas said that 6 themes came out of a meeting whose objective was to sell ODP. ODP cannot do everything for everybody. Moberly asked whether the objective was to substitute 6 for 16 or if this was a first phase. Austin replied that STRATCOM initially took a long-term view and that the 6 themes represent the long range plan, not just Phase I. However, Malpas and Leinen pointed out that the 6 themes were produced taking into account Phase I of the LRP and the thematic panel priorities; in trying to sell the LRP, it is necessary to focus, rather than state everything ODP does or plans, but this does not imply an attempt to change the LRP. Natland asked whether, if this is a first phase plan, it is appropriate for a 10 year renewal.

Austin continued that STRATCOM 1 recommendations have been interpreted differently by different STRATCOM members. The mandate was to sell ODP and the feeling was that the LRP was insufficient to do this effectively. Shackleton agreed and Austin added that the goals are fluid and will be reviewed but that something is needed up front. Politicians do not have time to read 16 themes. Tucholke said that the list is fine if its purpose is to target administrators, but much of the scientific community will see that it does not address their interests and will conclude that they can have no involvement in ODP. Austin re-emphasized that the list is based in part on proposals submitted and Malpas characterized it as an executive summary. Austin acknowledged that some PCOM members fear that losing grass-roots support would result in the loss of ODP. Tucholke said that the list needs additions, for example Mesozoic paleoceanography. Cowan said it should be reworded to appeal to land geologists.

Austin said that there are two issues: 1) the desirability of condensing the 16 themes to 6, and 2) the exact wording. Malpas agreed but noted that, if the wording is changed, it must not become too generic. Leinen said that the list is not a summary of the LRP, but a list of highlights. Austin asked if it could be taken as a consensus, with the proviso that some changes in the wording of the list be made, that a condensation of LRP themes is useful. Mutter said that PCOM should not redefine the program in order to sell it, but Austin replied that this was not what had been done by STRATCOM. Moberly said that the LRP had been tied to engineering developments. The engineers need consistent objectives and the LRP gave them some general direction. Some global initiatives are missing from the list of 6 themes. PCOM should avoid giving conflicting directions to the engineers. Lancelot first noted that politicians will not understand terms like "Neogene transect" and added that in order to sell the program, PCOM's response to the 6 objectives should be added, and also some indication as to how the scientific community fits in. Malpas said that PCOM must define the target audience. The grass roots community would all like their interests covered, and the LRP does this. The political audience may simply need the executive summary of the LRP, with its 4 themes. STRATCOM has tried to find a middle ground and this might not be possible. Humphris said that the list could be presented as highlights of the program. She noted, however, that offset drilling, deep drilling and transects are strategies and not objectives. Natland and Watkins agreed with Tucholke that the wording should be changed. Baker said that in order to sell ODP, a discussion of the program's purpose and a simple explanation of the LRP are needed. ODP is broad with broad support and has consequently endured. Condensation of the themes of the LRP is necessary to sell ODP to decision-makers.

STRATCOM 2

In response to the rambling discussion summarized above, Austin concluded by saying that PCOM felt that the emphasis of STRATCOM 1 had been too long-term. Consequently, STRATCOM 2 addressed short-term actions (Appendix 9). STRATCOM members are ready to go out and sell ODP by giving presentations in aid of renewal. One has already been given by Austin in Australia. PCOM members should provide slides, etc. to STRATCOM members for such presentations. PCOM members should also prepare short, popular articles, perhaps based on the inserts in the LRP. Austin called on Moores for additional comments.

Moores said that, in January 1991, the *GSA Newsletter* will be renamed *GSA Today* and published monthly with a tabloid format. Each issue will contain 1 scientific article and 4 slots for such articles are available. As science editor, he proposed that they be reserved for ODP themes, for example global change (Leinen), Hole 735B ophiolites (Malpas), hotspots (Duncan), and accretionary prisms or dolomitization (names in parentheses are PCOM volunteers to serve as authors). The goal should be to highlight universality of interest and why ODP material should be included in every undergraduate educational program. The ship track will also be published. Austin added that the JOIDES Office will prepare an article for *EOS* advertising the FY92 ship track soon after the meeting.

Discussion

Malpas said that he had offered to recast *Geotimes* articles on ODP as a separate volume in Canada. Cita-Seroni added that she recently gave a lecture on the impact of ODP at a large stratigraphy conference in Barcelona. Mutter asked what the next move of STRATCOM would be. Austin replied that he would prefer STRATCOM to remain in existence until renewal. Baker suggested a series of articles in *Science* or *Nature*. ODP would then appear before the broad scientific community. STRATCOM should decide on the type of articles required. Leinen agreed but said that she had received pessimistic comments from *Science* on this issue. Baker responded that the people he had spoken to, at both *Science* and *Nature*, had been supportive. Von Rad said that next year's Indian Ocean synthesis meeting will publish a volume with AGU. Responding to a question from Cita-Seroni, Taira said that a symposium on ODP, that he would co-chair with Austin, is also planned for the IGC in Japan in 1992. Worthington said that, to maximize impact, articles must: 1) have a global perspective, 2) include what was known before ODP, 3) include what is known now, and 4) be generally intelligible. Austin said that he would like to continue the mandate of STRATCOM (Agenda Book white pages,p. 141, and Appendix 8) for 1 more meeting in order to reword themes and sell them to the political audience. The grass-roots audience is covered by the LRP. Tucholke stressed that the grass roots should be kept in mind and Moberly said that ODP should be sold within individual countries. Austin asked if there was a reason for STRATCOM to continue. Worthington joked "only if it meets just before PCOM." There was a general lack of support among PCOM members for another meeting of STRATCOM, at present.

877 JOIDES ANNUAL REPORTS BY THEMATIC PANEL CHAIRPERSONS.

LITHP

The LITHP Annual Report and overheads used at the PCOM Annual Meeting are included as Appendix 21. Concerning progress toward thematic objectives, Humphris said that drilling of a complete crustal section remains a long-term objective. To further progress toward this goal, a Deep Drilling Working Group (DD-WG) was recommended and 4 generic sites for deep drilling selected: 1) zero-age crust, 2) off-axis, 3) passive margin and 4) within a subduction zone. The EPR-DPG was also set up. The alternative approach is offset drilling, and a large number of proposals which would employ this strategy have now been submitted. LITHP proposes the establishment of a WG on offset drilling. The Oahu pilot hole has been scheduled (Leg 136). LITHP recommends that observatory installation be an integral part of the LRP, so that all drilling sites in appropriate locations for observatory installation be equipped with re-entry cones. This requires the site to be located and monitoring of re-entry cone installation.

Highlights from the joint LITHP-TECP meeting were the formation of the North Atlantic Rifted Margins DPG (NARM-DPG) and the commitment to a multidisciplinary approach to mid-ocean ridge (MOR) processes.

Humphris went on to address immediate concerns of LITHP. First of these is the freeze on development of the DCS. LITHP urges that development be continued as soon as possible, since a number of LITHP programs in the next 2 years depend on it. Progress to acquire high-temperature and slimhole logging tools must also be maintained in order to achieve LITHP objectives. LITHP recommends that all equipment necessary to establish the future of Hole 504B be carried on Leg 137. If casing repair is deferred to the science leg, it may mean that the science leg goes to a hole that is not viable. In the event that additional time is available on Leg 137, LITHP's recommendations are given in the minutes of their last meeting (Agenda Book white pages, p. 161). See also Appendix 21.

ODP's success in addressing COSOD I themes will be discussed by LITHP in a 3-page summary addressing 5 themes. LITHP considers that new proposals and technological advances are required in order to implement the LRP.

As for LITHP rankings (Agenda Notes, p. 020, and Appendix 21), Humphris noted that the top three priorities ranked far above the rest. EPR Bare Rock Drilling is a long-standing priority. Hess Deep is exciting and LITHP is gratified by EXCOM's interest. LITHP does not believe that MCS will be helpful in the rough terrain in defining drilling targets, and disagrees with SSP about the necessity for further seismic data prior to drilling. Sedimented Ridges II is a long-term commitment. All sulfide drilling has been deferred to the proposed second leg, since DCS is required. The second leg must happen within 2 years of the first. If there is no second leg, plans for the first will have to be altered. In response to a question from Austin, Humphris said that proponents were not present during discussions but that 1 proponent did vote.

LITHP has suffered a major overturn of members in its last 2 meetings and has lost many of its geologists. LITHP, therefore, wishes one of those remaining to delay his departure until after the spring 1991 meeting.

Discussion

Worthington said that ODP cannot invest further in slimline logging until the DCS has been proven. Humphris said that LITHP simply wanted to stress the need for tools. Responding to Sparks, she said that at the EPR, the goal is DCS penetration of 1500m. Natland asked about plans for deep crustal drilling. Humphris said that the LRP calls for 3 phases: 1) 1991-1993, engineering development; 2) 1993-1996, several 2-3 km crustal holes; 3) 1996-2000, deepening of one hole to the Moho. Feedback from the DD-WG on the timeframe is required. LITHP felt that 1 leg/year could be committed. Francis said that there would be no liner aboard on Leg 137. It would cost about $80,000 and the engineers recommend that the feasibility of cleaning Hole 504B should be verified first. Additionally, all equipment for Leg 137 must be aboard by March and there is insufficient time to purchase the liner, if funds were available. Humphris asked whether the viability of the hole could be ascertained on the first leg. Francis said that it could and that the primary objective of the first leg will be cleaning out the hole.

Addressing LITHP action items, Austin deferred the request for an offset WG and consideration of Leg 137. He added that PCOM is working with FDSN through a liaison. ODP cannot spend much time on the OSN pilot hole until a test of the seismometer system has been performed.

TECP

Moores noted that he was not present at the last TECP meeting, the joint meeting with LITHP. At that meeting, proponents were not present during discussions but did vote. TECP recommendations are given in Appendix 10.

Moores went on to discuss TECP's responses to PCOM's requests. A model site for deep drilling is being prepared by D. Sawyer; land sites are also being discussed. Hole 504B should be logged to the extent possible. If a new hole is planned, a structural geologist should be included in the scientific party to glean structural information from the core. Regarding the LRP, TECP has decided to appoint watchdogs in its thematic areas. TECP will solicit proposals in under-represented areas and preserve unsolicited proposals. Offset drilling should test tectonic controls and various tectonic models. TECP considers "add-ons" to provide good opportunities for obtaining basement samples and stress measurements.

TECP concerns include the quality of structural presentations in proposals: balanced cross-sections are needed. Papers on this subject and also on models of the tectonic evolution of ridges are being developed. An additional concern is the narrowness of proposals from a tectonic point of view. Moores concluded his report with a list of TECP nominees; all have agreed to serve.

Discussion

Mutter requested clarification of concerns regarding narrowness of proposals. Moores said that many proposals would be in areas of TECP interest if tectonic problems had been addressed, but proponents often have no tectonic expertise. Proponents should be asked to broaden themes addressed by their proposals. Tectonics is a young theme in ODP, there is little oriented sampling and, therefore, few tectonic proposals. Natland said that historically proposals have been submitted by people with focussed interests, and the panels need to provide helpful and specific criticism. Taira commented that a clear picture of the tectonic framework would benefit most proposals. Responding to Mutter, Moores said that tectonics have been partially addressed in the Hess Deep proposal, but that there is a need to understand the sequence of displacements that produced offset exposure. Tucholke and Cita-Seroni stressed that TECP has been very fair to proponents in drawing out tectonic interest in proposals and offering helpful comments. Responding to Austin, Taira (the PCOM liaison) said that proponents voted on proposals unless the vote was close, in which case there was additional discussion. Moberly and Austin emphasized that proponents should not vote and should not be in the room during discussions, though the latter restriction had been softened for one panel. Moberly noted that SGPP allowed proponents to vote for proposals other than their own.

SGPP

The SGPP annual report is summarized in Appendix 11. Suess said that SGPP had focussed on Pacific proposal review at its 2 meetings in 1990. The SGPP white paper was published in the June issue of the *JOIDES Journal*, and included a wish-list of desirable instrumentation and measurements. J. McKenzie will be the next chair. SGPP is concerned about maintaining a balance between geochemists and sedimentologists during upcoming membership rotation.

Three meetings have been requested for 1991. At SGPP's fall meeting, proponents did not vote and were absent from discussions, though this was restrictive.

SGPP suggested modifications to the Cascadia Accretion, Chile Triple Junction (CTJ), and Peru Gas Hydrate (PGH) proposals (Appendix 11). Responding to PCOM requests, SGPP discussed preferred options for the use of any available time at Hole 504B (Leg 137), suggestions for panel-driven drilling, deep drilling, showcasing ODP and "add-on" science. Suess concluded with a list of concerns (Appendix 11).

Discussion

Responding to Cowan, Suess said that a generic gas hydrates leg is envisioned as a combination of the PGH proposal and half of the CTJ proposal into one leg. Cowan noted, however, that the new CTJ proposal contains a gas hydrate component. Taira said that fluid processes appear to dominate the ranking and questioned the absence of Atolls and Guyots (AG) and the sea level theme. Natland felt that such modifications at this late stage would be confusing.

Austin brought the discussion to the action item concerning technological developments, in particular the Pressure Core Sampler Phase II (PCS II; see Appendix 14). Francis said that the present PCS tool will be modified to produce PCS II. The Sedimented Ridges leg (139) will have to use the phase I tool. PCS II will be ready for a gas hydrates leg at the end of 1991. Tucholke stressed the need to measure heat flow, and not just to derive it from modeling. Moberly said that the package to extract core from the PCS II awaits work by Brass and Kastner; ODP-TAMU has done all it can. Moran commented that ODP-TAMU cannot design a tool without a plan from the scientific community. Responding to a question from Tucholke, Suess said that thermogenic bacteria will be studied along with the gas hydrates themselves.

Concerning the second action item, Austin felt that it was the responsibility of the outgoing chair to make the new chairperson aware of his or her responsibilities. Austin said that he might approve a SGPP meeting to discuss BSRs/gas hydrates and attended by liaisons from PPSP, but that he would need a letter of intent and an agenda. He deferred further discussion.

OHP

The OHP report is outlined in Appendix 12. Shackleton reported that OHP supports the idea of "add-on" proposals, recommends the cessation of whole-round sampling, that the ship track and other information be published outside the *JOIDES Journal*, and expressed concerns about manuscript handling. OHP's major concern is that if the highest priority theme for the first portion of the LRP is not being addressed by sufficient drilling legs, there is no chance to get to other themes. OHP strongly supports the Santa Barbara Basin site as an "add-on objective" (Appendix 12). Shackleton concluded his report with a discussion of panel membership changes. OHP would prefer not to rotate any members before its next meeting (Appendix 12).

Discussion

Kidd raised the issue of environmental concerns in the Santa Barbara Basin. Francis, referring to OHP's proposal that a start could be made on Eastern Equatorial Pacific (Leg 138) drilling if sufficient time was available on Leg 137, noted that OHP's preferred Leg 138 site (EQ4) is in Ecuadorian waters and would require clearance. Another site would be preferable.

878 REPORTS OF DETAILED PLANNING GROUPS

EAST PACIFIC RISE

Davis passed round copies of the EPR-DPG report. The recommendations are summarized in Appendix 13. The zero age crust objective requires only shallow drilling, but the approach to a magma chamber may require penetration of 1500 m. The axial magma chamber reflector is broader, and a better target, at 9°30'N. Location of Site EPR 1 is based on the consensus that least technical difficulty would be encountered there. EPR-DPG estimated that items 1 to 4 under under Drilling Strategy (Appendix 13) would require approximately 5 legs at suspected DCS drilling rates. EPR may not be the best place to pursue item 5. Only items 1 and 2 of the Site Survey Requirements (Appendix 13) are required before final site selection; the aim of item 2 is to identify and avoid rubbly sections. Items 3 to 7 may be carried out in parallel with, or following, drilling. The second of the Priorities for Drilling (Appendix 13) depends on the success of the DCS to meet the criterion of >50% core recovery. If this objective cannot be met, a full logging suite will be required, perhaps necessitating reaming. The Tentative EPR Operations Schedule (Appendix 12) is for the first of a possible 5 legs. Contingencies include drilling EPR 2 as a viable alternative to EPR 1, and being prepared to ream if DCS core recovery is low. A re-entry cone seal should be left in place, or the hole grouted.

Discussion

Sparks questioned the plan to ream the DCS hole, since the API-BHA is cemented into the hole. Worthington said that reaming is necessary because, although logging tools would fit inside a 4 inch pipe, they would not fit within a 4 inch hole. Malpas questioned the need for both EPR 1 and EPR 2 if they are interchangeable. Davis said that EPR 1 and EPR 2 are both required in case the DPG's intuition is wrong. They are not interchangeable, however: EPR 1 is outside the axial rift graben (in possibly annealed formations) and EPR 2 is within the axial rift. Both are important for fluid circulation studies. Responding to Duncan, Davis said that the seafloor comprises flows, probably with flat slopes. Moores commented that the local structure may be asymmetrical (a half graben).

Francis said that practice in coring with DCS is the most important priority. He added, agreeing with Sparks, that he was not sure how a hole can be reamed through a BHA. Natland said that a test of the drill-in BHA should be included in the drilling plan. Moberly said that the first EPR leg is supposed to combine engineering and science, and Jarrard asked that ODP-TAMU inform ODP-LDGO if it thinks that there will not be enough time for logging so that ODP/LDGO does not waste time in preparation. ODP-TAMU must also consider how to ream the hole. Responding to Mutter, Davis said that the location of EPR 3 was selected partly based on the scale of the velocity anomaly. Mutter cautioned that the velocity anomaly was not corrected for anisotropy. Davis told Worthington that temperatures are unknown. Worthington said that the DPG's tools list is bigger than DMP felt was achievable. Slimhole tools will be difficult to insulate, but if reaming is possible, off-the-shelf tools can be used. Austin said that the most up-to-date ODP-TAMU feelings about reaming are needed. Davis replied that M. Storms of ODP-TAMU considered the DPG ideas to reflect the latest ODP-TAMU thinking. Francis said that ODP-TAMU is assuming no hydrothermal problem at EPR 1, so that the DCS can be tested. Humphris noted that LITHP had removed an engineering step and added 8 days of coring in response to Storms. Austin thanked Davis for his report.

CASCADIA

Cathles began his report (outlined in Appendix 14) with a summary of the importance of fluids at accretionary margins. Fluid venting can be diffuse or fracture-dominated, also continuous or episodic. The Cascadia (CA) leg is a fluid flux leg with important implications for sedimentary basins and metamorphic terranes. Fluid flux in the Vancouver Island (VI) area is mostly diffuse, though probably with some fracture flux, while that in the Oregon Margin (OM) area is fracture-dominated, with subordinate diffuse flow. At VI, 3 holes are proposed to obtain 3 estimates of diffuse expulsion based on: 1) horizontal porosity gradient, 2) second derivative of temperature with depth, and 3) concentration of methane in pore fluids above, below and within the presumed clathrate layer. At OM, measurement of flow through 4 faults is proposed. The concentration of methane in each fault will be measured using a barrel on known vents and faults will be cored to study the history of fluid movement. One hole will be drilled through an up-bowed clathrate layer as an independent measure of fluid flux. The frontal thrust site is the most important. Fluid flow along landward-verging faults is sourced from the underlying basalt, in contrast to seaward-verging faults where fluid flow is sourced from the prism. Temperatures will be measured as a function of depth and time in a number of ways (WSTP, 6 log runs, thermistor string), and pressure will be measured using packers, Geoprops, and will be monitored over time. A proposed follow-on CA leg would focus on OM, with additional reference holes and studies of proto-deformation and the frontal thrust, but include non-hydrate VI drilling. Cathles concluded his report with a summary of specific issues concerning CA drilling and a list of advantages of the CA program.

Discussion

Responding to questions from Natland and Malpas, Cathles said that the focus of the proposed program is on processes. Therefore, assigning drilling on VI and OM to separate legs would mean that an overview would be delayed for 2 years. Cathles felt the program addresses fluid flow squarely and without compromise. Even if a second leg were guaranteed, the present plan would still be the preferred approach. Responding to Taira, Cathles said that clathrate affects seismic velocities and porosity estimates from such velocities. Drilling is, therefore, necessary to check seismic data.Cowan questioned the inference that fluid sampled by drilling is the same as that escaping at the surface; Cathles noted that this is the case, on land, in New Zealand. Leinen characterized CA as a program to study instantaneous flux, downplaying tectonics, and asked what, given the current-related problems at Nankai (Leg 131), would be the likelihood of success with measurements that depend on recovery in particular intervals. Cathles responded that there is a connection between fluid expulsion and tectonics; results will also have tectonic significance. He added that there are no currents at the CA sites and that no problems with unconsolidated sediments or swelling clays were encountered at Site 174, previously drilled in the area. He noted that clathrates tend to enhance cementation. Cathles agreed with Leinen, however, that recovery at Site 174 was poor and, furthermore, that it would be useful to discuss the suitability of Site 174 as a reference hole with people familiar with that hole. Watkins pointed out that neither Geoprops nor packers are yet working, but Cathles said that samples can be obtained in other ways. Natland asked if the DPG had considered that fluids in rocks of differing porosities and strengths might respond to processes in different ways. Cathles replied that it had not, but that there is a large decrease in porosity with depth and most activity occurs in the upper layers. Deeper, basement-derived fluids will be studied in the hole at a landward-verging fault. Cowan, however, noted that the latter statement represents a hypothesis.

879 STATUS OF ENGINEERING AND TECHNICAL DEVELOPMENTS

ODP-TAMU

Francis presented engineering aspects of upcoming legs (Appendix 15), beginning with Leg 135. Drill-In Casing with Funnel will be used on this leg. It permits the establishment of a re-entry cone at lower cost ($15,000 vs. $50,000). Tripping pipe is avoided. The system will probably sink into the sediment eventually, but is sufficient for pipe trips to change bits on this leg.

Leg 136 will employ the prototype borehole plug (Appendix 15). The plug cannot be used in existing re-entry cones, but requires a modified cone costing about the same as the standard cone. The plug is about 20 ft long, with a maximum diameter of 20 inches and a weight of about 1.5 tons. It costs about $30,000. The data logger will not be on Leg 136 and a dummy will be used. The hole will be pumped to 200-400 p.s.i.; if the pressure holds for 15 min., the plug will be assumed to be working.

Leg 137 involves preparation of Hole 504B. A rented electromagnetic thickness inspection tool and multi-finger caliper will be aboard. The 60 day tool rental is at a rate of $100/day and a cost of $5000/run/tool. The German digital borehole televiewer will be used. The milling tool (Appendix 15) will be employed to grind up junk but, as mentioned earlier in the meeting, no liner will be carried.

Leg 138 (Sedimented Ridges) may encounter high temperatures, acid fluids and high concentrations of H_2S. Well-tried systems will be used for drilling. Effects of borehole fluids on equipment will be considered. Steel is subject to sulfide stress cracking, seals may not resist high temperatures, and liners will be changed as the temperature increases, with metal liners above 170°C. Downhole temperatures will be measured to ±10% using heat tabs and a heat-sensitive crayon. H_2S content of the pore water will be monitored using gas chromatography. H_2S in the atmosphere is a major safety concern and H_2S monitors will be installed. There will be a training session on H_2S safety before the ship sails. If required by Canada, a H_2S consultant would cost about $50,000. Steam flashing will not be a problem. If the well starts to flow, a valve can be closed or mud pumped.

Leg 140 or 142 will employ the DCS Phase II as used on Leg 132 (Appendix 15). It is a slow system which would limit coring to 300-500 m in a single leg. DCS II incorporates a platform occupied by 3-4 people 40 ft. above the rig floor. This is a safety concern and a slingshot test on land at a cost of $170,000 is required to investigate motion of the heave compensator should the drill string break. In response to a question from Mutter, Francis said that there is an anti-slingshot system on the heave compensator, but if the test by Draco shows that the system is dangerous, DCS II would have to be abandoned. Natland said that the system was not tested prior to Leg 132 as there was insufficient time. Sparks noted that the actual heave compensator on the ship will not be tested. Responding to Austin, Moberly and Tucholke, Francis said that the cost of the test is covered within the DCS budget, but that development of DCS Phase III, with all personnel on the rig floor, will require much more expenditure. DCS II is scheduled for use on the first EPR leg, but ODP-TAMU is uneasy about hydrothermal drilling with the DCS II because of blowout danger. Austin noted that this was the first time that PCOM had been informed of a safety restriction on penetration with the DCS II.

Humphris requested information on the timing of Phase III. Francis replied that no funds are available this year for work on DCS III. If the fuel price situation is resolved, DCS II drilling on the EPR can go ahead. DCS III is the long-term objective; it may not be available for a second EPR leg. Sparks added that the feeling of TEDCOM at its last meeting was that DCS III is 4 years away. Davis noted that use of the DCS for hydrothermal drilling forms the core of the Sedimented Ridges program and is essential for the deeper EPR objectives. Leinen asked if there could be no deep penetration. Francis replied that slowness of the system is also a problem, but for safety, 1500 m at the EPR is excessive; 600 m will probably be the limit. Duncan, however, said that in a worse-case scenario the temperature gradient could be even higher than expected. Pyle said that these are major changes compared to what PCOM heard at its August meeting and he reminded PCOM that DCS is critical to renewal.

Sparks cautioned against over-dramatizing the situation and referred to the TEDCOM minutes (Agenda Book white pages, p. 102-104) for an account of DCS status. Austin, however, agreed that PCOM was now receiving a different perspective. Responding to a question from Sparks, he said that PCOM was told that in order to speed up development, additional funds, an alternative platform and continuous testing were all needed. When PCOM decided to test DCS next at a site of scientific interest, these new concerns were not raised. Francis said that he, too, had only learned of the safety problem in the last few weeks. Moberly said that PCOM must take into account the advice of its advisory structure, for example TEDCOM. Cita-Seroni said that, at the August PCOM meeting, Storms had expressed uncertainty, and he had wanted an additional DCS test on Loihi Seamount. His opinion was changed by PCOM after discussion. Austin, however, said that concerns at that time were about drillability and not safety.

Natland suggested telephoning the ODP-TAMU engineers for further information. Austin said that if the proposed Sedimented Ridges and EPR programs cannot be tackled because of DCS concerns, this affects FY92 Pacific planning. Responding to Moberly's suggestion that PCOM accept the guidance of its advisory structure, Austin asked Sparks if he would advise drilling under the circumstances discussed. Sparks responded that he was not competent to make such a decision. It was agreed that Austin, Francis and Natland would telephone ODP-TAMU for additional information.

Francis continued his report by addressing the status of tools used on legs 133 and 134 (Appendix 15). The Vibro-Percussive Corer (VPC) was not a total success. J. Pheasant, an engineer from the British Geological Survey who was on Leg 133, could not be sure that the VPC was vibrating. He will do further work in the UK. The Motor-Driven Core Barrel (MDCB) is a re-design of the old Navidrill and was tried on Leg 134. There were 2 successful deployments: the first recovering 24 cm of core in 14 min., and the second recovering 2 m of core in 60 min. A load of about 10,000 lb on the XCB bit is required to provide a reaction for the MDCB. This will result in penetration of weak formations and the MDCB may, therefore, be unsuitable for drilling through chert nodules in chalk. This is a disturbing implication, since the MDCB is required to cut a clean hole in weak formations for the Geoprops probe. The Sonic Core Monitor (SCM) has been run 10 times, yielding a couple of good runs. The tool is theoretically viable, but the electronics package is not robust. The Adara heat flow tool is fitted into the shoe of the APC. It has been tested a couple of times, but the software requires work, and Francis could not, therefore, comment on its success.

Responding to questions from Leinen and Becker, Francis said that Geoprops cannot be used without the MDCB and also that formations can be too hard to use the APC and yet still too soft for MDCB. Davies said that the VPC on Leg 133 was not really a success. The engineers could not be sure it was running. It should be land-tested, but is potentially a good tool.

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879 (continued) Further discussion of DCS II following telephone conversation with ODP-TAMU engineers

Austin, Francis, Natland and Sparks spoke with B.Harding and S.Howard, engineers at ODP-TAMU, before the meeting reconvened. Austin said that concerns arise from more complete evaluation of Leg 132 DCS II results than was available to Storms, who had reported to PCOM in August. At several points during drilling on Leg 132, self-induced blowouts occurred; (cool) drilling fluid came up onto the platform. The difficulty of evacuating the platform would lead to a safety problem in the event of the fluid being hot. A tubing blowout preventer on the platform may solve this problem, but the problem of H_2S remains. DCS II is unsafe where there is substantial H_2S, because of the difficulty of evacuating the drilling platform quickly.

Austin reported that ODP-TAMU engineers suggested employing DCS II at the EPR. High temperatures may be encountered at 100-200 m, but these can be handled better than H_2S. Because of the potential H_2S problem, it would be irresponsible to schedule Sedimented Ridges II in FY92 without knowing results of Sedimented Ridges I (Leg 139). The main modification involved in development of DCS III from DCS II is moving all personnel to the rig floor. With an investment of $1-1.5 million, DCS III could be ready in 18-24 months. At least 1 field test would be required. Duncan said that DCS III is needed for deep drilling on the EPR. Austin agreed, adding that the engineers want to go to this next step.

Natland reported that the slingshot test is necessary because only part of the heave compensation system was tested prior to Leg 132. The test damages equipment and insurance is required. If DCS II was only going to be used on 1 more leg, the test would not be considered necessary and the money saved could be invested on DCS III development. However, DCS II will probably be required for 2 to 4 legs before DCS III will be available. Austin concluded by reporting that the engineers see DCS II as not compatible with existing scientific objectives. Humphris asked if ODP-TAMU would go ahead with DCS III even before DCS II had been tested further. Austin said that they want coring experience with the DCS II system on the EPR.

ODP-LDGO

Jarrard began his report (outlined in Appendix 16) by stating that only 2 of the next 7 legs will use ODP-proven logging technology, but he expressed cautious optimism about most technological developments. Leg 136 is a test of the digital, high-temperature Borehole Televiewer (BHTV); a high-temperature tool is not needed on that leg. BHTV is now scheduled for use on Leg 137. Jarrard commented that a massive influx of funds would not have changed the pace of tool development. Pyle noted that Gable has not agreed to meet any deadlines for supplying a French version of a tool to measure formation temperature.

Jarrard said that reaming has been listed as a possibility during Leg 140. He said that ODP-TAMU accepted responsibility for widening DCS holes. The EPR-DPG wants reaming at EPR-1 and ODP-TAMU should tell PCOM, at its next meeting, how this can be done. Francis said that reaming of DCS holes has not been considered and will be a post-DCS III development. Jarrard replied that reaming at the EPR may then have to await a later leg, and not be carried out on Leg 140. Francis said that the drill-in BHA may be a nested system, and its innermost pipe diameter will determine the size of the reaming tool. Natland noted that the standard BHA in its present configuration will allow logging and reaming. Francis said that there are three different BHA options for EPR drilling, ranging in cost from $0.7 to $1.2 million. The least expensive is the Leg 132 system, the most expensive is a nested system. Natland added that DCS development will be evaluated in December, 1990. The minimum diameter of hole that will allow use of off-the-shelf tools should be a factor in design of the BHA. Jarrard said that a 4 inch hole would be too narrow, unless conditions were ideal (i.e., a "rifle barrel" hole). A logging attempt would be worth trying in a 5 inch hole. ODP-LDGO needs to be informed of ODP-TAMU's plans in order to factor in costs and time requirements. Responding to Austin, Francis said that the 3 BHA options can be available for EPR (Leg 142), if money is available. The cheapest, modified Leg 132 BHA is not ideal; ODP-TAMU would prefer smaller-diameter BHAs. Francis did not know the innermost internal diameter of the expensive, nested option. Austin asked if PCOM should make a statement endorsing ODP-TAMU's desire to gain experience and advising them to optimize arrangements for logging. Moberly noted that PCOM has previously said that ODP-TAMU is responsible for enabling conventional logging runs to be made.

Jarrard moved to technology needs. There are no major technological implications of the potential FY92 programs except Sedimented Ridges II, which will require high-temperature, slimhole logging capability. Such tools do not exist. Jarrard drew attention to risk estimates for potential FY92 programs (Appendix 16). Sedimented Ridges II and EPR have only a 30% estimated chance of success and Cascadia is intermediate. Cascadia logging could be carried out if ODP is prepared to lose tools and a BHA. Responding to a question from Mutter, Francis said that ODP-TAMU has no money for development of slimhole, high-temperature fluid sampling. Los Alamos (LANL) and Sandia laboratories have worked for many years on the problem, but there is still no perfect tool. A representative of LANL is scheduled to participate in Leg 137 to test their tool; LANL's tool is the only one with a small enough diameter to permit use with the DCS. Its temperature limit is 350-400°C. If the test is successful, the tool will be tried on Sedimented Ridges I, where high temperatures may be encountered. Responding to questions from Mutter and Moran, Jarrard said that the estimated probability of success at Hess Deep should perhaps be 80%, rather than the stated 70%, but that ODP-LDGO is not sure how clean the hole will be. The optimistic ranking of Cascadia is based on the new SES and an aggressive logging program (i.e., being prepared to lose tools).

880 DETAILED PLANNING INFORMATION FOR PACIFIC DRILLING

Austin instructed PCOM that they must decide on a schedule for approximately mid-November 1991 to October 1992,when the ship is scheduled to depart for the Atlantic. The departure date represents the "preferred scenario", so there is some flexibility. The ship may return to the Pacific in FY93. FY92 program should comprise 6 legs or 5 legs plus an engineering leg. He called on PCOM watchdogs to give short presentations on programs in the Pacific Prospectus.

ATOLLS AND GUYOTS

Tucholke listed objectives of the program as: 1) mid-Cretaceous to early Tertiary sea level history, 2) the "paradox" of reef drowning, 3) vertical tectonic history, 4) paleolatitude, 5) basalt geochemistry, 6) facies anatomy of reefs, and 7) acoustic stratigraphy and diagenesis. He went on to describe thematic panel rankings (Agenda Notes p. 20-25).

There are two proposals, 202/E(Rev) focussing on the Marshall Islands, and 203/E(Rev), with sites primarily in the Mid-Pacific Mountains. A major episode of edifice formation and drowning took place in the mid-Cretaceous, in addition to younger events. In the Marshall Islands the proposed sites comprise 2 archipelagic sites to address sea-level history and highstand input of turbidites, 5 guyot lagoon and fringing reef sites and 1 pelagic cap site (Appendix 17). In the Mid-Pacs, drilling will test a hypothesis relating to the formation of 3 types of guyot, atoll, volcanic and barrier reef. The hypothesis proposes that their formation is the result of motion of the underlying plate relative to the Darwin Line. Most drilling in both proposals is planned for the lagoonal environment to take advantage of high-resolution stratigraphy provided by coccoliths.

Discussion

In response to a question from Becker, Tucholke said that DCS offers the best chance of decent recovery in the reefal environment. Shackleton, clarifying the views of OHP, said that OHP does not regard this as a sea level program and, therefore, there is no need to wait for a report from the Sea Level Working Group. The Mid-Pac proposal is the highest-rated proposal addressing Mesozoic Ocean history and the vertical tectonic history of the Pacific. Jenkyns added that there is also a black shale component to the program. Austin commented that the Atolls and Guyots (AG) program appears to have fallen from favor. Suess replied that it represents 1 of 2 strategies for sea-level studies, the other being the continental margin approach. Both strategies should be employed. There are two purposes of AG: 1) to obtain general scientific benefits, and 2) to test the sea level strategy. Shackleton did not think that this is the best location for a sea-level program, but that this is not primarily a sea-level program. Watkins, however, said that a central Pacific study is essential for global sea-level correlation. Von Rad said that global paleoceanographic history should also be stressed. The Cretaceous climate may have been less equable than previously thought, with possible Albian cooling, perhaps related to anoxia. Cita-Seroni asked if objectives could be combined into a single leg. Tucholke replied that each proposed leg is about 58 days long. It would be possible to design 1 very good leg if a decision can be made on the most important objectives. If sea level is considered the priority, the leg would differ from each existing proposals.

Leinen asked if OHP rankings would have been different if the Mesozoic/non-Mesozoic balance on the panel had been different. Shackleton said that it would certainly have differed, since OHP presently contains a majority of Neogene workers. PCOM, however, organized the panel this way in terms of the LRP. Suess said that SGPP had tried to combine the proposals but the result was 1 proposal with 2 parts. The Mesozoic paleoceanography and sea-level themes are difficult to combine. SGPP's primary interest is in sea level. Moores said that if TECP had contained a proponent, AG would have been rated more highly. Tectonic elements should be kept in mind and holes extended to basement. Tucholke said that he disagreed with Suess and that the same objectives occur in both proposals. A designer program based on both is feasible. Both are drillable with the *JOIDES Resolution*. Humphris said that LITHP ranked the program sixth out of six because this is not the way LITHP would choose to study the DUPAL anomaly. Shackleton observed that AG is OHP's highest-ranked Mesozoic leg.

BERING SEA

Lancelot reported that the Bering Sea is an isolated fragment of the Kula plate of uncertain, but possible Cretaceous, age. The proposal advocates drilling at 3 locations: the Umnak Plateau, Sounder Ridge and Shirshov Ridge, to address: 1) Neogene climate and paleoceanography, 2) Paleogene and Cretaceous environments, and 3) Structural and tectonic history of the Bering

Sea. There is a great deal of oil industry data in the region. Austin noted that a USSR proposal on the Shirshov Ridge has been received by the JOIDES Office including some seismic data. Lancelot continued, pointing out that the Neogene study may fill in a gap in high latitude climatic studies. The late Neogene section is not calcareous but the proponents think that there will be an underlying calcareous section. Most pre-Neogene oceanic sediments globally have been subducted and the record is, therefore, poor. However, existence of a good Cretaceous section in the region is uncertain.

Discussion

Suess said that the absence of calcareous micro-organisms is interesting in terms of the ocean-wide silica budget. Natland asked if the Cretaceous section can be reached with less than 1000 m of drilling and added that a re-entry site may be necessary. Lancelot replied that casing may be required and a re-entry site might be preferable. Francis said that this program is difficult to incorporate with other objectives, because it has a July/August weather window. Moberly noted that the proponents had always said that the Shirshov Ridge component would be enhanced by Soviet data. The possibility exists of low returns, but if objectives can be met scientific returns would be great. Von Rad said that existing proposals would be more mature if the USSR was a participant, but Austin said that this only applied to the Shirshov component.

PERU GAS HYDRATES

Taira noted that little is known about Bottom Simulating Reflections (BSR). The program (PGH) would study the physical composition of the BSR (gas, water, solid), its chemical composition (CO_2, salinity, C_2H_6...), and its mechanism of formation (saturation level) (Appendix 18). The BSR is strong at anticlines and fades st synclines. In response to a question from Tucholke, Cathles said that it is hypothesized that the clathrate nucleates, by an unknown process, and that there is subsequent equilibrium exchange between hydrate and fluid leading to the growth of clathrate. Continuous flow through the clathrate is plausible. If concentrations above and below the clathrate differ and the layer itself grows, this provides a mechanism for recording the amount of fluid passing through the clathrate.

Discussion

Suess said that the old interpretation was that free gas existed below the clathrate and that drilling was unsafe.The new (Hyndman) model depends on the mechanism that hydrates can grow from an undersaturated solution in the absence of free gas, and that they are, therefore, safe to drill. However, the lower level of saturation is unknown, and it is necessary to assume that there is no differential motion between gas and water. In the Peru location, as opposed to CA, it can be confidently assumed that the gas is of purely biogenic origin and that there is no hydrocarbon reservoir.

Jenkyns asked if the same objectives could be fulfilled by drilling at CTJ. Taira said that the advantage of Peru is that the system is simple, with purely biogenic gas and simple structure. Cowan noted that there is possible redundancy between this program and CA drilling off Vancouver Island. Taira, answering a question from von Rad, said that there are no estimates of the time required for Peru drilling, but it would probably involve at least a third of a leg. Cathles responded to Cowan's earlier comment by saying that it would take more time to achieve these objectives at CA. The BSR study is embedded in a larger program at CA. Francis said that CA sites are in shallower water and less safe if gas is present. Seismic resolution there is limited and a gas layer could be missed. Davis, however, said that gas layers can be resolved off CA by velocity moveout/Poisson's ratio. Shackleton said that the strategy at Peru requires 3 ocean history holes to be drilled, while geochemists examine results from the first hole. OHP could not rank the program highly on the basis of what was presented in the proposal.

Austin reminded PCOM that Suess is a proponent. He was comfortable with allowing proponents to remain as information sources, yet PCOM is on record as not allowing this at thematic panel meetings. Tucholke suggested that proponents leave during discussion and return for questions. Malpas agreed, adding that it is difficult to prevent proponents from making a case. Austin said that in future proponents will leave and return after the program has been discussed.

SEDIMENTED RIDGES II

As a proponent, Davis left the room. Mutter said that Sedimented Ridges I (SR I) has been planned with a hydrothermal focus while SR II is to focus on massive sulfide deposits. Middle Valley, the faster spreading center, is scheduled to be drilled on both legs and the Escanaba Trough, where spreading rates are lower, only on SR II. The focus of the hydrothermal study is on type B holes (see Pacific Prospectus), and all but the deepest are scheduled for SR I. Mutter said that on SR II, the intention is to drill into sulfides and, given the safety concerns about the DCS II previously expressed, this cannot be accomplished in FY92.

Discussion

Francis noted that drilling of sulfides cannot be done with the current DCS, but may be possible using other methods. Malpas said that only DCS could give good recovery, but Francis said that DCS is slow and, with other methods, more core may be obtained, though at lower recovery rates. Humphris commented that experience suggests that recovery would be very low with normal drilling. Mutter said that, except the deep hole, most objectives are already on the schedule for Leg 139, including many holes in sulfides. Malpas asked how SR I would be modified if DCS is not available, and Davis returned to provide information. He first said that there was a need to ensure that sulfide geologists get samples and maintain their interest in ODP. All sulfide mound drilling using DCS drilling was moved to SR II for logistical reasons. If SR II does not take place, some mound drilling with modification of standard technology would be attempted on SR I. This would provide some information on permeability, temperatures and flow rates so that ODP-TAMU engineers can better evaluate risks associated with DCS drilling in this environment, perhaps with a view to proceeding with SR II at some future date. Deepening of hole MV-3 would have to be abandoned, among other things. Humphris asked if DCS could be used for sulfides if there was no active venting and H_2S. Austin said that the engineers want to learn about the environment in the vicinity of sulfides, and Davis replied that the plan is to work up toward the high-temperature situation. Responding to Cathles, Davis said that sulfide drilling has hydrological objectives, in addition to the primary petrological objectives.

Austin highlighted the SR-DPG recommendation that SR II follow SR I by no more than 1.5 to 2 years. DCS III is at least 1.5 to 2 years away. He asked Davis how long SR II could wait if SR I is left unchanged. Davis answered 5-10 years, scientifically, but the shorter time frame was thought necessary to maintain the support of the geological community. There is no technological necessity for a quick return. Austin then asked if a modified SR I would be preferable for maintaining community interest, as opposed to PCOM merely expressing its intent to schedule a follow-up leg. Davis said that he was not familiar with all engineering constraints, but if there is a reasonable chance of success in sulfides using present techniques, he would prefer to alter SR I. Suess said that he understood that downhole instrumentation would require a return to the sites, but Davis said that this would not require the drillship. In answer to a question from Becker, Davis said that sulfide drilling in Middle Valley had been rescheduled to SR II and deepening of MV-3 had been moved to SR I, placing all sulfide drilling on SR II, prior to DCS safety concerns. Now deepening of MV-3 would probably be pushed back by the co-chiefs of SR I to SR II.

Responding to Mutter, Davis said that modeling suggests that if a hole is drilled into a closed hydrothermal system, it will disturb that system. Also there can be mixing of fluids within the hole. The model requires high permeability, whereas the actual permeability is low. Because surface samples are not representative of what exists at depth there is still a need to drill. Casing the hole will prevent leakage of formation waters. Mutter said that downhole measurements of temperature, pore pressure and permeability and also downhole fluid sampling are considered essential to the success of this proposed leg and asked how these measurements would be made. Jarrard said that leased tools such as the JAPEX and SANDIA tools will be used; fluid sampling and temperature measurement will, in theory, use off-the-shelf tools but their performance in practice must be demonstrated before their use at sea.

NORTH PACIFIC TRANSECT

Lancelot noted 2 objectives: 1) Neogene history of surface and deep water resolution (OHP interest), and 2) Cretaceous superchron plate geometry and plate boundary evolution (TECP interest). The first is the primary objective, and emphasizes the high-latitude record. Drilling is planned for 2 settings on highs, the Detroit and Patton-Murray seamounts. Other sites are located in deep basins, where they would take advantage of ridge-flank deposition at a time when they were above the CCD. Seismic data are poor and inadequate for ties to cores. The deep basin sites will probably not reveal much Cretaceous sediment. Siliceous sediment should be abundant, but is not the target of this program. Lancelot strongly encouraged acquisition of new and better seismic data, even if this occurred after drilling, though it would be preferable to acquire them before. Lancelot was not convinced that 1 or 2 holes could define superchron geometry. He felt that the paleolatitude of Detroit Seamount and confirmation of the motion of the Hawaiian Hotspot did not add strength to the existing proposal.

Discussion

Natland said that he had looked at DSDP Leg 86 results before Leg 132 and had a number of concerns. He felt that the Neogene objectives would be compromised by a lack of biostratigraphic resolution in the upper section. In addition, the top of Detroit Seamount has been scoured by currents and sediment there was probably redeposited. Based on experience at Suiko Seamount, paleomagnetic measurements on many flow units from the basement of Detroit Seamount would be required in order to determine a statistically valid paleolatitude but this is not proposed. Finally, concerning Mesozoic biostratigraphy, there is only 1 reference site (Site 183) with only about 4 cm of Maastrichtian nannofossil chalk at the bottom of that hole. Cita-Seroni said that she was surprised that OHP had given this proposal its highest priority. All of the deep sites are in water depths of about 5 km, the seismic data are old and poor and the sediments thin. Shackleton said that the purpose of the deep sites is a low-frequency record of siliceous sediment, the polar front and wind transport. A piston core from the top of Detroit Seamount contains a record of the last 100,000 years. Leinen agreed with Shackleton and Moberly noted that the existing seismic data were accepted by CEPAC. Mutter said that not only is the quality of the old (1965 *Vema*) data poor, but the lines are not located accurately and, consequently, neither are the drilling sites. Francis asked how deep the holes to be drilled to bit destruction would be and asked how sure the proponents are limestone lies below the transparent sediments at these deep-water sites. Lancelot said that the theme is important, but that the program is not focussed and the choice of sites is not well documented. However, so little is known of high latitudes in the Pacific that it is worth trying to resolve part of the puzzle. Shackleton, commenting on the suggested Cretaceous weakness, said that the prime objective is Neogene and that tectonic objectives were inserted by CEPAC.

CHILE TRIPLE JUNCTION

Austin said that the purpose of the program is to study subduction of an active ridge crest. The proposal has been around for a long time and he admired the tenacity of the proponents. A great deal of data, of many different kinds, is available. It is configured as a 2 leg program. TECP has ranked Chile Triple Junction I (CTJ I), which focuses on the collision area for the most part, as their first choice. CTJ II, focussing on pre-and post-collision events, is their second choice.

Pre-collision drilling will study forearc and possible backstop. There is a BSR and the fluids emphasis of the proposal has increased over time, but it remains primarily a structure and tectonics program. The collision study involves east-west and north-south transects, with fluid monitoring where the ridge axis is subducted. Ophiolite emplacement is also to be studied. It is not clear whether the gas responsible for the BSR is thermogenic or biogenic. Post-collision drilling will study the recovery of the forearc. The study of fluids is secondary in the CTJ proposal, in general.

Discussion

In response to a question from Tucholke, Austin said that the basic foci of the proposal are the nature of the forearc destructive process, monitored by uplift and subsidence. Mutter expressed doubts as to how drilling would address ophiolite emplacement. Moores said that perhaps it was impossible to address collision problems with drilling, but that this is a world-class problem. The rationale for 2 legs was logistical. Regarding ophiolites, Moores said that he had some concerns about whether one hole would solve the problem. The subduction zone developed from preexisting fault zones at the subduction complex. Natland asked whether any of the problems can be addressed well by trying to address all. Von Rad said that both SGPP and TECP are excited by this proposal, but SGPP thought that only 1 hole need be drilled in each of the pre- and post-collision areas rather than transects. SGPP suggested 1 leg of CTJ and a second leg that is half CTJ and half PGH. Suess added that SGPP's interests are focussed on the collision zone and on fluids, although the proposal is not strong on the latter. Taira said that TECP felt that this was a vertical tectonics program addressing morphological changes and metamorphic effects of ridge subduction. CTJ II covers primarily vertical tectonics, and this would be lost if only one leg was scheduled. Malpas said that CTJ is the closest to a purely tectonic program before ODP. It is a world class area; the ophiolite study is just an add-on. Cowan characterized CTJ as exploratory and a chance to address hypotheses. Austin said that the proponents are extremely enthusiastic and asked whether reconnaissance still plays a part in ODP. Humphris said that LITHP sees collision as an important problem, but had difficulty in understanding how the proposed drilling will solve the problem.

Mutter said that renewal must be considered: ODP cannot promote serendipity as the rationale for its programs. Moberly, however, said that selling ODP would be assisted by increasing the interest of other groups of scientists and Jenkyns agreed. Responding to Shackleton, Austin said that the South American margin has been accretionary for 150 m.y., but where is all the sediment? That is the reason that proposal spends much time on the nature of erosion (episodic, etc.). The type of rock found impacts on that process. Tucholke said that balanced cross-sections would be very helpful and Moores replied that he was sure that the proponents are working on that. Natland said that he was intrigued by the collision zone, but that CTJ has to be thought of as an exploratory program.

EAST PACIFIC RISE

Malpas said that the EPR-DPG was formed to reconcile existing 12°50'N and 9°30'N proposals. (Objectives of EPR drilling are listed in Appendix 19, together with a summary. The total program involves an array of 6 holes both along and transverse to the ridge axis.)

Malpas said that PCOM had heard that reaming has not yet been addressed, but it is needed. ODP is already committed to an EPR engineering leg as a test of the DCS. The first EPR science leg may have to be delayed to await development of DCS III, which will lag the first EPR engineering leg by at least 1 year. The other option would be to drill slowly with DCS II to relatively shallow depths. Scheduling of the EPR engineering leg depends on the success of Hole 504B clearance (Leg 137). If Hole 504B is not cleared, transit to EPR-1 would take 13.5 days. Malpas asked if these days could be used more effectively and questioned whether they should be taken off the Leg 137 engineering leg, since as much time as possible is required for testing DCS (Appendix 19).

Discussion

Duncan pointed out that the ODP-TAMU engineers will require at least 1 extra engineering leg to test DCS III when it is introduced. Francis said that the transit from Victoria would be 11.5 days. The engineers will require at least 33 days on site during the first engineering leg. Moores recommended that the proponents factor in tectonics.

CASCADIA

Cowan compared the objectives of the Cascadia DPG (CA-DPG) program with those of the Oregon Margin (OM) proposal (Appendix 20). The DPG program is strongly fluids-oriented, and includes 3 sites in the Vancouver Island (VI) area. (Measurements required at the OM sites are listed in Appendix 20.)

Cowan went on to discuss some issues and risks. 1) Technological capabilities at the time of the leg: it may be possible to squeeze fluid from cores if instruments like Geoprops are not available. 2) Local variability of focussed venting (OM) is an issue, adding uncertainty to quantitative estimates of flux. 3) Hole conditions: the area is known to be locally cemented (carbonates and crusts). Cementation of the upper layers may preclude use of the WSTP and LAST. Unstable conditions due to swelling clays or breakouts are also possible. 4) DPG recommendations should be reconciled with those arising from the SGPP/TECP reviews. 5) Whether drilling would represent progress beyond accretionary wedge drilling to date. The proposals were initially tectonic, but are now focussed on fluid flux. If fluid flux goals can be achieved, this region, especially OM, is an excellent place for such a study. Cowan felt that the program will not yield a quantum leap relative to existing knowledge if fluid flux objectives cannot be reached because of tool development problems. He suggested that it be evaluated as a fluids leg.

Discussion

Taira said that TECP had prioritized OM more highly than VI. Von Rad said that SGPP discussed this program intensely and that its compromise (Agenda book white pages, p. 195-196) did not differ greatly from the DPG report (Agenda Book white pages, p. 225). Malpas said that that changes to the original proposals were great: the DPG created a fluids program, as did SGPP, while TECP preferred a tectonics program. The original proposals had a tectonics focus; the fluids component was added and the tectonics component was now minimal. This should be clarified to the proponents. Moberly said that the DPGs report to PCOM. Austin added that PCOM nominates a DPG to evaluate proposals that are competing, or that cover some common ground. Cathles suggested that the definition of tectonics may be part of the problem; the fluids are moving because of tectonics. Malpas, however, argued that OM addressed faulting, etc., as did the original VI proposal. This component was not part of the DPG's proposed VI drilling. Moores said that TECP felt that the data from OM was better than that from VI. Von Rad noted that TECP's interest had been in deep penetration of the prism and the panel lost interest when this component was deleted.

HESS DEEP

Duncan reported that the objective of drilling at Hess Deep (HD) is to obtain a complete section of oceanic crust by offset drilling. Sites are located at a deep area at the tip of a westward-propagating rift tip west of the Galapagos. Targets are: 1) layer 2-3 transition, 2) upper and lower plutonic sequences, and 3) the Moho. Supporting data include submersible dives and Seabeam coverage. Rocks are fresh and the rift valley is bounded by stepped faults with relief varying between 5400 and 2200 mbsl. A number of 1 -1.5 km deep holes are planned and drilling is estimated to require 4 legs. The order of priority of the sites is HD-2, 1, 3, 4, followed by 5 and 6. SSP would like greater seismic coverage and a sidescan survey to identify talus and intact surfaces. LITHP wants to start drilling without these additional data and the proponents argue that photographs from submersibles reduce the need for sidescan data. TECP would like more thought given to structural considerations. Duncan added that US and French groups should work together to describe HD sites in detail. The proposal includes no description of logging activities.

Discussion

Responding to questions from Malpas, Duncan said that it is not known with certainty whether the Moho is pristine or whether juxtaposition of lower crust and upper mantle rocks is structural. He added that the reason for drilling, in spite of the availability of dive samples, is to view oceanic lithosphere in more dimensions. Humphris said that the original work on HD was prompted by work on the propagating rift. Moores expressed concern that the expectations depend on interpretive cross-sections that are not balanced. Francis said that the 4 leg scenario is probably an underestimate of the time required, but Mutter noted that the first leg is the priority. Duncan added that Moho drilling would be the target at the first site, HD-2. Drilling would start in cumulate gabbro and penetration would be 1-1.5 km. Watkins commented that better seismics might improve chances of achieving the objective, and Kidd noted that one objective is to test the 2 structural models and yet seismic data are lacking. Mutter, however, said that testing structural models was not the primary purpose of the program. Humphris noted that there is a section in hand from Hole 735B at the other end of the fast-slow spreading spectrum. Duncan said that, for the Moho objective, the program is ready but needs work to address structural development.

881 PROGRAM PLAN FOR FY 92

Austin drew PCOM's attention to the Agenda Notes (p. 18-26), which contained information and considerations relevant to selection of the FY92 program plan. A total of 6 science programs, or 5 science programs and an engineering leg, should be selected. The selection must be based on the following. 1) Panel input: should the highest priorities of each thematic panel be drilled, or should PCOM focus on multidisciplinary programs at the expense of individual thematic panel priorities? 2) Previous commitments. 3) Excitement. (Austin noted EXCOM's recommendations in this regard.) 4) Technological concerns.

Moberly reviewed other considerations with respect to the proposed programs. He said that EXCOM is interested in generating excitement outside the drilling community. This suggests the following order: HD, in particular the mantle objective; AG, mid-Cretaceous drowning; SR II, drilling sulfides will involve a large community not presently interested in ODP, as will CTJ; BS, links ODP to NAD and GSGP initiatives; and 504B, with links to continental deep drilling. Safety and logging should also be considered. Moberly went on to suggest an "easy to hard" ranking: NPT, with weather the only constraint; HD, some structural uncertainty; AG, some difficulty with reef recovery; BS, weather problems; PGH, probably the easiest if there is a change in gas hydrate drilling policy; CTJ hole stability, concerns about present site selection; EPR, speed of drilling with DCS a problem; SR II, DCS safety concerns. Considerations related to future drilling might be: to leave the northern Pacific loop for another year, or to leave the southern loop. For example, CTJ might be picked up on the way to Antarctica or South Atlantic at some later stage. Finally, considerations of tenacity of proponents would yield the following ranking: AG, BS, CTJ, EPR, SR, CA. All have been around since COSOD-1.

Austin noted that the ship will arrive in Panama to conclude Leg 140 at the end of November 1991. This will be the beginning of northern hemisphere winter and southern hemisphere summer.

Malpas said that exciting science is a question of packaging, but the science must be done properly or it will backfire. Some proposals rely on technological developments and should be dropped from FY92 to avoid failures. Austin asked PCOM if some possibilities should be eliminated first. Watkins noted that some sites can be reached from the Atlantic at a future date because of their proximity to the Panama Canal. Leinen proposed a motion to this effect, noting that some legs involved prior commitments (see below for final motion). Becker asked why the proposed motion omitted an EPR science leg from the FY92 program. Malpas replied that even if DCS II did make hole on an EPR engineering leg early in FY92, it would be necessary to learn to ream the DCS hole before the end of FY92 if a science leg were scheduled. In addition, deep penetration (beyond 150 m) is precluded by temperature-related safety concerns. The best equipment, in this case DCS III, is required if ODP is to push exciting science. The alternative is a half-hearted attempt. However, EPR science objectives should be kept in mind to keep pressure on the engineers. Sites are close to the Panama Canal and can be rescheduled when equipment is ready. Responding to Humphris, Natland said that Harding of ODP-TAMU had indicated that if DCS II is used only for the engineering leg, no slingshot test would be performed and the money would be applied to DCS III. In response to a question from Duncan, Malpas said that the purpose of the engineering leg at EPR would be practice with DCS II. Science objectives would await DCS III. Duncan, however, felt that 150 m of bare rock drilling would still be an achievement. Mutter asked if DCS II would be needed for the deep site on Leg 139, but Davis answered that DCS is not required. Leinen said that her motion did not preclude making hole with DCS II. The test of DCS III will probably be at the EPR.

Lancelot said that all science is supposed to be exciting, but that HD and EPR will arouse most public interest. He disagreed with the philosophy of trying to attract outsiders to ODP, arguing that they would be involved as proponents if they wanted to be in ODP. He added that even if there is investment in DCS III, chances of success are slim. DCS II can make progress at EPR. Cita-Seroni, von Rad, Taira and Jenkyns expressed agreement with Leinen's motion. Austin noted the danger of taking pressure off the ODP-TAMU engineers to pursue developments and commented that Leinen's motion will add to the number of previous commitments. Francis said that the implication of the motion is that DCS II will be used for the EPR engineering leg and then ODP would switch to DCS III. He raised the possibility of the engineering leg achieving a penetration of 300 m and the temperature remaining low. Pyle said that the science plan must emphasize the content of Leinen's motion so that technology development can be taken into account in FY92 budget planning. PCOM finally passed the following motion.

PCOM Motion

With the present status of technology development, particularly DCS Phase II, it appears unlikely that an optimal science program can be undertaken both for Sedimented Ridges II and EPR Science I in FY 92. PCOM, therefore, moves that these programs be considered as a high priority for drilling at the earliest possible date commensurate with technology development and ship scheduling, assuming that the science remains a high priority of the relevant thematic panels(s). Since (at this time) the science at these areas is of extremely high priority in thematic panel and PCOM rankings, PCOM wishes to stress that technology development, particularly that of DCS Phase III, take place as expeditiously as possible.

Motion Leinen, second Malpas Vote: for 15; against 0; abstain 1; absent 0

Austin proceeded by summarizing top thematic panel priorities. LITHP: EPR science (no longer an option in FY92). TECP: 1 and 2 are CTJ I and II. SGPP: CA (modified) and CTJ (modified). OHP: NPT. He added that, in the past, PCOM has been more sympathetic to high priority panel choices than to multidisciplinary programs. In response to a comment from Becker, Austin said that all of these programs rank high globally. Moberly suggested that commitments to LITHP could be satisfied by scheduling 504B with HD as an alternative (with the same staffing) in the event that further drilling at 504B proves impossible, and also scheduling EPR engineering. Austin said that establishing an EPR site with DCS II is a commitment; he suggested scheduling a second EPR engineering leg for DCS III late in FY92 to keep pressure on the engineers. Mutter commented that scheduling HD late in FY92 would allow time for a seismic survey. Austin agreed and suggested that HD could, therefore, also be scheduled as an alternative to a second engineering leg. Leinen noted that AG is the highest-priority Mesozoic program of OHP, in any ocean, and Austin said that it had been a high priority at both COSOD meetings.

Malpas commented that if PGH and BS are dropped, only 4 legs are left: CTJ (1 leg), AG (1 leg), NPT and CA. Mutter stressed the need to know what can be done in 1 leg. He asked if a single CTJ leg would be a combination of the 2 proposed legs or the first leg of a 2 leg program. Austin said that the CTJ proponents would be satisfied with a single leg addressing collision objectives, primarily the first leg of the 2 leg program. The collision objectives are ambitious on their own. Moores added that the collision study would be condensed and, for example, 2 holes in the pre-collision area would be included. Von Rad pointed out that PCOM had previously stated that 1 or 2 legs would be required for CTJ. It should be done properly; he suggested 1.5 legs CTJ combined with 0.5 leg PGH. Francis had raised the issue of long transits and Duncan noted that they would reduce science. Becker suggested sandwiching CTJ between 504B/HD and EPR engineering. Responding to Moberly, Francis said that the ODP-TAMU engineers would prefer at least 2 other legs between DCS tests. Moberly said that if transits are long, CTJ and AG would be compressed from an original request of 2 legs each to 0.75 leg each. In answer to Lancelot, Francis said that EPR engineering requires 33 days, and some transit time could therefore be incorporated in the engineering leg. Austin commented that long transits would also damage possible add-ons.

Von Rad noted that the AG is being focussed into 1 leg. Lancelot added that he was tempted to rate 1 AG leg highly. Moberly said he would prefer to see elements of both AG proposals drilled. Austin commented that they have proved difficult to combine. Leinen raised the possibility of postponing CA until its chances of success are higher, because Geoprops and the wireline packer were not working. Jarrard said he was not sure that there would ever be a working wireline packer. Fluid samples can be obtained from the cores and the tools might not be critical. Cathles agreed and, in response to a question from Leinen, added that even in the absence of further technological advances, CA would still produce valuable results. Leinen feared that optimum science might be compromised for lack of tools, but Taira maintained that CA is a good program without the fluids component. Austin said that, if there were no further objections, he would favor scheduling 1 CA leg, without further commitment.

There was further discussion of modifications to the CA-DPG recommendations by SGPP and TECP. Cowan said that the VI component should be maintained. Malpas said that VI was originally a tectonic proposal, but that the DPG changed the emphasis to fluids. TECP responded that there was, as a result, insufficient tectonic emphasis. In response to Natland, Cathles said that no serious reservations were expressed by the proponents at the DPG meeting. Austin commented that, philosophically, PCOM should accept input from its DPGs. He further commented that Malpas had been voicing a proponent's objections to thematic panel modifications, not to the DPG report.

Austin asked why thematic panels had proposed modifications to CA. Cathles commented that VI did not fill an entire leg, and he thought that both OM and VI proponents felt stronger combined. Taira said that TECP did not like the half and half approach. Von Rad said that he did not like the philosophy that DPGs have the last word. Thematic panels have expertise. Moberly answered that DPGs report to PCOM and that thematic panels have an obligation to comment, but that PCOM makes the final decision, not the DPG. Moran reiterated the concern that CA relies on prototype tools except for the WSTP, which did not work on Leg 131. Austin reminded PCOM that if technology is not scheduled for use, it will be a guarantee no technological development. Cowan agreed that there is always a risk, adding that the tools will be developed on this leg. Mutter asked if CA was, therefore, an engineering leg. Taira said that ODP has to take a chance. Worthington asked about the timing relative to renewal, in case of failure. Malfait said that the key dates for renewal are late 1991 to early 1992, and that CA would be post-renewal.

Austin asked if PCOM could honor a commitment to the second CA leg recommended by the DPG. Watkins and Cathles said that if the leg is a success and exciting, or alternatively a failure or ambiguous, the question will be answered. Austin noted that this approach differed from that to SR, where PCOM committed to return. He asked about the modifications and Malpas moved that PCOM accept the DPG program. PCOM passed the following motion.

PCOM Motion

PCOM moves that, should a one-leg program of Cascadia margin drilling appear on the FY92 schedule, it should be that program submitted by the Cascadia margin Detailed Planning Group.

Motion Malpas, second Cowan Vote: for 13; against 2; abstain 1; absent 0

PCOM continued to discuss general aspects of the FY92 proposed program. Francis noted that ODP-TAMU had considered running the ship slowly to save fuel costs, trading science time for transit time. He also made the general point that a long engineering leg wastes the time of engineering personnel. NPT has a length problem at 69 days, he added. Tucholke suggested 2 legs of AG instead of NPT, but Shackleton said that would not be welcomed by OHP. Austin said that optimum leg length is reached with the minimum objectives from proposal 203/E(Rev). Tucholke asked if ODP should do a few things well or many things less well. Austin emphasized that the early part of the FY92 program must be exciting. Moberly said that PCOM must choose between North and South Pacific programs because of logistics. Austin said that CTJ was out on its own, but Watkins pointed to its high ranking. Malpas said that 504B cannot be delayed because of possible further deterioration of the hole. Von Rad said that CTJ is essential and that the decision must rather be between eastern and western Pacific programs. Jenkyns disagreed, characterizing AG as essential.

Austin questioned the technological capability to carry out AG successfully. Moberly, however, said that recovery is only a problem in very rubbly limestones. Cita-Seroni said that ESF supports the AG program; PCOM should not attempt to put all of the programs in FY92. Tucholke said that CTJ is TECP's first global choice, but that its second choice (i.e. conjugate passive margins) comes up soon in the Atlantic. CTJ is also easier to reach from the Atlantic than is the Western Pacific. Austin commented that he was getting the sense that weakness as a science program might be the main reason for dropping CTJ. Taira, however, suggested dropping NPT instead. Austin responded that NPT is OHP's priority and has links to Global Change. Lancelot commented that ODP has had problems at convergent margins, for example at Nankai. AG and NPT are globally-oriented and highly visible in comparison to CA and CTJ. Moberly suggested that the question was whether to spread or focus ODP's efforts, and having made that decision, how to spread or concentrate. Austin suggested a straw vote on the issue of spreading or concentrating the effort. **PCOM favored concentration on more science at fewer locations.**

Shackleton said that some low-priority NPT science would be lost because of long transits. Mutter said that PCOM might not be able to include priorities of all panels, noting that subduction complexes have been well-studied in the western Pacific. Austin commented that it was possible to incorporate the first priorities of all thematic panels, but Moberly reminded PCOM that was a majority of PCOM favored further concentration. Duncan asked if there was sufficient time available to address AG and CTJ objectives in a schedule that incorporates all thematic panel priorities. Austin said that only the collision objectives of CTJ could be met.

Malpas reminded PCOM that the plan to depart for the Atlantic in October, 1992 flexible. He suggested inserting a second AG leg and sliding the rest of the schedule back, utilizing the first leg of FY93, which would be HD or EPR engineering. If the science is there, ODP should have the option to stay. Moberly said that non-US representatives should be consulted about any delay in moving to the Atlantic. Cita-Seroni said that her mandate from ESF was to adhere to the fiscal year, except in the single case relating to requirements of AG. Jenkyns said that the

UK would have no objection. Austin commented that the philosophical intent to return to the Atlantic is the important point, rather than exact timing. Von Rad said that the FRG could wait another 2 months to move to the Atlantic. Lancelot said that the issue of timing was less important to France than the thematic issue of preferring to limit drilling of accretionary complexes. Austin added that most Atlantic programs could use extra planning time. Humphris asked if Malpas's proposed schedule would create problems with weather windows. Francis replied that it was near the edge but acceptable.

Austin said that he would still like to get PCOM's feeling for an overall schedule. Cowan said that he would like to hear from TECP whether CTJ can accomplish sufficient science in the time available. Moores said that it could because of the uniqueness of the tectonic setting. Suess noted that, in any case, SGPP's support had been only for the collision zone objectives.

Malpas presented a motion that the *JOIDES Resolution* depart the Pacific in approximately January 1993. This meant that the first priorities of all panels could be addressed in addition to a comprehensive AG program. Austin called for discussion. Tucholke asked if there was time to do both AG and CTJ well. Austin said that 38 days of drilling would be available, compared to a requirement of 41.5 days to achieve highest-priority proposed collision objectives of CTJ. In response to von Rad, Austin said that the BSR element was included. Malpas said that if PCOM decided which programs should get 0, 1 or 2 legs, he would include that in his motion, or alternatively withdraw it. In a series of straw votes, the opinion of PCOM was that AG should be a 2 leg program, with the remainder being 1 leg programs. Suess said that AG was initially ranked by SGPP as a 2 leg program. The expectation during the new rankings was that only 1 leg would be available. Shackleton said that OHP saw 203/E(Rev) as requiring more than 1 leg, but did not discuss the merits of 1 leg versus 2. He felt that if 2 legs were scheduled, they should comprise a generic program, taking in some of both proposals. Cowan pointed out that the proposed schedule gave CA a lot of time at the expense of NPT. Austin agreed that NPT should get more time, but that such imbalance might be unavoidable. Malpas altered the motion to include the proposed schedule.

Austin asked if PCOM was delaying, for the time being, which AG proposals to include. Tucholke pointed out that 202/E(Rev) required 58 operational days. Moberly said that the second AG leg should end closer to the start of NPT than Honolulu. Leinen suggested that the extra leg should go to the more highly-rated 203/E(Rev), but others disagreed. Tucholke said that it would be better to combine AG proposals rather than give them separate legs. Austin reiterated that this has been historically difficult and raised the question of a DPG. Leinen suggested leaving it to OHP, perhaps with some extra help. Tucholke, however, pointed out that many themes are involved. PCOM passed the following motion.

PCOM Motion

PCOM moves that the *JOIDES Resolution* be scheduled to depart the Pacific Ocean approximately in mid-January 1993, thus allowing for 8 legs of drilling after the September 1990 port call at the conclusion of Leg 139. Thus the program is:

Leg 140	**504B or Hess Deep**
Leg 141	**Chile Triple Junction**
Leg 142	**Engineering 4, EPR**
Leg 143	**Atolls and Guyots**
Leg 144	**Atolls and Guyots**

Leg 145	**North Pacific Transect**
Leg 146	**Cascadia Accretion**
Leg 147	**Hess Deep or EPR**

Motion Malpas, second Leinen Vote: for 15; against 0; abstain 1; absent 0

Austin concluded that a DPG would be needed for AG, and reminded PCOM that it would have to add to its agenda empowering this group and getting recommendations for members. A representative will also be required from each thematic panel. Francis produced a tentative list of ports for the proposed schedule. Shackleton asked that PCOM not forget that NPT was ranked above AG by OHP and requested that NPT be given as much time as possible. However, Austin reminded PCOM that 56 day legs are the basis of planning.

882 LEG 137 - POSSIBLE ALTERNATE USES OF THE DRILLSHIP IF CLEANING OPERATIONS AT HOLE 504B ARE UNSUCCESSFUL

Austin began by pointing out that part of OHP's response had been left out of the Agenda Notes (p. 33). OHP recommended either starting Leg 138 or carrying out APC coring in the 504B area (covered by proposal 373/E). Becker commented that, since Leg 137 starts in March 1991, the prospectus must be written immediately. Urgently required, therefore, is clarification of: 1) contingencies, 2) time to devote to pre-cleanout fluid sampling and logging, and 3) how to schedule certain logging operations.

Becker said that the following contingencies, which singly or in combination can occupy 0 to 18 days, have been considered. 1) "Full" logging. A fairly full logging program has already been carried out and further logging can only occupy up to 5 more days. 2) Hydrogeochemistry near Hole 504B (proposal 123/E). WSTP will not be on the ship. Fluid samples can be obtained by squeezing cores, but temperature measurements can not be made. ODP-TAMU should leave a functional temperature tool on the ship. 3) Double APC coring at Site 505, 80 km north of Site 504B (proposal 373/E). Sediment thickness is only 225 m, so this option would occupy less than 5 days. 4) New hole at Site 504. Insufficient time is available. 5) Set a hard rock guidebase at Hess Deep. Again, insufficient time is available. 6) Start Leg 138.

Discussion

Moberly said that HD sites require better placement before setting a guidebase. Jarrard asked if the new APC heatflow tool, instead of the WSTP, would solve the problem. Becker replied, however, that the APC would only penetrate the upper 100 m or so of the 275m section. The hydrogeochemical objective is a local heat flow peak to the south of Hole 504B.

In response to a question from von Rad, Natland said that the sedimentary section at Site 505 is thick because of redeposition from surrounding highs. It has been cored (not with the APC) with good recovery. Becker said that his preference would be for contingencies 1, 2 and 3 in that order, but if the casing at Hole 504B is found to be bad early in the program, these options might not fill the time available. In answer to a question from Cowan, Becker said that the hydrogeochemical study would involve drilling holes at heat flow highs and address the uniformity of pore fluids.

Austin asked PCOM to consider the possibility of abandoning the option of starting Leg 138 in order to reduce the number of options. Moberly said that there is usually little enthusiasm or expertise among a scientific party for starting the next leg. Responding to Austin, however, Francis said that Leg 138 has a full program with tight time constraints. Leinen noted that proposal 373/E was reviewed, but was never ranked highly enough to drill. PCOM should consider only highly-approved programs. Austin said that SGPP and LITHP are both in favor of the hydrogeochemical study. SGPP is also in favor of double APC coring to basement near Hole 504B. Von Rad asked where the hole would be located. Austin replied that SGPP did not name a site.

Tucholke suggested starting Leg 138, since the ranking of the hydrogeochemical study was low. Jenkyns asked if the hydrogeochemistry ranking would rise if one site were extracted for drilling, making it , in effect, an "add-on". Leinen, however, said that the ranking would go down since the proposal (123/E) intended the study of a range of regimes. Duncan pointed out that 2 thematic panels chose this proposal. Austin commented that Leg 138 Site EEQ 2, which is outside Ecuadorian waters, would occupy 7+ days. He suggested dismissing the hydrogeochemical study since its level of priority is questionable. Tucholke also suggested dropping work at Site 505 if it is an area of redeposition. Moberly commented that starting Leg 138 has the virtue of flexibility. There was general agreement. Becker noted that full logging is still the first choice of the panels, and Austin said that this should be incorporated in the motion to be written by Tucholke. Natland observed that if Leg 138 is begun, the Leg 137 scientific party will be able to perform some studies that the Leg 138 party might not, for example pore-water sampling, temperature measurements, logging and basement coring. Becker said that the Leg 137 party will include a pore water chemist but no sedimentologists. He suggested another option: setting a re-entry cone for an OSN hole, if this is one of the projected OSN sites. Austin disagreed, adding that such action would have to wait until FDSN had better defined its objectives. In the event that there is insufficient time to start Leg 138, Becker suggested that hydrogeochemistry work near Hole 504B be carried out and Duncan agreed that this point should be addressed. Natland added that, if there is not enough time to make useful progress at EEQ 2, the next item on the list should be addressed. Tucholke agreed to modify the motion to this effect.

Becker said that he would like the temperature probe to be left on the ship for Leg 137 and that he still required some guidance as to how much time to spend on fluid sampling before beginning the clean-out of Hole 504B. He noted that the LANL sampler and flow meter permeability tools were scheduled for use on Leg 139 and there will be no WSTP on Leg 137. Austin said that the minutes would show that PCOM will rely on the experience of the chief scientist in this matter. Becker asked whether logging runs should be firmly scheduled in the event that Hole 504B is successfully cleaned, or left for the science leg. He singled out the FMS, which he said he would like to see run, adding that DMP also recommends it. Leinen suggested that this is micromanagement, but Austin confirmed that the ODP-TAMU engineers must get the time that they need at 504B. PCOM passed the following motion.

PCOM Motion

In the event that time is left following the attempt to clear and drill Hole 504B, these contingencies will be followed: 1) full logging program, 2) begin Leg 138 drilling. If the remaining time is too limited to begin reasonably Leg 138 drilling, then HPC/APC coring for hydrogeochemistry should be conducted in high-heat flow areas near 504B.

Motion Tucholke, second Leinen Vote: for 15; against 0; abstain 0; absent 1

883 MEMBERSHIP ON JOIDES PANELS

PCOM reviewed membership on the various JOIDES panels, and took the following actions. CVs of most newly nominated panel members are available at the JOIDES Office.

LITHP

Batiza, Cathles, Perfit and Mevel are rotating off the panel. Humphris asked that Perfit be retained until after the spring 1991 meeting. LITHP nominated J. Bender to replace Batiza and R. Zierenberg to replace Cathles. Both are willing to serve. LITHP has not been notified of the French substitute for Mevel. Jenkyns noted a correction to the membership list: the UK member is P. Kempton (BGS) and not P. Browning.

TECP

TECP requests that Dalziel, Engebretson and Buck, who are rotating off the panel, be replaced by S. Cande, C. Keen and M. Zoback, respectively. All have agreed to serve. Crawford said that Etheridge would be replaced by P. Symonds (BMR). Jenkyns pointed out that Westbrook is the alternate to Robertson and not a member.

In view of the large numbers of petrologically-driven proposals received by TECP, and the loss of expertise in this area with Buck's rotation, PCOM nominated J. Karson (Duke) instead of Keen.

SGPP

MacKenzie will replace Suess as chairperson after the Spring 1991 meeting. Frölich and Goldhaber are rotating off the panel. SGPP nominees for their replacements were G. Klinkhammer (OSU), K. Kvenvolden (USGS) and F. Sayles (WHOI).

PCOM felt that carbonate expertise is required by SGPP, especially with two legs of AG drilling scheduled, and nominated P. Swart (Miami). As PCOM was reluctant to having more than one member from the same institution, PCOM's nominees are Sayles and Swart.

OHP

OHP requested that Kent and Berger remain on the panel, at least until after the next meeting. OHP wishes to retain their expertise following a previous large membership turnover. If Kent is replaced, OHP requests a magnetostratigrapher. OHP had not approached any nominees, but suggested J. Channell (Florida) and J. Zachos (Michigan) as their choices to replace Kent and Berger, respectively.

PCOM felt that Kent and Berger should be replaced immediately. PCOM felt that T. Herbert's (SIO) area of expertise made him more suitable than Zachos as a replacement for Berger.

DMP

No membership action required. Austin reported that Worthington had suggested that Becker replace Langseth as PCOM liaison. Leinen said that the SMP liaison to DMP, Gieskes, had only attended 1 meeting and that liaison between the 2 panels is particularly important since they have just jointly endorsed core-log integration. Austin noted that SMP and DMP plan 1 joint meeting/year and that he would bring this point to Worthington's attention.

IHP

Austin reported that Moore, the IHP chairperson, wishes to leave after the fall meeting. Crawford said that N. Rock (University of Western Australia) will replace Lee. Moberly said that Co-chiefs would rotate through this panel more frequently than other members, as their purpose was to keep IHP aware of vagaries in post-cruise publication procedures.

PPSP

PCOM unanimously endorsed PPSP's proposal that L. Garrison join the panel.

SMP

Leinen noted that lack of a sedimentologist on SMP will hinder development of core-log integration. There is no member from FRG on SMP, and Austin informed von Rad that he should take action to find a FRG sedimentologist.

SSP

The industry representative, Hedberg, has resigned. USSAC nominates J. Farre (EXXON) as a replacement. Austin pointed out that Hedberg had been unable to attend meetings. He urged all panel chairpersons to notify PCOM of members who do not attend. Von Rad said that the FRG nominee would have to be changed.

TEDCOM

Austin reported that TEDCOM would like PCOM endorsement to find a person with high-temperature drilling expertise, which would involve an extra panel member. Kappel noted that USSAC would have to pay. Duncan suggested seeking an Icelandic scientist because of their experience with high-temperature drilling. He said that perhaps ESF should nominate someone, and offered to find some names. Natland suggested J. Eichelberger (LANL), who has worked with the Mono Lake drilling group. Moberly noted that TEDCOM was initiated to involve industry people and cautioned against replacing industry people with non-industry people. Austin said that he would advance Eichelberger to Sparks, but that he agreed with Moberly. Jenkyns noted that Grassick had been replaced by A. Skinner (BGS) as UK representative.

884 OTHER PERSONNEL ACTIONS

CO-CHIEF SCIENTIST NOMINATIONS

PCOM recommended co-chief scientists for the following drilling legs. All recommendations are in alphabetical order and no order of priority is implied.

Leg 140, Deepening of Hole 504B or Hess Deep

504B: No nominations

Hess Deep:

US: H. Dick (WHOI), K. Gillis (WHOI), J. Karson (Duke)

Non-US: J. Auzende (F), J. Erzinger (FRG), J. Francheteau (F) J. Malpas (C-A), C. Mevel (F)

Leinen said that she would like to see PCOM reiterate its endorsement of proponents as co-chiefs. Francis pointed out that ODP-TAMU must respect MOUs and balance US and non-US involvement. He added that FRG has been under-represented to date.

Leg 141, Chile Triple Junction

US: S. Cande (LDGO), S. Lewis (USGS), S. Macko (INSTITUTION?), P. Shanks (USGS)

Non-US: J. Behrmann (FRG), K. Emeis (FRG), S. Scott (C-A), T. Urabe (J), G. Westbrook (UK)

Leinen suggested choosing a sample-oriented person and a geophysicist. Austin commented that one of the proponents should be rewarded for their work to get this proposal on the FY92 schedule.

Leg 142, Engineering 4/EPR

US: R. Batiza (UH), C. Langmuir (LDGO)

Non-US: J. Cann (UK), J. Francheteau (F), R. Hekinian (F), A. Saunders (UK)

Austin said that a science leg has not been scheduled, but that PCOM usually nominates a single co-chief for engineering legs.

Legs 143 and 144, Atolls and Guyots

PCOM decided to ask for additional panel input before the next PCOM meeting, April 1991. Moberly said that discussion should be delayed until after the AG-DPG, depending on when this meets. A provisional list was given to ODP-TAMU, but ODP-TAMU will not act until April.

Leg 145, North Pacific Transect

PCOM decided to defer discussion until its April 1991 meeting. The provisional list discussed at the Annual Meeting is not to be acted upon by ODP-TAMU until April.

Leg 146 Cascadia Accretion

US:	B. Carson (Lehigh), M. Goldhaber (Colorado Sch. Mines) V. Kulm (OSU) C. Moore (UCSC)
Non-US:	K. Emeis (FRG),R. Hyndman (C-A)

Austin summarized PCOM's discussion by noting PCOM would prefer a mix of old and new blood and that a proponent should be chosen, in addition to maintaining international balance.

Leg 147, Hess Deep or Engineering 5/EPR

(Note: If Hess Deep: See Leg 140)

(Note: If Engineering/EPR: See Leg 142)

PCOM LIAISONS

Becker will become DMP liaison and be TEDCOM alternate. Mutter will replace Becker as LITHP liaison, after LITHP's next meeting. Mutter will also replace Langseth on DMP, but Langseth will attend DMP's next meeting. Leinen becomes liaison to the North Atlantic Arctic Gateway DPG (NAAG-DPG). The updated list is as follows:

LITHP	J. Malpas, J. Mutter
TECP	A. Taira, B. Tucholke
SGPP	R. Moberly, U. Von Rad
OHP	R. Duncan, H. Jenkyns
DMP	K. Becker, D. Cowan
IHP	Y. Lancelot
PPSP	J. Austin
SMP	M. Cita-Seroni, M. Leinen
SSP	Y. Lancelot, J. Watkins
TEDCOM	J. Natland, K. Becker
NARM-DPG	B. Tucholke
NAAG-DPG	M. Leinen
AG-DPG	J. Watkins
SL-WG	J. Watkins

LIAISONS WITH OTHER GLOBAL GEOSCIENCE PROGRAMS

International Lithosphere Program (ILP) Coordinating Committee on Continental Drilling

Austin said that liaison would be from ODP rather than PCOM. Panel members would be preferable. Action was deferred until the April 1991 PCOM meeting.

Inter-RIDGE

The interim Inter-RIDGE Steering Group has nominated P.J. Fox (USA), M. Sinha (UK) and J. Francheteau (F) as initial liaisons with ODP. PCOM nominated J. Bender (LITHP), J. Franklin (LITHP) and M. Mottl (SMP) to represent ODP as liaisons with InterRIDGE. J. Bender will be co-chairperson of this group from the ODP side, and a co-chair from the Inter-RIDGE side must be nominated. Pyle said that a proper procedure would be to call to determine the interest of ODP members in serving on the liaison group, then write to the Inter-Ridge Steering Group with names. He added that travel to meetings should be avoided as much as possible, and that liaisons should keep in touch by phone, etc. Mutter said that Inter-RIDGE meets twice a year and Austin replied that one of the ODP representatives should be sent. Pyle, reiterated that a primary objective was to avoid formality. Moberly said that PCOM put forward a mandate which EXCOM approved, and that ODP nominees should have a good working knowledge of ODP drilling plans.

PCOM will invite co-chairs to the August PCOM meeting, where they will present a single report. Travel expenses will be covered by ODP.

DETAILED PLANNING GROUPS AND WORKING GROUPS

North Atlantic Rifted Margins DPG (NARM-DPG)

Austin informed PCOM that all on the list below have accepted their nominations. The DPG will meet in February or March for the first time.

G. Boillot (F)*
M Coffin (UTIG)
O. Eldholm (ESF)*
J. Hall (C-A)
K. Hinz (FRG)*
D. Hutchinson (USGS)
H. Larsen (ESF), chairperson
K. Miller (Rutgers)
A. Morton (UK)*
D. Sawyer (Rice)
S. Srivastava (C-A)*
R. Whitmarsh (UK)*

* Proponents

Additional petrological expertise was suggested by the chair, Larsen. His nominee is J. Hertogen (ESF). Cita-Seroni said that ESF would like M. Comas, a Spanish structural geologist, to be added. Austin noted that Comas, a proponent, balances Hertogen, a non-proponent. PCOM has now sent Comas an invitation. PCOM felt that NARM-DPG would also benefit from the expertise of R. Buck (LDGO). He was nominated.

Austin said that DPGs normally meet only once, but that the NARM-DPG faces a complex task and may meet twice. Austin will contact thematic panel chairpersons to discuss liaisons when meeting dates/venues are set. He wished to avoid separate DPG and thematic panel rankings of proposals. Mutter questioned whether a WG would be more appropriate than a DPG, but Austin replied that it is a DPG because highly-ranked proposals exist and there is an urgent need to define a drilling program. Cita-Seroni agreed, adding that it is politically important to ESF. Austin noted, however, that the intent is not to exclude proposals. Mutter said that the NARM-DPG needs C. Keen, but Austin said that she is a proponent and that would upset proponent/non-proponent balance on the DPG. As a back-up in case of refusal by Buck, Austin suggested Sawyer (TECP).

North Atlantic Arctic Gateway DPG (NAAG-DPG)

All on the list below have accepted their nominations.

* Proponents

W. Berggren (WHOI)
R. Henrich (FRG)*
E. Jansen (ESF)*
L. Mayer (C-A)
P. Mudie (C-A)*
W. Ruddiman (LDGO), chairperson
T. Vorren (ESF)

Austin reported that the NAAG-DPG will probably meet in February. Austin will contact thematic panel chairpersons to determine whether they will nominate liaisons when meeting dates/venues are set.

Sea Level WG (SL-WG)

All on the list below have accepted their nominations.

M-P. Aubrey (WHOI)
R. Carter (C-A)
N. Christie-Blick (LDGO)
P. Crevello (Marathon), chairperson
P. Davies (C-A)
A. Droxler (Rice)
G. Eberli (ESF)
R. Halley (USGS)
T. Loutit (EXXON)

K. Miller (Rutgers)
W. Sager (TAMU)
M. Sarnthein (FRG)
A. Watts (UK)
E. Winterer (SIO)

Cita-Seroni said that J. van Hinte would be attending SL-WG for ESF. Austin reported that OHP had suggested adding R. Flood to this WG. He said that SL-WG would probably meet at Marathon Oil Co., Denver, in March 1991. Jenkyns noted that some of the names on the list would also appear on the AG-WG. He suggested creating a sub-group of the SL-WG to act as the AG-DPG and Leinen suggested adding a day, and some extra people, to the SL-WG meeting for consideration of AG. Austin, however, said that a separate group was needed even if the same people are involved. Austin will contact thematic panel chairpersons to discuss liaisons when meeting dates/venue are set.

Atolls and Guyots DPG (AG-DPG)

Following inclusion of two legs for AG in the FY92 Drilling Program, PCOM felt the need to establish an AG-DPG. After some discussion, PCOM nominated three proponents and three non-proponents (including the chairperson) to form the core group:

R. Halley (USGS)
F. Duennebier (UH)*
M. McNutt (MIT)*
D. Rea (Michigan), chairperson
H. Staudigel (SIO)
E. Winterer (SIO)*

* Proponents

Non-US partners add members as they please. Moberly presented a motion for establishment of the DPG. Von Rad said that the number of drilling days should not be included in the motion. Austin commented that the mandate to create a 2 leg program from 2 proposals is more precise than for previous DPGs, but PCOM felt that the final drilling program should include elements of both AG proposals. Francis stressed the importance of keeping AG legs to approximately 56 days. Leinen and Tucholke added that the DPG should take into account priorities of thematic panels and that panel minutes should be provided to the DPG. Austin replied that he would ask panel chairpersons to provide liaisons (non-proponents) who will supply panel interests or, alternatively, to provide a written input. Francis said the DPG should also understand there will be no DCS for AG drilling. PCOM passed the following motion.

PCOM Motion

PCOM establishes an Atolls and Guyots Detailed Planning Group (AG-DPG) to be charged to construct a two-leg drilling plan that includes the priority 1 and 2 targets of proposal 203/E(Rev) (approximately 38.4 days) and additional targets of proposals 203/E(Rev) and 202/E(Rev), selected so as to create a maximized, balanced scientific return from the range of objectives of these proposals. The DPG will also take into account thematic panel priorities.

Motion Moberly, second Tucholke Vote: for 14; against 0; abstain 0; absent 2

Moberly noted that each proposal contains a number of scientific objectives, and the staffing of the AG-DPG should take into account the proponents as well as the range of objectives. He added that two legs means two legs of 56 days each, including transit time. Furthermore, the recommendations and co-chief nominations of the AG-DPG, and comments on the recommendations of the thematic panels will be presented to PCOM before its August 1991 meeting.Moberly noted that Lancelot had left the name of a French nominee. Austin said that non-US participants are free to attend as full members, but that they must provide their own funding. He added that he would provide PCOM members with the time and place of the DPG meeting. He expects the DPG to meet for 1 day only. Watkins was pencilled in as PCOM liaison.

PCOM passed the following motion.

PCOM Motion

PCOM moves that nominees for panels, WGs and DPGs, selected by PCOM, be approached to serve.

Motion Moberly, second Duncan Vote: for 14; against 0; abstain 0; absent 2

885 FUTURE MEETINGS

Austin summarized the future PCOM meeting schedule. The 1991 Spring PCOM meeting will be hosted by Leinen at the University of Rhode Island, Graduate School of Oceanography from 23-25 April 1991. No field trip is scheduled at present.

The 1991 Summer PCOM meeting will be hosted by von Rad at the Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover FRG, from 20-22 August 1991. A two-day field trip to the Harz Mountains will be held following the meeting.

The 1991 PCOM Annual Meeting will be hosted by Austin and the JOIDES Office at the University of Texas at Austin, Institute for Geophysics (Thompson Conference Center) from 4-7 December 1991. The meeting will be preceded by the Panel Chairperson's meeting on 3 December 1991. A field trip may be held prior to the meeting.

The 1992 Spring PCOM meeting will be hosted by Duncan at Oregon State University, College of Oceanography from 21-23 April 1992. A field trip will be held.

The 1992 Summer PCOM meeting will be hosted by Malpas in Victoria, British Columbia, Canada.

The 1992 PCOM Annual Meeting will be hosted by Mutter at Columbia University, Lamont-Doherty Geological Observatory.

886 OTHER BUSINESS

OFFSET DRILLING WG

Austin reported that LITHP and TECP have requested a WG on offset drilling and have provided a list of nominees. He asked PCOM whether the WG should be approved, or whether the responsibility should be left with thematic panels as previously discussed by PCOM (April 1990).

Moberly suggested inviting guests with appropriate expertise to the normal panel meetings. Austin replied that the panels preferred that a separate body be organized. Duncan said that TECP would like a greater tectonic component in offset drilling and he thought that a WG would be the best way to ensure this. Austin noted that he was reluctant to have 3 DPGs and 2 WGs operating during any one period, but Natland said that a WG is needed, and it would be wrong to delay its formation because of timing. Duncan pointed out that, since PCOM's April meeting, HD is now on the schedule, potentially as a multi-leg program. Nonetheless, Austin said that he was reluctant to authorize a WG until LITHP and TECP have had another joint meeting. He said that he would discuss with the panel chairpersons the possibility of adding some discussion of this matter to that meeting, perhaps in the context of an extra day, possibly with extra personnel. Natland highlighted the risk of a number of Atlantic offset drilling proposals not being subjected to a proper evaluation. Austin was against going ahead with a WG immediately while so many other meetings are scheduled.

ADD-ON/PIGGY-BACK SCIENCE

Austin introduced the subject, which involved setting aside a number of days from the drilling schedule for "add-on" science. Mutter said that Becker had left a note to the effect that he was against "add-on" science, characterizing it as a misnomer since it subtracts from scheduled legs. If "add-on" science is to be endorsed, Becker was of the opinion that it should have the same thematic thrust as the original leg. Austin noted that PANCHM had made the same suggestion. Von Rad pointed out that regional availability of the ship would be the most important factor, but Austin said that PANCHM felt that there would be problems of staffing and expertise if there were no thematic link between the "add-on" and the original leg. Austin added that it was true that "add-ons" are really subtractions. Moberly said that "add-ons" should be put off until FY92 so that they can be factored into the schedule but Austin said that one impetus for "add-ons" was to increase excitement during renewal. Watkins said that "add-ons" should be considered on a case-by-case basis. Pyle noted that if ODP rejects "add-ons" it would be showing itself to be inflexible, as charged by EXCOM.

Austin continued by saying that PANCHM felt that if the possibility of "add-ons" was advertised, it would generate too many proposals. PANCHM suggested that there be a finite time window for "add-on" proposal submission, perhaps from January (when the ship track is published) until spring panel meetings. Austin added that PPSP is adamant that there be normal safety review of these proposals. Natland said that it should be stated that "add-on" proposals will be considered conditional to their impact on original legs. Austin noted that there are currently 2 "add-on" proposals in the system, for drilling in the Santa Barbara Basin and on the Navy Fan. Leinen commented that it is important that PANCHM are excited by the idea of "add-ons". Austin noted that PANCHM were less positive when they realized that "add-ons" involve subtraction from the original leg. Pyle asked whether SEDCO's wishes regarding leg length should control ODP. Francis replied that the contract refers to legs of approximately 8 weeks in length; there will be problems if leg lengths are increased. He added that no legs are less than 56 days; that length has become the minimum. Austin advised PCOM that if ODP advertises a policy of "add-ons", some will have to be incorporated. Mutter said "add-ons" for drilling sediments would take away time from LITHP/TECP objectives, but Austin pointed out that the "add-ons" need not involve a new hole but, instead, allow deepening to basement or additional logging. Austin continued that one goal of "add-ons" is to show the outside world that there is another way to do ocean drilling besides the 56 day leg; this should expand the community involved in ODP. Mutter reiterated that he thought it important to "add-on" to legs and not subtract. Austin replied that co-chiefs design legs to fill time available; if they have 54 days, they will use 54 days instead of 56. He added that he believed that ODP needs to try "add-ons" but that he was reluctant to make it a permanent policy. Austin said that PCOM should not decide on a specific "add-on" before the policy has been advertised so that all can respond. Watkins suggested a straw vote on the policy. That vote determined that a majority of PCOM were in favor of allowing "add-ons". Moberly put a motion before PCOM. Tucholke commented that the motion implied that time will be made available and that some "add-ons" must be included. Mutter again expressed the concern that this will take time away from legs and create dissention among co-chiefs, but Austin said that co-chiefs have always had to prioritize sites. PCOM passed the following motion.

PCOM Motion

PCOM moves that JOIDES allow and advertise the possibility of including short, one to four days proposals along the general ship track. Proposals will be reviewed by the thematic panels, SSP and PPSP for PCOM's decision.

Motion Moberly, second Leinen Vote: for 10; against 3; abstain 1; absent 2

Discussion

Austin turned the discussion to the total number of days of "add-on" science to be allowed. Leinen suggested no more than 12 days. Francis added that this should be on the understanding that average lengths of legs will not be changed. Moberly suggested 10 days. Leinen said that the long transits in the FY92 schedule would allow the number of days to be varied. Austin noted that it will be imperative for ODP to provide some days for "add-ons" during the first year for which the policy is advertised. He asked PCOM to consider the question of thematic consonance with original legs and the issue of the timing of the "add-on", noting that an "add-on" cannot be announced too close to the date of departure of its parent leg without creating staffing problems. Austin added that it was his understanding that the policy will begin with FY92 and Leg 141. Tucholke put forward a motion to devote 10 days to "add-ons", so that ODP would be forced to provide this time. Leinen pointed out, however, that so far there are insufficient programs supported by thematic panels to ensure that the 10 days could be used. The motion was defeated. Vote: for 2; against 12; abstain 0; absent 2.

Austin said that the window for submission of proposals must be limited to avoid a potential. Leinen suggested endorsing the PANCHM window of opportunity. Austin stated that the window in question is from January until spring, for the panels to provide recommendations for a PCOM decision in August. Moberly noted that the window really begins after the PCOM Annual Meeting, since word of the ship track was public from that time forward, and Austin agreed.

PCOM Consensus

PCOM generally endorses the PANCHM recommendations (Appendix 8) for the submission and review of "add-on" proposals.

PCOM also passed the following motion.

PCOM Motion

PCOM will consider scheduling up to 10 days of *ad hoc* drilling during legs 141 to 147.
Motion Cowan, second Leinen) Vote: for 12; against 0; abstain 2; absent 0

Austin concluded by saying that the minutes will reflect that PCOM understands the SEDCO working relationship with ODP-TAMU regarding leg length.

DISCONTINUING BLIND WHOLE-ROUND SAMPLING/FREEZING FOR ORGANIC GEOCHEMISTRY

Natland moved that PCOM endorse OHP's plan (see Agenda Notes, p.34; white pages p. 205) for whole round samples. Leinen noted that SMP was also asked to consider this. They had asked about the number of requests for whole rounds and wanted the opinions of geochemists on continuing/discontinuing the policy. The majority of PCOM felt that the number of requests has been very small. Leinen said that the samples are apparently only refrigerated for 3 years and that they are, in any case, not geochemically useful. Austin said that PCOM then endorses the OHP recommendations and requests that the existing samples be returned to the repositories. PCOM passed the following motion.

PCOM Motion

PCOM endorses the recommendation of the Ocean History Panel that whole-round sampling for organic geochemistry (OG) be discontinued, and that frozen 30-cm whole-round core sections presently in the repositories stored as OG samples, be returned to the regular collection.
Motion Natland, second Moberly Vote: for 13; against 0; abstain 1; absent 2

LENGTH OF DRILLING LEGS

Austin reiterated that PCOM recognizes that the average length of drilling legs should be 56 days.

AUSTRALIAN RENEWAL BROCHURE

Crawford noted that copies of the Australian renewal brochure are available. The brochure is designed to accompany the LRP.

PRESENCE OF PROPONENTS ON PANELS

Mutter raised the issue of proponents on panels. Von Rad said that on SGPP, proponents are not allowed to vote for their own proposals. Mutter asked if Suess was in the room during recent SGPP rankings. Mutter noted that if the PCOM chairperson had been a proponent of a proposal under consideration for FY92, he would have been absent for the entire process of selecting the FY92 schedule. Austin said that perhaps PCOM needs one or more *pro-tem* chairs. Moberly commented that it was common in the past for the PCOM chairperson to be out of the room for a whole afternoon. Austin said that, when generating the FY93 prospectus, PCOM may need to invite representatives from other proponent groups in the prospectus to balance those on PCOM. Leinen said that that even when proponents are asked to respond to specific questions, it can turn into a discussion, and Mutter stated that either all proponents should be present or none. Pyle noted that proponents would have to attend all PCOM meetings, and Leinen added that it would be better to exclude all. Mutter commented that there is a perception that ODP is a closed program. Cowan said that PCOM must deal with the information to hand and suggested excluding all proponents. He noted that the NSF system is to exclude everyone connected with a proposal.

Watkins suggested that this issue be placed on the agenda for full discussion at the next PCOM meeting. Jenkyns added that the JOIDES Office could consider the matter in the interim. Austin said that he was afraid that situations might arise where there was insufficient critical mass in the room to consider proposals properly. However, Mutter replied that any such item must be tabled and passed to the next meeting. Leinen agreed.

Tucholke went on to say that PCOM has a policy that no proponents be present. Jenkyns requested that Tucholke's comments be conveyed to the panel chairs. Mutter noted that the policy is not being uniformly applied. Tucholke said that panel chairs should know in advance to replace people if there is the likelihood of insufficient critical mass. Alternates should be nominated.

FY93 PROGRAM PLAN

Austin suggested that the JOIDES Office assemble the FY93 prospectus during the summer of calendar 1991. PCOM agreed with this plan.

STRATCOM

Pyle asked Austin about the future of STRATCOM. Austin replied that his feeling was that STRATCOM had no mandate to meet further, at present. There was no further discussion.

PARTICIPATION OF STUDENTS AS LABORATORY TECHNICIANS

Leinen began by saying that SMP had suggested that graduate students be allowed to participate in ODP legs as lab technicians. ODP-TAMU had endorsed the proposal because there is a lack of adequate technical support aboard ship. PCOM should limit numbers participating in legs and avoid having students compete with established scientists for slots. SMP's suggestion is to replace 2 science slots with 2 student nominees, 1 US and 1 non-US. The students would be members of the technical staff. Francis said that he had thought that SMP wanted extra slots, but Leinen said that their plan will reduce the number of science slots.

Austin said that the ratio of technicians to scientists should be improved. Leinen commented that, at present, students participate as scientists. Pyle said that SMP's recommendation must be considered by JOI, Inc. since it affects MOUs. Austin said that he would like the non-US PCOM members to come to the April meeting with recommendations. He added that students may prefer to participate as scientists rather than technicians.

887 ADJOURNMENT

The meeting was adjourned at 1:30 PM.

APPENDICES ATTACHED TO THE 28 NOVEMBER - 1 DECEMBER 1990 PCOM MEETING

1. Science Operator report, supplemental information
2. Wireline Logging report, supplemental information
3. PPSP Annual Report
4. DMP Annual Report, summary
5. SMP Annual Report, summary
6. SSP Annual Report
7. IHP Annual Report
8. PANCHM minutes
9. STRATCOM reports, summary
10. TECP Annual Report, summary
11. SGPP Annual Report
12. OHP Annual Report, summary
13. EPR-DPG Report, summary
14. Cascadia DPG Report, summary
15. Science Operator, engineering and technical developments, supplemental information
16. Wireline Logging, engineering and technical developments, supplemental information
17. Atolls and Guyots PCOM Watchdog Report, supplemental information
18. Peru Gas Hydrates PCOM Watchdog Report, supplemental information
19. EPR PCOM Watchdog Report, summary
20. Cascadia PCOM Watchdog Report, summary
21. LITHP Annual Report

LIST OF HANDOUTS DISTRIBUTED AT THE 28 NOVEMBER - 1 DECEMBER PCOM MEETING

1. NSF Report
2. JOI, Inc. brochure on Nansen Arctic Drilling
3. Minutes of the SMP Meeting, 9-10 October 1990
4. Recommendations for an East Pacific Rise Drilling Program
5. List of legs and ports for the FY92 Program Plan

000068

JOIDES Lithosphere Panel FY'90 Annual Report

The JOIDES Lithosphere Panel (LITHP) has met twice in the last year: once in March in New Orleans, where a joint morning session was held with the Tectonics Panel (TECP), and more recently in October. Our activities are documented in detail in the minutes from those meetings.

A number of important steps have been taken in the last year to begin to address LITHP's long-term goals that were outlined in our 1988 Long-Range Planning Document. In order to address our overall thematic objective of understanding the structure and composition of the oceanic crust and upper mantle, the lithosphere community now recognizes that both a complete crustal section and a program of offset sections of the lower crust and upper mantle are necessary. In the last year, progress has been made in both areas:

1) **drilling a complete crustal section** - this continues to be a critical long-term goal of LITHP and, based on the recommendation that resulted from the joint LITHP-TECP meeting in March, PCOM has created the Deep Drilling Working Group to identify the technology needed and to examine the strategies required to achieve this objective.

2) **drilling offset sections** - in the shorter term, drilling offset partial sections of the lower layers of the oceanic crust affords a way of characterizing parts of the crust using more immediately available drilling capabilities. Much of the interest in this strategy was generated by the DOLCUM workshop held 18 months ago, and a number of proposals have been submitted in the last year to use offset drilling in a number of different tectonic settings.

   LITHP is now urgently recommending that PCOM establish a working group to prioritize the scientific objectives that can be realized by offset drilling, and to determine a drilling program to meet the goals that are set.

In the last year, we have seen an initial step taken towards our goal of establishing global seismic arrays with the scheduling of the pilot hole off Hawaii. LITHP is very much aware that the most effective way to continue installation of new observatories is as an integral part of the ODP Long Range Plan so that all drilling sites that are in appropriate locations to become part of the seismic array, be equipped with re-entry cones when initially drilled. This requires, in the short term, identification of appropriate locations and, in the long term, continued monitoring to ensure re-entry cone installation in all potential observatory sites.

Other important highlights of the year include the formation of two Detailed Planning Groups to formulate drilling programs for the East Pacific Rise (this is already completed) and for North Atlantic Rifted Margins. In addition, LITHP is encouraged with the progress being made in locating or developing high temperature and slimhole logging tools, and wishes to stress that the success of LITHP's drilling programs next year depends on at least the basic suite of tools previously defined being available.

A major activity at both meetings has been ranking proposals, first in order to provide input to determine the track of the vessel through 1994 and, more recently, to prioritize the proposals in the Pacific Prospectus. In this report, I will present only the latter. Only six of the nine programs in the Pacific Prospectus were included in our rankings, and these fell into two clearly separated groups. The top three - EPR Bare Rock Drilling, Hess Deep, amd Sedimented Ridges II - received notably higher ratings (in fact, all but one of the 1st, 2nd, and 3rd place votes). Each of the top three addresses high priority LITHP objectives and hence are all critical to achieving our goals. EPR drilling has been a long-standing very high priority of the Panel in its efforts to obtain crustal sections of new oceanic crust. Sedimented Ridges II addresses fundamental hydrogeological and geochemical problems in hydrothermal systems and is essential to the overall Sedimented Ridges program that has been formulated. Hess Deep, by comparison, is a relatively new proposal, but provides an exciting opportunity to investigate the lower crust and upper mantle at a fast-spreading ridge. LITHP feels that we need to demonstrate success in addressing lithospheric problems and these three programs are critical in that effort.

LITHOSPHERE PANEL FY'90 REPORT

I Progress towards Thematic Objectives

1. Structure of crust + upper mantle

a) complete crustal section

(i) Deep Drilling Working Group

(ii) EPR Detailed Planning Group

b) drilling offset sections

(i) generation of proposals

RECOMMENDATION

PCOM establish an Offset Drilling Working Group

2. Global seismic arrays

a) scheduling of Oahu pilot hole

RECOMMENDATION

Observatory installation needs to be part of overall Long Range Plan

Requires : • site location (short-term)

• monitoring of re-entry cone installation (long-term)

II Other Highlights (from LITHP-TECP meeting)

1. Formation of N. Atlantic Rifted Margins DPG
2. Commitment to multi-disciplinary effort towards MOR processes.

21.4 000072

III Immediate Concerns

1. DCS SYSTEM

2. HIGH T AND SLIMHOLE LOGGING TOOLS

3. Engineering Leg to 504B

a) Viability of Hole 504 B

RECOMMENDATION

All equipment necessary to establish the future of 504B drilling should be carried on Leg 137.

b) Use of any available time

RECOMMENDATION

LITHP recommends the following use of additional time (in order):

1) full logging program (prior to recasing with liner)

2) investigation of hydrogeochemistry of sediments + upper basement near 504 (proposal exists)

IV Other Issues

1. ODP success in addressing Cosod I theme

– 3-page summary addressing 5 themes

2. Implementation of LRP

000073 21.5

V Ranking of Proposals
1) Spring - global rankings
2) Fall - Pacific rankings

5.3 Ranking of Pacific Proposals for the FY'92 Program

LITHP considered the nine programs described in the Pacific Prospectus for drilling in 1992. Six of the proposals were considered to be of LITHP interest and were included in the rankings. The other three--Bering Sea History, Gas Hydrate Formation, and North Pacific Transect--were omitted as not within the mandate of LITHP. The ranking is as follows:

nk	Program	1st Place	2nd Place	3rd Place	4th Place	5th Place	6th Place
1	EPR Bare Rock Drilling	8	4	-	-	-	-
2	Hess Deep	3	6	3	-	-	-
3	Sedimented Ridges II	1	2	8	-	1	-
4	Chile Triple Junction	-	-	1	5	3	3
5	Cascadia Margin	-	-	-	4	5	3
6	Atolls and Guyots	-	-	-	3	3	6

Budget Committee Report
14 and 15 March 1991
Washington, D.C.

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Ans'd............

1.1 The Budget Committee met in Washington, D.C. on 14 and 15 March 1991. Members present were James Briden as chair, Hans Dürbaum, Arthur Nowell, Ralph Moberly, and Garrett Brass (acting for James Austin). Present for part of the time were Philip Rabinowitz, Audrey Meyer, and Rick McPherson (TAMU), Roger Anderson and Xenia Golovchenko (LDGO), and Thomas Pyle and Ellen Kappel (JOI).

1.2 The National Science Foundation had provided a target figure for Fiscal Year 1992 of $41.4M from U.S. and partner-country funds.

2. FORWARD LOOK

2.1 The BCOM has an important task beyond the one of recommending to JOI, on behalf of the Executive and Planning Committees, an appropriate distribution of funds with which to carry out the Program Plan for the next fiscal year. As it has in recent years, BCOM identified efforts to advance drilling, core recovery, and logging that will be required in years beyond FY92, and attempted to identify special operating funds to accelerate those efforts. Within a total budget of $41.4M we could identify only $1.81M for these important expenditures (4.6% of our allocations to TAMU and LDGO). The JOIDES advisory structure, in particular TEDCOM, DMP, and PCOM, has indicated that the present rate of development will delay and perhaps preclude attacks on many important scientific problems.

2.2 After its evaluation of the program and the rate of technological developments, EXCOM in 1988 had projected that total costs for each fiscal year in the late 1980s and early 1990s should be about $1M more than the budgetary target figures given them by NSF. BCOM estimates that the minimum figures for fiscal years 1992, 1993, and 1994 are expected to be $42.5M, $44M, and $45M respectively, assuming low inflation. Additional funds should be dedicated to projects designed to improve the scientific return from operations planned for the early phases of the Long Range Plan. We ask JOI to pursue all these avenues with the National Science Foundation to secure these additional funds required for the successful pursuit of the highly ranked scientific objectives identified by JOIDES. (ACTION: JOI)

3. PROPOSALS TO BCOM

3.1 The draft budgets proposed to BCOM were:

TAMU	$36,010,100
LDGO	4,022,794
JOI/JOIDES	1,504,688
MRCs	70,000
Total	$41,607,582

3.2 Additionally, BCOM had to address an unfunded carryover of $307K from FY90 into FY91, principally attributable to LDGO.

3.3 Following preparatory Private Session, presentations were made by the prime contractor and the chief subcontractors on March 14. Particular attention was focused in the TAMU presentation on the Special Operating Expenses items with emphasis on technological development, particularly Phases II and III of the Diamond Coring System, and on completing the catch up of the publications. We noted that the second manuscript coordinator who was funded last year to assist in the catch up has been incorporated in the base budget. It is unclear whether this second person will be required once the catch up is complete in FY92. Included in the TAMU SOE request was support for expanding the Gulf Coast repository by completing the refrigeration. This item had been deferred from last year. The 4% increase in the SEDCO day rate reflects an anticipated PPI adjustment.

Concern about escalating fuel costs last fall resulted in a special allocation from NSF to meet anticipated costs in FY91. NSF has also indicated that it will consider requests for a special supplement directed only to increased fuel costs should such a circumstance occur in FY92. At the direction of NSF, the budget presented was based on a fuel price of $200 per metric ton.

3.4 The LDGO presentation focused on their request for a significant increase in base budget, the rationale for which was founded on a rise in demand for logging products, especially the increased work-load derived from the addition of FMS data. The wireline packer has been put on hold, and LDGO proposes to spend only $80,000 of the $180,000 in the FY91 SOE budget; they requested to carry forward the remainder for tool development in FY92.

Because of a very heavy work-load, LDGO has also proposed to drop the second year of membership ($9,000) in the Conoco Consortium for comparative assessment of logging tools. The LDGO request included the Schlumberger logging subcontract, which had a 6.4% increase.

3.5 The JOI/JOIDES presentation noted the uncertainty in the JOI overhead due to variation in the total volume of JOI business. The budget presented for FY92 for the JOIDES Office had unavoidably been prepared without the direct input of the head of the JOIDES Office.

3.6 There was no presentation on the MRC, which is in the second year of a two year project approved last year.

4. <u>RECOMMENDATIONS</u>

4.1 The Committee moved into executive session and focused its immediate attention on the importance of engineering development, not only within the SOE but also the core budgets. The Budget Committee considered the rate of technological progress in ODP under the target budget figures to be slower than is healthy for the program. Several million dollars per year more could be very well spent. As a consequence, BCOM recommends that priority technology enhancement initiatives should be identified amounting to $1.1M to be implemented if the target figure were raised from $41,400K to $42,500K (see paragraph 2.2). The opportunity to propose such enhancements should be extended to all parts of the ODP community and not restricted to the subcontractors. (ACTION: JOI)

The importance of significant timely progress on the Diamond Coring System was emphasized. The Committee felt that the status of each project in engineering development should be evaluated. Rather than the slower progress on many fronts that is presently being achieved, PCOM should evaluate each in terms of the advice of its panels and the schedules presented by TAMU and consider which should be terminated and which should be identified for rapid development. (ACTION: JOI to PCOM)

The Budget Committee therefore recommends the following allocations, with comments in paragraphs 4.2 - 4.6:

	BASE	SOE	TOTAL
TAMU	$34,254K	$1,551K	$35,805K
LDGO	3,810	140	3,950
JOI/JOIDES	1,450	—	1,450
MRC	70	—	70
Additional Technological Developments	—	125	125
Total	$39,584	$1,186	$41,400

000078

Standard Operating Expenses
(in $K)

		REQUESTED	PROPOSED
TAMU			
1.	Publications: additional volumes	$120	$70
2.	Repository refrigeration	91	91
3.	a) Recoating drill pipe	125	—
	b) Hess Deep or) c) DCS (additional to) 4 below))	350	350 see later
4.	II DCS	660	660
	III DCS	120	220
5.	Forklift	30	—
6.	Scientific Equipment	160	160
		$1,656	$1,551
7.	Science Operations	189	
8.	Drilling Operations	715	
LDGO			
1.	High-Temperature Tool	140	140
Additional Technological Developments		—	125
		$2,700	$1,816

Compare with target SOE based on 4% TAMU + LDGO: $1,590

4.2 TAMU. BCOM was pleased that once again the base-budget requests were very close to the target figures and responded effectively to the Science Plan. For TAMU, BCOM proposes that the base budget be set at $34,254K, that is $100K less than requested. Moreover, the recoating of the drillpipe and any addition to the special provision for publications (see items 1, 3a of SOE table and notes below) must be met as priority items within this base. Reductions in the base budget should not come from the high-priority categories of engineering and publications.

BCOM recommends top priority be maintained to completing the catching up on publications, to achieve removal of the backlog and steady-state publication ("Initial Reports"-12 months, "Scientific Results"-36 months after the end of the leg) by the end of FY92. It therefore accepts this SOE bid which should be the last that is required for this purpose. However, BCOM noted that "Initial Reports" for Leg 132, 136, 137, and "Scientific Results" for Leg 124E would be small, and therefore reduced the budget provision without lowering priority.

BCOM also endorsed top priority SOE for the core repository refrigeration, Hess Deep, Diamond Coring System and scientific equipment (items 2, 3b, 4 and 6 of SOE table) with some qualifications—see below.

- The core repository refrigeration clearly cannot be delayed again and must be implemented in FY92.
- BCOM approved the request for $350K for Hess Deep drilling but suggested that if Hess Deep is deferred, the funds to support it should be carried forward to the year in which it is actually drilled rather than being automatically transferred to the DCS Phase III project.
- On the Diamond Coring System, BCOM accepted the advice that Phase II of the DCS development and trials (operating from the derrick) is necessary and urgent, but also that transfer to the rig floor (Phase III) should be explored as rapidly as possible to minimize the time to eventual completion of this project. BCOM therefore approved these bids in full, and enhanced the provision for Phase III in the knowledge that TAMU's bid had been limited by their perception of money available.
- While BCOM agreed on the allocation of $160K SOE for scientific equipment, it was not fully satisfied with the prioritisation of items within this request and item 7 (Science Operations). BCOM recommends reconsideration by the Advisory Structure. In particular, it was suggested that TAMU staff convey cruise report and Co-Chiefs' Meeting recommendations to PCOM regarding priorities for shipboard scientific equipment (ACTION: JOI, PCOM, TAMU). Scanning and recoating of drillpipe is a sensible and economic step; it is regarded by BCOM as a proper component of ongoing re-stocking and refurbishment and therefore not eligible for SOE except possibly in a year when there is headroom in the budget for "buying ahead." It is an essential item which should be done within the base Base Budget in FY92.

4.3 LDGO-BRG. The Budget Committee was pleased with the accomplishments of the Borehole Research Group over the last year but expressed concern over the cost over-run. BCOM recommended that the cost overrun not be carried forward into FY92 but that $100K of unexpended FY91 SOE funds be reprogrammed to cover part of the overrun which was the result of genuinely special expenditure of high priority and mostly totally unavoidable. JOI and LDGO should find ways of meeting the remainder of the overspend in FY91. (ACTION: JOI, LDGO)

BCOM recognized the increase in demand on BRG's time and recommended granting most of LDGO's requested increase to their base budget. Within this, it recommends that three of the additional personnel requested should be added. The Committee expects that this increase in personnel should be sufficient, if used creatively, to cover the increase in BRG's task and did not approve a fourth position. The Committee also recommended that the increase for "other direct costs" should be moderated although after further consultation with LDGO, it recognised that savings may actually have to be achieved elsewhere instead, in consultation with JOI.

The Committee approved the $140K SOE request for high-temperature tools. Because of the necessity to eliminate the carried-over deficit in FY91, SOE monies will not be available for carrying forward to FY92 as LDGO had requested. But the opportunity to compete for further SOE monies is identified in 4.6 below.

4.4 JOI/JOIDES. The Committee approved the budget requests of JOI and JOIDES offices subject to reductions of $25K and $30K respectively. In the case of the JOI office, this reduction should be accomplished by a modest reduction in personnel assigned to the program. At the JOIDES office, the reduction reflects the BCOM's estimate of the potential savings based on the past record of the JOIDES Office budget.

4.5 MRC. BCOM recommended the second and final installment of funds for making radiolarian reference slides for use at the Micropaleontological Reference Centers.

4.6 Additional SOE. The result of BCOM's deliberations produced a budget allocation some $125K below the present target figure notified by NSF. It is recommended that JOI management allocate this for additional SOEs, which should be identified by the start of the fiscal year. These funds should not be used to restore base-budget cuts, and SOE requests not included in the original budget submission should not automatically be funded from this pool: it is specifically for innovative SOE expenditures to accelerate technological progress.

5. Aide Memoire for BCOM 1992

Next year the Budget Committee will be giving detailed consideration to the budget for the final year of this phase of the program. It may be that two budgets will need to be considered depending on the progress of renewal negotiations. In any case it will be most useful to have available at the meeting, detailed background information for each of the TAMU, LDGO, JOI, and JOIDES cost centers; much of this was available to the 1991 BCOM but was not used. We anticipate particular scrutiny to major equipment and salary provisions next year. More immediately, we request that the 1991 Performance Evaluation Committee (PEC 3) assess the present equipment situation of the subcontractors as this would inform BCOM in its task. (ACTION: JOI)

6. In addition to the actions identified earlier in this report, BCOM invites JOI to invite further discussions with the subcontractors and JOIDES Advisory Structure to develop the 1992 Program Plan and compatible budget. (ACTION: JOI)

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

Texas A & M University
College Station

RECEIVED
MAR 1 1 1991
Ans'd............

6-8 February 1991

EXECUTIVE SUMMARY

1. An important focus of this meeting was the question of borehole stability in tectonically active regions. Other important aspects were a briefing session with ODP/TAMU engineers, a review of the wireline packer and alternative technologies for downhole fluid sampling, joint discussions with ODP/TAMU systems engineers to review progress towards the shipboard integration of core and log data, development of the FY92 logging programme, and the status of high-temperature downhole-measurement technology.

2. Panel was informed by ODP/TAMU engineers of initial plans to progress the reaming option for drilling loggable holes at Diamond Coring System (DCS) sites. During Leg 142 it is planned to attempt a 7-inch hole using a diamond core barrel (DCB). This is the first step up the learning curve of reaming a 7-inch hole from a 4-hole. The Engineers report that if a 7-inch hole cannot be drilled with the DCB, reaming to this size will not be a viable option. However, reaming to smaller diameters might be achievable.

3. The Panel reaffirms its commitment to the scientific objective of obtaining uncontaminated fluid samples downhole. At present, ODP does not have a functional wireline sampler through which this objective can be achieved.

4. The two basic issues governing fluid sampling are the engineering of the tool and the scientific integrity of the sample. Both of these aspects should be examined by a specialist working group or workshop with a view to identifying the best available options for downhole fluid sampling in ODP-type situations. No new tool developments should take place until these issues have been resolved.

[DMP Recommendation 91/1 : to PCOM and JOI]

5. The Geoprops Probe should be subjected to further land tests after the remaining necessary modifications have been made. Subject to a satisfactory performance in those tests, the Geoprops Probe should be tested at sea by ODP at least two legs prior to its proposed scientific deployment, in order to allow adequate time for any residual modifications to be made.

[DMP Recommendation 91/2 : to Geoprops Proponent and ODP/TAMU]

6. The Panel congratulates the ODP/TAMU Technical Service Group on the excellent progress towards the shipboard computer-based integration of core and log data.

7. The growing demands on systems staff arising from shipboard computer-based data integration is making it necessary to have more computer technical support on board ship, at least for the time being. The level of this support should be sufficient to ensure that the data integration goals can be achieved.

[DMP Recommendation 91/3 : to ODP/TAMU]

8. A high-spectral resolution geochemical tool should be run in Hole 504B during Leg 140, in addition to the standard GLT. This will allow a comparison of sodium-iodide and high-resolution detectors as well as providing important new elemental flux data. The high-spectral-resolution tool should be subjected to land tests and full performance evaluation prior to deployment.

[DMP Recommendation 91/4 : to LDGO and Leg 140 Co-chiefs]

9. In addition to standard logs and targeted check-shot VSP, an enhanced-resolution geochemical log should be run in selected holes during Legs 143 and 144, provided that earlier deployments are considered successful. Such a tool could greatly enhance the geochemical characterisation of drillhole sites, especially with regard to trace elements.

[DMP Recommendation 91/5 : to LDGO, Atolls & Guyots DPG, and Legs 143 & 144 Co-chiefs]

10. In addition to standard logs, high-resolution magnetometer and susceptibility tools should be run in selected holes of the North Pacific Transect (Leg 145).

[DMP Recommendation 91/6 : to LDGO and Leg 145 Co-chiefs]

11. Since Re-entry Hole 801C is located just three days out of Guam, the port call between Legs 143 and 144, this hole should be re-entered and the previously aborted programme of downhole measurements carried out. This exercise should be regarded as an addendum to the FY92 ODP programme. This is an important issue because Hole 801C penetrates very old oceanic crust and there is no provision for ODP to drill crust of similar age in the future.

[DMP Recommendation 91/7 : to PCOM]

12. The following options should be considered to enhance the prospects of borehole logging in accretionary complexes.

    (i) Case off the upper portions of unstable holes either with a full re-entry system or using the drill-in-casing system (DIC) with or without a mini-cone.

    (ii) Drill offset dedicated holes for logging where cored holes become unstable; the dedicated holes can be drilled quickly to reduce exposure of the formation to seawater.

    (iii) Log deep holes in several stages: during XCB drilling, this should not require additional pipetrips; during RCB drilling, additional trips may be needed.

(iv) After drilling and coring, flush logging holes clean and then fill with heavy mud, probably weighted with barite, with a weight of at least 12 lbs/gallon. In many cases, mud density approaching the formation density (19-22 lbs/gallon) will be more appropriate. Facilities and time on the ship will need to be available for mixing and delivering such a heavy mud. Flushing holes clean before using heavy mud may require pumping large volumes of fluid, particularly in cases where hole erosion is severe. The presence of barite mud will probably preclude lithodensity and photo-electric measurements (and will thus also reduce the quality of geochemical log measurements), but should have little impact on sonic, neutron porosity, natural gamma, resistivity and FMS logs. Borehole fluid sampling, packer measurements and BHTV runs will be compromised through the use of heavy mud (requiring that these measurements be made before heavy mud is pumped or in separate holes), but temperature logs may be improved if borehole convection is reduced.

(v) The need for heavy mud for each proposed hole should be identified and discussed by the co-chiefs, logging scientists, LDGO BRG representative and operations superintendent during the precruise meeting.

(vi) As with drilling muds, add chemical inhibitors and viscosity enhancers to logging muds when necessary.

(vii) Recognise that the sidewall-entry-sub (SES) is not designed to allow logging in unstable holes; it is best used in good holes with minor bridging problems.

(viii) Deploy short logging strings where these are significantly easier to run than long strings.

(ix) The time needed to make special preparations for logging must be included in time estimates for all legs during which these preparations are expected to be necessary.

[DMP Recommendation 91/8 : to LDGO, ODP/TAMU and Co-chiefs]

13. Because expensive ship time has been wasted and tools have been lost while trying to log unstable holes, at least a major portion of a future engineering leg should be devoted to evaluating borehole stability strategies in an accretionary setting, in preparation for upcoming scientific programmes.

[DMP Recommendation 91/9 : to PCOM and ODP/TAMU]

14. For high-temperature downhole measurements, the aim is to seek redundancy in both temperature measurements and fluid sampling. It two tools perform well, they can both be admitted for ODP deployment. Opportunities for interprogramme collaboration should continue to be explored.

15. Panel supports the proposal for a bromide tracer experiment in Hole 504B during and after Leg 137 as an important contribution to understanding fluid exchange with the upper basement.

000084

16. The next meeting of the JOIDES Downhole Measurements Panel is scheduled to take place at the Lamont-Doherty Geological Observatory, Palisades, New York, during the period 4-6 June 1991. This meeting will include a joint session with the JOIDES Sedimentary and Geochemical Processes Panel and will encompass a tour of LDGO Borehole Research Group facilities.

PAUL F. WORTHINGTON
18 February 1991

MEETING OF JOIDES DOWNHOLE MEASUREMENTS PANEL

Texas A & M University
College Station

6-8 February 1991

MINUTES

Present

Chairman:	P F Worthington (UK)
Members:	B Carson (USA) J Gieskes (USA) D Karig (USA) P Lysne (USA) R Morin (USA) C Sondergeld (USA) R Wilkens (USA) H Crocker (Canada/Australia) J-P Foucher (France) H Villinger (FRG)
Liaisons:	K Becker (PCOM) A Fisher (ODP/TAMU) R Jarrard (LDGO) J McClain (LITHP) J Mienert (SGPP)
*Guests	R N Anderson (LDGO) ** L Bernstein (ODP/TAMU) * E Davis (Geological Survey of Canada) * J Firth (ODP/TAMU) G Foss (ODP/TAMU) ** J Foster (ODP/TAMU) T Francis (ODP/TAMU) R Grout (ODP/TAMU) B Harding (ODP/TAMU) D Huey (ODP/TAMU) * M Langseth (LDGO) * R Lawrence (ODP/TAMU) ** M Mefferd (ODP/TAMU) ** R Merrill (ODP/TAMY ** B Meyer (ODP/TAMU) * D Moos (Stanford Univ.) * R Pace (NL Baroid) *** E Payne (representing BP Exploration) T Pettigrew (ODP/TAMU)

*** A Pierce (representing BP Exploration)
E Scholz (LDGO)
M Storms (ODP/TAMU)
* M von Breymann (ODP/TAMU)

Apologies:

X Golovchenko (LDGO)
M Hutchinson (USA)
K Moran (SMP)
T Pyle (JOI)
O Stephansson (ESF)
M Williams (USA)
M Yamano (Japan)

* attendance for agenda item 15 only.
** attendance for agenda item 13 only.
*** attendance for agenda items 9-11 only.

1. **Welcome and Introductory Remarks**

The meeting was called to order at 0850 hours on Wednesday 6 February 1991. This was the first DMP meeting of the year. Carson and Villinger were attending for the last time as panel members. Becker was attending for the first time as PCOM Liaison. An important focus of the meeting was the question of borehole stability in tectonically active regions. Other important features of this meeting were a briefing session with ODP/TAMU engineers, a review of the wireline packer and alternative technologies for downhole fluid sampling, joint discussions with ODP/TAMU systems engineers to review progress towards the shipboard integration of core and log data, development of the FY92 logging programme, and the status of high-temperature downhole-measurement technology.

Review of Agenda and Revisions

Borehole Seals would be reported under Tool Monitor Reports as Agenda Item 7(vi). Gieskes had proposed an additional agenda item concerning a tracer experiment at Hole 504B (Item 20). Discussion of the FY92 Logging Programme (Agenda Item 14) would be preceded by a brief review for FY91. The meeting would run to 1830 hours on 7 February and conclude at 1330 hours on 8 February 1991. With these modifications the precirculated agenda was adopted as a working document for the meeting.

2. **Minutes of Previous DMP Meeting, Townsville, Queensland, 11-13 October 1990**

The minutes were adopted without modification.

Matters Arising

(i) Publication in the JOIDES Journal of approved guidelines for the deployment of third party tools.

The Chairman had been informed by the JOIDES office that these were to appear in the next issue of the JOIDES Journal.

(ii) Logging characteristics of gas hydrates.

The Chairman will not be making a presentation at this meeting. Instead it will be made to the SGPP working subgroup on gas hydrates at their meeting in early March.

[ACTION:WORTHINGTON]

3. **Chairman's Annual Report**

The Chairman reviewed the highlights of 1990 and the forward projections for 1991 as presented to the annual meeting of PCOM and Panel Chairs in Kailua-Kona, Hawaii, during the period 27-30 November 1990.

There had been three DMP meetings during 1990, in College Station (January), Seattle (June) and Townsville, Queensland (October). The last meeting encompassed a joint session with the Shipboard Measurements Panel (SMP); this joint meeting had been preceded by a facilitation Workshop in Miami (August).

Three meetings are planned for 1991, in College Station (February), Palisades, New York (June), and Victoria, BC (September). The Palisades meeting, to be held at the Lamont-Doherty Geological Observatory, is proposed to encompass a joint meeting with the Sedimentary and Geochemical Processes Panel (SGPP). The Victoria meeting is proposed as a joint meeting with SMP.

The highlights of 1990 had been:

- a greater use of log data by the ODP and general marine science communities;
- the proven contribution of the formation microscanner;
- the development of a strategy for the shipboard integration of core and log data;
- development and deployment of the strengthened side-entry-sub;
- renewal-targeted presentations by the Panel Chairman to the National Science Board (USA), NERC (UK), and Australian Government Ministers and Science Planners;
- publication in Japanese of the multi-authored paper "Scientific applications of downhole measurements in the ocean basins", originally published in "Basin Research".

The disappointments of 1990 had been:

- hole stability problems in Nankai-type situations;
- the performance of the wireline packer during deployment at sea;

- the erratic facilitation of panel initiatives, particularly with regard to the holding of the ad hoc workshop on core-log integration.

The DMP strategy for 1991 comprises several elements.

Wireline Packer: a detailed performance evaluation, a design post-mortem, and a review of alternative technologies.

High-temperature Logging: targeted on temperature, pressure, borehole fluid sampling and formation resistivity, for slimhole deployment; a wider range of measurements may be possible at conventional hole diameters; a back-to-back study of leasable tools; aim to keep options open at present.

Sediment Magnetometer: validate accuracy and precision, link to core, assess performance reliability, reversals, time logging (with Milankovitch).

Geoprops Probe: needs functioning Motor-driven Core Barrel : trials, performance evaluation, deployment at sea.

Shipboard Integration of Core and Log Data : strategy/schedule for implementation, working group to monitor progress, review with SMP in September 1991.

Third Party Tools : publish guidelines, monitor compliance, loss control.

Publications : invited paper by Panel Chairman in "Reviews of Geophysics" on the status of exploration well logging; ODP will be strongly promoted; publication date estimated as December 1991. Paper in Geotimes by LDGO highlighting the growth in usage of ODP logging data within the earth-science community; suggested for submittal in mid-1991.

Specific recommendations not covered by the above include the FMS to be adopted as a standard logging tool, and the need to deploy the Diamond Coring System (DCS) under the direction of an experienced diamond core driller.

Two causes for concern were emphasized.

(1) Hole stability in accretionary wedges. There is a need to identify problems and remedies. A working group meeting has been proposed for 6 February 1991, as part of this DMP meeting.

(2) During 1991 there may be a need to propose ad hoc meetings in order to progress (i) high-temperature logging and (ii) wireline packer and alternatives. It might be beneficial to delegate these to subgroups. The system should have the flexibility to allow this to happen where justified.

4. <u>PCOM Report</u>

Becker reported on the November 1990 meeting of PCOM (held with Panel Chairs present) with particular regard to the PCOM response to DMP Recommendations 90/16-90/25.

Rec. No.	Description	PCOM Response
90/16	Shipboard test of LAST II	Not discussed
90/17	Contractor's evaluation of wireline packer	Not discussed: already done by LDGO
90/18	Post-cruise processing of BHTV	Not discussed: to be pursued by LDGO
90/19	High-temperature logging	Covered during JOI report to PCOM: progressing
90/20	DCS drilling	Flagged as important by PCOM: identified for later discussion but not revisited: ODP/TAMU aware
90/21	Cement-bond log in Oahu test hole	For Co-Chiefs' attention
90/22	Run FMS in 504B during Leg 137	Not accepted per se: if 504B is saved, run FMS during Leg 140: if 504B not cleared, FMS is highest priority log for Leg 137 (see below)
90/23	FMS to be a standard logging tool	Accepted
90/24	Working group on borehole stability in accretionary wedges	Accepted
90/25	Joint DMP/SMP specification of user needs for shipboard core-log data integration	Accepted with proviso that DMP and SMP maintain close liaison during the implementation phase

There was some discussion of DMP Recommendation 90/21. Foss pointed out that the long spaced sonic (LSS) is scheduled for the Oahu test hole; yet, the fulfilment of the recommendation requires the borehole-compensated sonic (BHC). The logging contractor undertook to investigate this matter, noting that the BHC is, in any event, present on the ship all the time as a redundant tool.

[ACTION:LDGO LIAISON]

Becker reported that a primary thrust of the November 1990 PCOM meeting had been to decide the drilling programme for FY92. The outcome resulted in a two-month extension of the Pacific phase of drilling with the following leg structure.

Leg	140	504B or Hess Deep	Leg	144	Atolls and Guyots II
	141	Chile Triple Junction		145	North Pacific Transect
	142	EPR Engineering Leg		146	Cascadia
	143	Atolls and Guyots I		147	Hess Deep or EPR

Science that depends on the Diamond Coring System (DCS) could not be accommodated, i.e. Sedimented Ridges II or EPR Science. Other candidates not scheduled were Peru Gas Hydrates and Bering Sea. If Leg 137 is successful in cleaning out Hole 504B, Leg 140 will be a science leg at this site.

PCOM approved the concept of add-on science for FY92. This should be in accord with the theme of the cruise. An advertisement has been placed in EOS to solicit proposals.

The Chairman reported on some discussion at the PCOM meeting concerning panel recommendations. Although panels exist to advise PCOM, and all their advice should be channelled through PCOM, it was recognised that many DMP recommendations are actually targeted at others, e.g. LDGO, ODP/TAMU and JOI. In many cases, DMP recommendations had actually been implemented before they were presented to PCOM. It was therefore deemed appropriate for the Panel to state at whom a recommendation is directed, so that action can be taken as soon as possible. In such cases it will be presumed that the recommendation is being made through PCOM. In general, PCOM would expect to discuss recommendations concerned with scientific planning matters but not those that address the details of technical support. The Chairman commented that as far as DMP is concerned, this represents a most appropriate shift of emphasis.

5. JOI Report

Pyle had conveyed his apologies for the meeting : therefore, no JOI report was received.

6. Liaison Reports

(i) Lithosphere Panel

McClain reported that ODP is now drilling holes very relevant to LITHP aims. In the short term, these include a full suite of logs in 504B, including FMS, packer, flowmeter, etc. In the longer term, targets are EPR bare rock sites, Hess Deep and Sedimented Ridges II. Deep crustal drilling is a long-term goal : LITHP has proposed an interim programme of drilling holes with 2-3 km penetration. Offset drilling is relevant to the Hess Deep : a proposal to set up a working group to report on this technique has seen a postponement by PCOM. High-temperature logging is the most important common interest between LITHP and DMP. The joint DMP-LITHP meeting in Windischeschenbach in October 1989 had been highly successful. Another joint meeting was desirable and at the earliest possible date. However, logistic considerations suggest the first part of 1992 as the earliest feasible opportunity.

(ii) Sedimentary and Geochemical Processes Panel

Mienert reported that SGPP had ranked Cascadia, Chile Triple Junction and Peru Margin Gas Hydrates as their three highest priorities for FY92. The last of these has not been scheduled; the other two are programmed.

The main SGPP problems are borehole stability and the drilling and logging of gas hydrates. A key question is the relationship of methane content to the bottom simulating reflector (BSR) : this question might be answered by comparing the characteristics of areas with and without the BSR.

The technology needed to address these goals comprises the sampling of liquid and gas, measurement of physical properties (Vp, ϕ, etc.), downhole temperature logs, and hole sealing.

In Cascadia it is proposed to use Geoprops, Pressure Core Barrel, borehole sealing, and a full suite of logs. We need to have a contingency if Nankai-type conditions preclude operations. SGPP needs to know which downhole tools have a high expectation of working at Cascadia.

In June, there will be a joint meeting of DMP and SGPP. Four possible agenda items were proposed.

(1) Probability of successful deployment of different downhole tools at Cascadia.

(2) Accuracy of geochemical logs.

(3) Logs in gas hydrates.

(4) How to make maximum use of sealed boreholes. How to keep samples at in-situ temperature and pressure.

The Chairman confirmed that he would be attending the next SGPP meeting at College Station in early March and would be making a presentation on the logging characteristics of gas hydrates.

(iii) <u>KTB</u>

Villinger reported that the main hole has reached a depth of 1143 m with 1500 m penetration estimated for the end of February. Current diameter is 17.5 inches. Drilling is comparatively slow because the Vertical Drilling System is being used and this requires great precision. The last logs were run at 763 m. These included a prototype of the Formation Micro Imager (FMI), a more sophisticated development of the FMS. It is proving difficult to correlate the pilot hole with the present hole, even though these are only 200 m apart.

KTB is looking at the question of high-temperature logging cable. Approaches have been made to JAPEX and to BICC (UK). The specifications include : 300°C; 150 MPa; 4000 m length; connects to standard cable; minimum 4 conductors but 7 conductors preferred. Key issues are the maximum delivery length, armouring, and the splicing technique. Lysne noted that there already exists 7-conductor teflon cable rated to 300°C.

There is to be a national KTB meeting in March. Lysne observed that an ODP-KTB workshop is needed to explore collaboration on high-temperature work. He noted that the US DoE and KTB are entering into some kind of mutually supportive agreement. There is also an NSF-KTB agreement to allow experiments in the KTB hole by US scientists. Panel noted that Villinger is to be replaced as FRG representative on DMP by Hans Draxler of KTB. It would be appropriate to explore collaborative possibilities at the next DMP meeting.

7. Tool Monitor Reports

(i) Geoprops Probe

Karig reported that a test had been carried out in a mock-up borehole at ODP/TAMU in December 1990. The hole was about 75 ft deep and used a full-scale BHA. The test was quite successful. The slug valve needs to be re-examined : there is believed to be a problem with sticky 'O' rings. There may also be a problem with packer inflation, since their maximum rated pressure might not be adequate to guarantee a perfect seal.

The Geoprops Probe needs a bench test to evaluate slug valve performance and then a further land test. Other technical needs are spare parts and a shipping container. Residual funds might cover some of these requirements but not all. At present there is no formal technical support for the tool, which is a third party tool. The system is nowhere near ready to go to sea. There is no plan for a second land test as yet.

The Geoprops Probe is needed for the Cascadia Leg. It should not be deployed at sea for the first time during Cascadia. Therefore an earlier target leg for initial shipboard deployment will need to be identified. Pettigrew, who had been involved in the Geoprops land test, confirmed that TAM had designed the tool well and that it works well considering this was a first attempt. It does, however, need more land testing. As regards shipboard testing, Pettigrew is tentatively scheduled to sail on Legs 136 and 139, and this might be relevant to future planning.

The Chairman commented that Geoprops should not be viewed in isolation. There are other impacting factors. The first of these is the Motor-driven Core Barrel (MDCB) without which Geoprops cannot be deployed. The second is the status of the Wireline Packer which also aims to sample fluids. The feasibility and relative importance of Geoprops can only be evaluated when the Panel has been informed of progress in these two areas, scheduled for reporting under Agenda Items 9 and 10, respectively, and when due consideration has been given to possible alternative technologies under Agenda Item 11. Further discussion of Geoprops was therefore deferred until later.

(ii) BGR Borehole Magnetometer

Villinger reported that work is continuing on the dewaring with Leg 140 as the ODP deployment target.

(iii) LAST

Moran had conveyed apologies for the meeting and no written report had been received.

(iv) Flowmeter Tool

Morin reported that the tool had been completed one month ago and satisfactorily bench tested. It had been shipped to LDGO for land testing in the LDGO test hole. Becker and Morin were to visit LDGO and would familiarise themselves with MASSCOMP. Subject to satisfactory land testing, the tool would be shipped to Hawaii to join Leg 137 for the return to Hole 504B.

The Chairman asked that special care be taken to comply with the guidelines for the deployment of third party tools. If we are to expect others to comply, it is important that we set an example ourselves.

(v) Japanese Downhole Magnetometer

Yamano tabled the following report *in absentia*.

Some of the specifications for the new Japanese downhole magnetometer have been changed. The tool would measure the three components of the geomagnetic field and the temperature inside the pressure case every one second. Magnetic susceptibility measurement will not be made because of technical difficulties in developing sensors. The two measurement ranges and resolutions are c.64000 nT and ± 2 nT or c.32000 nT and ±1 nT, and can be selected by a command from the ship through the cable.

The development schedule has also been changed. The tool will be completed by the end of August 1991, and tested in Japan during September. As a result, it cannot be proposed for use in Hole 504B on Leg 140. The first target will be Legs 143 and 144 (Atolls and Guyots). Although no magnetometer measurement is included in the FY92 downhole measurements prospectus, it is important to investigate the formation history of guyots and seamounts through logging the geomagnetic field. A proposal for using the Japanese downhole magnetometer on these legs will be presented in the detailed planning group meeting.

[N.B. DMP has not recommended downhole magnetometry during Legs 143 and 144 - see Item 14]

(vi) Borehole Seals

Instrumented borehole (re-entry cone) seals are being developed for initial deployment during Sedimented Ridges I (Leg 139) after testing operations during Leg 136. An NSF grant makes provision for six seals to be built in conjunction with Canada and the ODP. One has been built to date : it is to be shipped to Hawaii today (7 February 1991). This is not yet plumbed for sampling.

Becker is responsible for downhole instrumentation comprising thermistors on a downhole cable and a sampling tube. Davis is responsible for data loggers. Carson is responsible for the hydraulic coupling to a submersible (or ROV). A submersible can interrogate the data logger.

The deployment of the six seals is as follows:

Sedimented Ridges I (Leg 139 : July 1991) - 3 seals.
Cascadia (Leg 146 : September 1992) - 2 seals.
EPR - 1 seal.

It should be noted that the deployment of the seal requires a re-entry cone and a second casing string. This may impact on the time available for coring. However, SGPP view is that the fluid story is more important than core recovery at Sedimented Ridges I. A submersible is to be employed two weeks or so after Leg 139 to interrogate initially the three data loggers.

Becker reported that there has been a problem with costing. This is not a standard third-party tool and there is an ODP/TAMU budget element. The current ODP/TAMU budget does not encompass three seals for this fiscal year. Now that we have a more realistic estimate of costs, NSF should be re-approached for top-up funds.

8. Logging Contractor's Report

Anderson reported that the logging programme for Leg 134 had been carried out almost to the letter. This leg saw the first running of the German digital BHTV : no images are available yet in hard copy.

Leg 134 also saw the first ODP deployment of the French susceptibility and magnetometer tools. The magnetometer has a (high) resolution of ± 0.1 nT. Attempts are in progress to invert magnetic data in terms of time (reversals). The current view is that long wavelength diurnal variations do not require correction through surface magnetometry. However, these data do exist and they can be incorporated into the inversion process if necessary. The results will be reported at the next meeting. Schlumberger currently has three of these tools, one in the North Sea, one in Indonesia, and the slimhole version used on Leg 134.

The present leg is Leg 135. Here the FMS is being run in very shallow holes with a full logging suite in deeper holes. This indicates that the rule for logging holes deeper than 400 m, which was established to ensure that logs were run, might now be approaching redundancy. Unlike the early days, there is now a widespread appreciation of the importance of the logging product. The digital televiewer on board ship is no longer functioning : it has been broken during Leg 135.

Anderson commented on the need to extend the scope of geochemical logging. The present Schlumberger GLT has a low spectral resolution NaI detector. The Schlumberger prototype enhanced resolution tool (ERT), a cryogenic tool with a high spectral resolution and a claimed capability for diagnosing 28 elements, has now been abandoned. It is to be replaced by a new tool with a non-cryogenic composite crystal that is being developed by Schlumberger, but it will be some time before this becomes commercially available. The immediate prospect is an ARCO enhanced resolution tool which is potentially available to ODP. A possibility is that ODP might be able to run the ARCO tool with Schlumberger support. The prospects for enhanced-resolution geochemical logging (in ODP) therefore seem to be most favourable.

The Schlumberger MAXIS system, a super version of the present Cyber Service Unit (CSU), was scheduled to be installed onboard ship during the San Diego port call in July 1991. However, Schlumberger have requested a delay because of software difficulties. A possibility for installation is the second San Diego port call in November 1992. The CSU will be retained for a two-leg overlap with MAXIS to provide cover in the event of any teething problems.

Jarrard presented data that confirmed FMS repeatability. Two separate passes with the same pad orientation produced almost identical images. There is always a possibility that the pad orientations will not be the same on a repeat pass. In these cases, the cover of the borehole wall will be greater than with one logging run. The comment was made that shipboard data processing workloads might preclude repeat FMS runs on a routine basis. The Chairman suggested that Jarrard's repeatability demonstration ought to form the subject of an early publication.

Anderson reported that because of the large growth in requests for ODP data, the LDGO FY92 budget provides for four new technical posts. There are $140 000 allocated to high-temperature tool development in FY91 and a further $140 000 are earmarked for FY92. Schlumberger have announced increases in the engineer day rate (5%), the tool lease rate (4%), and the FMS day rate (60%). A decision is needed on whether to proceed with the Wireline Packer since this has implications for the budget.

NSF are funding Dave Goldberg of LDGO to convert the ARCO shear-source tool for ODP use.

9. **TAMU Engineering Briefing**

Storms reported on the status of the Diamond Coring System (DCS) Phase 2. This has a planned 4500 m total depth capability. Minor improvements are needed to the platform and the DCS itself, e.g. to the secondary heave compensator and the winch control. The re-entry funnel has been redesigned to expose more of the upward-facing surface of the guidebase. Various sea-floor spudding options are being evaluated for hard-rock sites.

A meeting between JOI, NSF and ODP/TAMU was held in December 1990. About $1.6 million is needed to complete the DCS Phase 2. This includes a feasibility study for DCS Phase 3. Indications are that the full sum will be forthcoming. The potential cost of the Phase 3 system is $3 million. This funding will not be made available in one fiscal year but perhaps over two years. Thus the DCS Phase 3 may not be ready before Leg 147 at EPR.

During Leg 142, also at EPR, it is planned to attempt a 7-inch hole using a diamond core barrel (DCB). This is the first step up the learning curve of our ability to ream a 7-inch hole from a 4-inch hole. If a 7-inch hole cannot be drilled with the DCB, reaming to this size will not be a viable option. If it can be drilled, a caliper log will be needed to investigate hole quality. A point to note is that even if the 7-inch hole is unsuccessful, other diameters (e.g. 5.125 inches) might be achievable.

Pettigrew reported on a new go-devil to be run with the straddle packer for flowmeter operation. The packer and the wireline have to be run concurrently. This requires that the drilling and wireline heave compensators be run at the same time. The go-devil pressures up and sets the packer. When depressured, the go-devil decouples from the wireline and is subsequently recovered.

The Pressure Core Sampler is on its way back from the ship. It needs re-fitting with high-temperature (125°C) seals. This is the prototype phase-1 tool : no action is being taken at present concerning a phase-2 tool.

Huey reported on the Vibra Percussive Core Barrel. This was deployed during Leg 133 after favourable land tests. However, the shipboard performance did not match the earlier tests on land.

The Motor-driven Core Barrel (MDCB), a new version of the Navidrill, was deployed during Leg 134 and is currently out on Leg 135. It has worked in 4 out of 5 runs. In the four "successful" runs, the best recovery was 1.85 m out of 3.5 m (instead of the target 4.5 m penetration). In essence, the MDCB is working erratically. This version was not land-tested prior to shipboard deployment because of scheduling pressures. Since the Geoprops Probe requires a functioning MDCB, the next test of MDCB could be dovetailed with a test of the Geoprops Probe.

The Sonic Core Monitor (SCM), intended to locate core pieces during partial recovery and to provide information on core orientation, was used during Leg 134. The SCM is a memory tool. Problems were encountered with the electronics, which are not sufficiently robust to withstand shocks and vibrations typical of an ODP drilling environment. Work is now underway towards the SCM Phase 2.

The new strengthened side-entry-sub is still not being used to its full potential. The aversion is believed to be due to a psychological problem stemming from earlier difficulties with stuck pipe.

10. Wireline Packer

Scholz presented a detailed status report on the Wireline Packer, which had failed to perform on Legs 131 and 133. This report is attached as Annexure I.

His primary recommendation was that the wireline-packer concept should be progressed, but not with the existing tool which is incapable of being modified to match scientific requirements. Instead work should progress on a phase-2 version of the tool which would resolve the problems caused by the original design, especially that of sample contamination. Estimated (median) costs are $250 000 for one Phase-2 tool and a further $100 000 or so for a second tool.

The Chairman thanked Scholz for providing one of the most comprehensive and forthright reports that the Panel had ever received. This would be invaluable when the Panel debates a recommended strategy for downhole sampling under Agenda Item 12.

11. Alternative Technologies for Downhole Sampling

(1) Simplified Wireline Sampling

Payne (representing BP Exploration) reported that an approach had been made to TAM some two years ago to develop a wireline sampler for leasing. TAM had responded to the effect that one was already under development. Presumably this was the ODP tool. The specifications were much less stringent than for the ODP tool, requiring an operating temperature of up to 85°F, a 1000 ft depth range, a one-foot straddle packer, and on-board measurements of conductivity and temperature. The tool was originally specified to contain sample bottles but this specification was simplified to pump directly to the surface those fluids which it was desired to recover. Outside diameter of the tool is 3.5 inches. A similar tool has reportedly been run in Nevada for environmental control.

(ii) OBCAT System

The Chairman reported on an Oceanic Borehole Chemical Analysis Tool (OBCAT), designed by the University of Newcastle-upon-Tyne, England, with support from the UK Science and Engineering Research Council. The aim is to obtain formation-water samples of verified integrity. The tool is designed as a go-devil interfaced to the TAM/ODP two-element drillstring packer. The tool can be used to set the packer. The principles of operation are to monitor the chemistry of waters pumped from a packed-off interval, to relay information to the surface along standard logging cable, and to take a sample when instructed. Dimensions are : diameter < 60 mm; length 8.5 m; sample chambers 6 x 200 ml.

The operational details are as follows. Pump water above the packed-off interval and thereby create a pressure differential across the go-devil so that water is drawn from the packed-off section. A slimline high-pressure pump extracts water from this flow. This water is pumped through a sample chamber into a multi-sensor head where eight chemical characteristics are measured. These are T, pH, conductivity, E_h, Cl^-, dissolved O_2, dissolved H_2, and S^{--}, with possibilities for alternatives to be substituted, e.g. Ca^{++}. A ninth sensor, outside the multi-sensor chamber, registers flow. The data are transmitted via a logging cable for surface display in real time. When data consistency is observed, the sample chamber is closed. Flow can then be directed through another chamber. The packer can subsequently be deflated and positioned at another location.

The tool has been field-tested in two test holes at BPB Industries, using 22000 ft of logging cable. The tool functions correctly but three problems have been exposed : the need for a non-corrodible solder on the pipework, the robustness of the electronics, and a requirement for spare parts. The current temperature rating is 90°C : there have been no hostile environment tests to date. It is estimated that it would require 6-9 months and £15 000 to rectify the shortcomings and complete the tool. At present, this work is not progressing but an appropriate Panel recommendation would act as a catalyst. It was noted that the present ODP drilling/fluid system might not allow a sufficient pressure drop to provide the necessary suction for successful operation.

(iii) Commercial Repeat Formation Testers

The Chairman reviewed the specifications of commercial formation testers.

Company	Tool	Temp (°F)	Tool Diam. (in.)	Minimum Hole Size (in.)	Maximum Hole Size (in.)
Atlas	FMT	350	5.13	5.88	9.88
			6.25	7.13	12.25
			7.88	8.75	16.00
			9.19	10.13	20.00
BPB*	SRFS	300	3.50	4.00	6.00
Schlumberger	RFT	350	5.20	6.50	15.50
	RFTTN-OH	400	3.38	4.75	6.75
	MDT	400	4.75	6.00	14.25
Halliburton	SFT	375	5.50	6.25	14.25
	SFTT-B	375	4.75	5.50	8.63
			6.50	7.38	19.00

* development phase

FMT	- formation multitester	SRFS	- slimhole repeat formation sampler
RFT	- repeat formation tester	SFT	- selective formation tester
RFTTN-OH	- ditto, slimhole, HE -	SFTT-B	- sequential formation tester tool
MDT	- modular formation dynamics tester		

These conventionally use a doughnut seal pressed against the borehole wall, rather than a packer, and therefore they are likely to be of little value in secondary aquifers. In no case can a commercial tool fit down the ODP drillpipe (4 inches) and expand to sample in a typical ODP hole (13 inches diameter). Schlumberger have no interest in developing a slimhole formation tester with this capability. This underscores the need for novel technology such as the Wireline Packer.

The Panel discussed a way in which commercial tools might be used in ODP holes. This would involve wireline re-entry while the ship is still on station. The drillstring could be removed and then a conventional formation tester run in conjunction with the side-entry-sub and with a TV camera for re-entry. This approach, which would require a dedicated trip, it is most likely to produce useful samples in compacted sediments.

(iv) WSTP

Fisher reported on the ($23 000) upgrade of the WSTP which had been requested for Sedimented Ridges I. Recorders and timers have been rated to 125°C. There are two thermistors, one with a range 0-60°C and the other 50-200°C. There is easier uphole downloading of data and sample for analysis. The tool tips, filters, fittings and tubing are made of titanium. The probes are longer, narrower and stronger. There are two disadvantages: (a) extra running time due to cleaning requirements; and (b) the possibility of the tool flooding if the probe tip is broken off, because of the absence of a high T,P small pass-through.

(v) Equilibration of Boreholes

With the emergence of borehole-sealing technology, an option is to allow boreholes to equilibrate after drilling and then to recover samples through an instrumented seal. These could be monitored with time to verify consistency. Such a system would overcome any potential contamination problems due to a downward flow of seawater within the borehole.

12. Strategy for Downhole Sampling

Anderson stated that if the Panel wished to progress the Wireline Packer along the lines proposed by LDGO (Item 10), a strong Panel endorsement of the LDGO proposal would be needed for implementation in FY92 and a ringing endorsement for implementation in FY91.

The Panel view was that the present Wireline Packer was an engineering failure. The Panel had previously expressed its grave reservations about how the project had been handled in the development stages. The project had also been disadvantaged by the environmental conditions imposed, i.e. the need for a slim and therefore a very long tool with storage and differential pressure implications, the need for a packer expansion by a factor of more than three, and the absence of fluid loss control during drilling. The outcome was that even if the tool had functioned perfectly, there is no guarantee that the recovered samples would be uncontaminated by drilling fluid. There was a high probability that a Wireline Packer Phase 2 would not produce the information required for scientific purposes. Therefore the Panel could not provide the endorsements indicated by Anderson as prerequisites for further development.

Mienert and McClain both reiterated strongly their panels' need for good samples of pore water. This is a major scientific requirement. Fluid composition allows the calculation of fluxes and provides important information on hydrothermal processes. Gieskes noted that we need to obtain formation waters from Layer 2: that is the whole philosophy of the Wireline Packer. Mienert stated that we need a tool that gives the correct chemical information but, if this is not possible, we need to know the inaccuracy. If the Wireline Packer is not available, SGPP want to know which tool(s) to use. Carson emphasized that the Wireline Packer, the commercial formation testers and the OBCAT tool all have the same disadvantage: it could take long periods to obtain samples of the required purity, notwithstanding that these might be irrecoverable. At the very least, the importance of the sampling issue suggests that we should consider it separately from the question of permeability.

In summing up, the Chairman recognised that the need for fluid samples had not gone away but that there was insufficient evidence that the Wireline Packer was a realistic way forward. The Panel proposed that the Wireline Packer be shelved, rather than abandoned, pending the input of further specialist advice. The following consensus was obtained.

DMP Consensus

The Panel reaffirms its commitment to the scientific objective of obtaining uncontaminated fluid samples downhole. At present, ODP does not have a functional wireline sampler through which this objective can be achieved.

The Chairman pointed out that if the Panel wished to recommend specialist input, this would have to be received outside the framework of Panel meetings, which were already full for 1991. Mienert observed that this input should be available for the joint DMP-SGPP meeting in June 1991: it would therefore have to be generated through a separate event. After much deliberation, the Panel formulated the following recommendation.

DMP Recommendation 91/1

"The two basic issues governing fluid sampling are the engineering of the tool and the scientific integrity of the sample. Both of these aspects should be examined by a specialist working group or workshop with a view to identifying the best available options for downhole fluid sampling in ODP-type situations. No new tool developments should take place until these issues have been resolved."

The rhetorical question was asked as to why the substance of the above recommendation had not been pursued at the outset. It might have saved the $250 000 already spent on the wireline packer.

The Chairman commented that DMP Recommendation 91/1 raises the importance of the Geoprops Probe which might well provide a short-term solution to the fluid-sampling problem. The first leg for which Geoprops is needed is Leg 141 and thereafter Legs 143 and 144. It is not required for Leg 139 because the in-situ temperatures are likely to be too high when indurated sediments are encountered. The tool is only rated to 100°C.

000100

DMP Recommendation 91/2

"The Geoprops Probe should be subjected to further land tests after the remaining necessary modifications have been made. Subject to a satisfactory performance in those tests, the Geoprops Probe should be tested at sea by ODP at least two legs prior to its proposed scientific deployment, in order to allow adequate time for any residual modifications to be made."

It was reiterated that these tests would have to be dovetailed with the deployment of the MDCB.

13. TAMU Computer Briefing

Meyer reported that the shipboard computer system is in the best shape ever (Annexure II). Previously exposed problems have been solved. In particular, the lack of disc space on the VAX has been rectified and the networking problems have been solved so that all systems (including LDGO) can exchange files. The VAX workstation for FMS processing has been tested and is operational. The number of PCs is increasing.

As regards shipboard data acquisition, the multi-sensor track (MST) has been upgraded from the standpoint of automatically recording GRAPE, magnetic susceptibility, and the P-wave logger. It is proposed to add the natural gamma. There is a question as to whether irradiation by GRAPE will have an adverse effect on the natural gamma data.

The shipboard integration of core and log data is being addressed in two stages, (i) through the integration of all core data, and (ii) through the integration of core and log data. Item (i) was addressed during Leg 134. The MST was used to provide a reference depth scale for all core data. It was overwhelming to the shipboard scientists to see all the core data together: they couldn't handle it. The earlier DMP/SMP recommendation of a dedicated correlation scientist is therefore essential. To achieve the integration of core data, the system manager had to postpone preventive maintenance. A second shipboard system manager will be needed, at least during the further development of the integrated system.

Mefferd reported on the shipboard processing of FMS data. The FMS was run in three holes during Leg 134. All data were processed. This usually took 3-5 days after receipt of the tapes, depending on the number of requests for plots at different scales. If two passes have been made with the FMS, the processing takes longer, partly because of the need to depth match. There is great interest in FMS data but shipboard scientists don't have the time to use them fully because of the basic chores that they have to do routinely. There is a human limit to what can be achieved. A possibility is to focus on intervals where core recovery is poor, in the first instance. This would provide the most important data at the earliest possible time.

Fisher commented that there are depth-match requirements associated with the FMS, with conventional logs and with core data. All of these are unconstrained. No one is unifying depth at the moment. There is no quality assurance. The designation of a correlation scientist is the only way one can count on this happening.

Bernstein demonstrated the computerised barrel sheet system. The aim is to capture the data electronically while the barrel sheets are being constructed. This system is being used on the current leg. The sheet has been changed to remove palaeo-data and to truncate some columns. This furnishes a narrower sheet with more space for inserting data for correlation.

DMP Consensus

The Panel congratulates the ODP/TAMU Technical Service Group on the excellent progress towards the shipboard computer-based integration of core and log data.

DMP Recommendation 91/3

"The growing demands on systems staff arising from shipboard computer-based data integration is making it necessary to have more computer technical support on board ship, at least for the time being. The level of this support should be sufficient to ensure that the data integration goals can be achieved."

14. FY91 and FY92 Logging Programmes

Jarrard and Fisher provided updates on the FY91 logging programme.

Leg 136 Oahu

The analogue BHTV will have to be run because the German digital tool is not functional at present. A question remains concerning BHC vs LSS tools for the cement-bond-mode sonic log (cf. Item 4).

Leg 137 Hole 504B

The Los Alamos National Laboratory (LANL) and the Lawrence Berkeley Laboratory (LBL) fluid samplers are to be tested on this leg. There have been earlier doubts concerning their performance but the tools will reportedly have been upgraded prior to this leg.

Leg 138 Eastern Equatorial Pacific

No change.

Leg 139 Sedimented Ridges I

The Geoprops Probe will not be run for scientific purposes (but cf. DMP Recommendation 91/2). Otherwise the logging plan is essentially as recommended by DMP.

The logging programme at the seven primary sites is as follows.

MV-6 (420-450 m sediments: < 50 m basement)

Standard suite	Temperature (High-T)
VSP	WSTP
Dual laterolog	APC-T
Fluid sampling	

MV-6 (120 m sediment: 0 basement)

WSTP	APC-T

MV-3 (470 m sediment: 50 m basement)

Standard suite	WSTP
Temperature (High-T)	APC-T

Re-entry Hole:

Standard suite	Temperature (High-T)
Dual laterolog	Packer/Flowmeter
BHTV	Borehole seal
Fluid sampling	

MV-1 (90 m sediment: 60 m basement)

WSTP	APC-T

Re-entry Hole:

Standard suite	Temperature (High-T)
Dual laterolog	Packer/Flowmeter
Fluid sampling	Borehole seal

MV-7 (250 m sediment: 50 m basement)

WSTP	APC-T

Re-entry Hole:

As for re-entry hole MV-3

The dual laterolog has been included because the formation resistivity might be too high for the induction. The proposal to run the Geochemical Logging Tool (GLT) through pipe for sulphide detection in very shallow holes has not been adopted. Hole cooling will not be practised as this would damage the environment and preclude temperature logs. The high-temperature logging cable will be on board at the beginning of this leg. As yet, it is not known which cable that will be. A 7-conductor TFE cable would seem appropriate. Morin reported that the USGS has such a cable. He agreed to explore the possibility of USGS donating about 200 ft to ODP to allow wireline operations in high-temperature zones by splicing.

[ACTION:MORIN]

Jarrard introduced the FY92 drilling schedule together with a proposed logging programme (Annexure III). The FY 92 programme begins with Leg 140, which depends on the results of Leg 137.

<u>Leg 140 Hole 504B</u>

The deepening of 504B would see the logging programme as previously recommended by DMP with the following subsequent DMP-approved addenda; packer/flowmeter and borehole seal. (Note: Item 7(vi) makes no reference to 504B for instrumented borehole-seal deployment).

The GLT is to be run again to allow a comparison of logs with and without the boron sleeve and because the earlier (unsleeved) log was of poor quality. It is proposed to add a high-spectral resolution geochemical tool to the logging suite because elemental flux arguments make this an ideal site.

DMP Recommendation 91/4

"A high-spectral resolution geochemical tool should be run in Hole 504B during Leg 140, in addition to the standard GLT. This will allow a comparison of sodium-iodide and high-resolution detectors as well as providing important new elemental flux data. The high-spectral-resolution tool should be subjected to land tests and full performance evaluation prior to deployment."

Leg 140 or 147 Hess Deep

This is not yet a mature proposal but it is evolving. No new proposal has emerged since the last Panel meeting. The logging programme is likely to be similar to that at 504B or 735B.

Standard suite	Dual laterolog
Temperature (High-T)	VSP
BHTV	Packer/Flowmeter
Magnetometer/Susceptibility	Drillstring packer

The inclusion of the packer/flowmeter presupposes that this tool will perform satisfactorily in earlier deployments. The logging programme will be refined when the proponents have developed a mature proposal.

Leg 141 Chile Triple Junction

This has previously been considered by DMP who recommended a standard logging programme with the wireline packer, geoprops probe and WSTP at selected sites. The WSTP should be the primary sampling tool. The wireline packer is withdrawn. Geoprops can be deployed on this leg, perhaps as a trial, in conjunction with the MDCB. This leg is also a possible leg for testing the LAST tool prior to its use at Cascadia (but cf. DMP Recommendation 91/2). Standard logs are being used to document gas hydrates. The pressure core barrel is to be used for sampling gas hydrates.

Leg 142 EPR Engineering

The principal aim is to evaluate the DCS Phase 2. Essential downhole tools are temperature logs and fluids samplers. In addition the BHTV is to be run, either the German dewared tool or the slimhole tool, depending on downhole temperature. If the DCB 7-inch hole is successful, logging with standard tools might be accomplished.

Legs 143/144 Atolls & Guyots A/B

These have not previously been evaluated by DMP. The proponents have included standard logging for most sites. A key issue is the link to seismic which might be satisfied by the sonic log. Panel suggested one zero-offset simplified VSP (for check-shot purposes) per leg, to enhance the sonic tie to seismic. Another key issue is the geochemical characterisation of the successions. If the enhanced-resolution geochemical log is successful at 504B, it should be considered for deployment in selected holes here. It is worth noting that Leg 134 drilled a guyot and geochemical logs provided clear messages that were especially valuable in cases of poor core recovery.

DMP Recommendation 91/5

"In addition to standard logs and targeted check-shot VSP, an enhanced-resolution geochemical log should be run in selected holes during Legs 143 and 144, provided that earlier deployments are considered successful. Such a tool could greatly enhance the geochemical characterisation of drillhole sites, especially with regard to trace elements."

Leg 145 North Pacific Transect

This proposal has not been evaluated by DMP. Sister legs are Ontong Java and Eastern Equatorial Pacific. Panel proposes full standard logs regardless of core recovery. In addition the French high-resolution magnetometer/susceptibility tool should be run in selected holes. There might be sufficient signal to detect downhole reversals and the susceptibility will be useful for core-to-log ties, site-to-site correlation, and as an indicator of variations in palaeo-wind characteristics.

DMP Recommendation 91/6

"In addition to standard logs, high-resolution magnetometer and susceptibility tools should be run in selected holes of the North Pacific Transect (Leg 145)."

Leg 146 Cascadia

The earlier DMP recommendations have been accommodated with a reservation concerning the time-consuming combination of wireline packer and geoprops probe. Panel view was that the wireline packer should be withdrawn. A proposal has been submitted by Greg Moore for funding an extra ship for 2.5 days to run an offset VSP with three-component tools. Panel encouraged this initiative but accorded it a lower priority than the basic logging programme.

Add-On Science

The Chairman referred to a letter he had received from Roger Larsen proposing a return to Re-entry Hole 801C in order to carry out the downhole measurements programme that could not be done when the hole was drilled during Leg 129. In many respects, 801C is a reference hole in that it penetrates old Pacific crust. To some extent, the hole is also a substitute for the geochemical reference holes, which were never drilled. The logging programme therefore seems especially desirable as a contribution to the scientific goals and legacy of ODP. The Panel supported Larsen's proposal and reiterated its earlier Recommendation 90/1 with the following modified wording.

DMP Recommendation 91/7

"Since Re-entry Hole 801C is located just three days out of Guam, the port call between Legs 143 and 144, this hole should be re-entered and the previously aborted programme of downhole measurements carried out. This exercise should be regarded as an addendum to the FY92 ODP programme. This is an important issue because Hole 801C penetrates very old oceanic crust and there is no provision for ODP to drill crust of similar age in the future."

15. Borehole Stability In Tectonically Active Areas

This Agenda Item was conducted as a working subgroup of DMP with a number of specially invited guests. The subgroup had been convened by Fisher and Karig as an integral part of this DMP meeting. Fisher provided the following report.

This meeting had been called to discuss hole instability problems common to tectonically active regions. In particular, it was intended to discuss drilling, coring and logging results from Legs 110 (Barbados Accretionary Complex) and 131 (Nankai Trough) with an eye towards upcoming Legs 141 (Chile Triple Junction) and 146 (Cascadia Margin). As an introduction, Fisher noted that the drill ship does not have a riser/return system and that our primary drilling fluid is sea water. In addition, the ship generally drills widely separated holes in varying lithologies, so that we often have limited prior insight into the formations to be drilled. During the last five years a great deal of effort has been expended to counteract hole stability problems, but this drive has been primarily directed towards unstable sands, swelling clays and hole cleaning. Our ability to log holes has improved significantly during this period, but experiences during Legs 110 and 131 were sufficiently bad to suggest that fresh ideas might be needed.

Foss explained that we have been able to keep holes clean, as long as hole geometry is good, but that we cannot keep a mud cake on the hole wall because we cannot afford to drill/core with mud. The main problems we encounter on the ship are fractured/disaggregated formations, flowing sand, clay swelling/sloughing, hole erosion and degradation (due to circulation and time), cutting avalanches, and bridging and ledging. We core continuously, and usually circulate throughout, except when breaking the pipe. When we pull cores, we slow circulation. We usually don't have problems with cuttings until we get to about 200-300 mbsf. Preventive measures taken during or after coring (mud pills, wiper trips) may or may not help, depending on conditions in the hole and the lithologies encountered. In some cases they may actually be harmful. It might be best to case off the uppermost, unstable sections of holes, either with a complete re-entry system or with the new, drill-in casing (DIC) system first deployed successfully during Leg 131. This system has recently been modified to include a mini-cone at the top. Cementing has been tried in fractured rock on the Mid-Atlantic Ridge, and was successful over only short (a few metre) intervals. It is likely to cause side-tracking in less indurated sedimentary formations.

Karig suggested that the majority of our problems during Leg 131 may have been mechanical. He showed a plot indicating that in any accretionary environment, where the largest principal stresses are oriented horizontally, borehole stresses may exceed the strength of the rock by a factor of 2 or more, even close to the seafloor. Breakouts are therefore to be expected. In accretionary environments, horizontal stresses may be 1.3-2.4 times higher than vertical stresses. After the upper sandy intervals were cased off during Leg 131, instability problems seemed to be restricted to the zone between the upper thrust and the decollement. Fill and sticking were greatly reduced below the decollement. There was smectite in the lower part of the section, but this material should be relatively impermeable, meaning that the chemical effects should have been restricted to a narrow region near the borehole. Also, high pore pressures should have kept drilling fluids out of the formation. Finally, clays should not be expected to swell much, except in the presence of fresh water.

Moos suggested that in-situ stresses could be the primary factor contributing to borehole instability in accretionary complexes. In fact, the distribution of stresses throughout the world suggests that compression may be the rule in much of the seafloor, and accretionary complexes may essentially be at failure even before drilling. In the past, people have assumed that the largest horizontal stresses should be about 1/3 of the overburden, but the two stresses may actually be similar. Stress concentrations are magnified by a factor of about 3 around boreholes. Weighted mud could help keep holes open, but could also induce hydrofracs with depth. This might not actually be so bad, as long as it did not degrade hole conditions, for it might allow the determination of stress orientations with the FMS or BHTV.

Morin discussed thermal stresses in boreholes and noted that reducing temperatures at the borehole wall puts the rock in tension at the maximum horizontal stress. Adding hot fluid to cold rock induces breakouts at the minimum horizontal stress. We could actually create hydrofracs at depth and breakouts near the surface through water pumping in the same hole. There is good evidence that this has happened in Hole 504B.

Pace explained that oilfield drillers usually control mud density through careful monitoring of returns, a technique not available to ODP. Industry also attacks surface hydration and osmotic forces through mud chemistry. Our ability to act here is also reduced, but we might be more successful if we pumped regular pills of polymer muds during all drilling and coring. Once breakouts form, it might be too late to act. Seawater chemistry is actually favourable much of the time, but we perhaps need to work on viscosity and density.

In a general discussion it was agreed that the ODP cannot afford to pump muds continuously. Heavy mud may be needed in accretionary environments to hold boreholes open long enough to log when lateral stresses are large. We have a limited budget, and limited space for mud and drill water storage. Although mud is sometimes pumped into ODP holes before logging, it has not generally been very heavy mud. It is easy-to-mix mud with a weight of up to 12 lbs/gallon on the ship, but higher weights will require more time-consuming mixing/agitation and more room for storage prior to pumping downhole. Pace suggested that there are heavy mud formulations available which could be maintained with existing facilities.

The possibility of drilling smaller holes was discussed, but this is going to take time to develop. The DCS system will not be available for Cascadia drilling. A hole this small (4") creates other problems because most logging tools will not fit in it. A small hole would take less mud to drill, however, and thus might allow more mud use. A 6" hole is probably the smallest that can handle conventional logging tools. We currently drill our smallest (non-DCS) holes with 9-7/8" RCB bits, 5" and 5-1/2" pipe, and 8-1/4" collars. Using 6" and 7" pipe might increase annular velocities but would be heavy and expensive. These possibilities are being explored by ODP engineers.

Slimhole DCS coring/drilling techniques likely to induce less formation damage could also require less "high-tech" drilling mud. A minimum hole size necessary to achieve downhole objectives should be considered by scientists planning legs during which DCS drilling may take place.

The working group agreed on the following recommendations and related observations pertaining to logging in accretionary complexes. These have been adopted by the Panel. Many of these comments could be applied to logging in general. It is appreciated that the scientists planning legs are best equipped to consider this information, anticipate lithologies, and evaluate the relative importance of diverse scientific objectives before working out a strategy for drilling, coring and logging. It is also recognized that their choices will have an economic impact on operations.

DMP Recommendation 91/8

"The following options should be considered to enhance the prospects of borehole logging in accretionary complexes.

(i) Case off the upper portions of unstable holes either with a full re-entry system or using the drill-in-casing system (DIC) with or without a mini-cone.

(ii) Drill offset dedicated holes for logging where cored holes become unstable; the dedicated holes can be drilled quickly to reduce exposure of the formation to seawater.

(iii) Log deep holes in several stages: during XCB drilling, this should not require additional pipetrips; during RCB drilling, additional trips may be needed.

(iv) After drilling and coring, flush logging holes clean and then fill with heavy mud, probably weighted with barite, with a weight of at least 12 lbs/gallon. In many cases, mud density approaching the formation density (19-22 lbs/gallon) will be more appropriate. Facilities and time on the ship will need to be available for mixing and delivering such a heavy mud. Flushing holes clean before using heavy mud may require pumping large volumes of fluid, particularly in cases where hole erosion is severe. The presence of barite mud will probably preclude lithodensity and photo-electric measurements (and will thus also reduce the quality of geochemical log measurements), but should have little impact on sonic, neutron porosity, natural gamma, resistivity and FMS logs. Borehole fluid sampling, packer measurements and BHTV runs will be compromised through the use of heavy mud (requiring that these measurements be made before heavy mud is pumped or in separate holes), but temperature logs may be improved if borehole convection is reduced.

(v) The need for heavy mud for each proposed hole should be identified and discussed by the co-chiefs, logging scientists, LDGO BRG representative and operations superintendent during the precruise meeting.

(vi) As with drilling muds, add chemical inhibitors and viscosity enhancers to logging muds when necessary.

(vii) Recognise that the sidewall-entry-sub (SES) is not designed to allow logging in unstable holes; it is best used in good holes with minor bridging problems.

(viii) **Deploy short logging strings where these are significantly easier to run than long strings.**

(ix) **The time needed to make special preparations for logging must be included in time estimates for all legs during which these preparations are expected to be necessary."**

DMP Recommendation 91/9

"Because expensive ship time has been wasted and tools have been lost while trying to log unstable holes, at least a major portion of a future engineering leg should be devoted to evaluating borehole stability strategies in an accretionary setting, in preparation for upcoming scientific programmes."

In summary, it should be possible to increase our ability to log in tectonically active regions, but it will take advanced planning and ship time, and it will be somewhat more expensive. While at sea, the decision to pump heavy mud will be made by the operations superintendent, in consultation with the co-chiefs, logging scientists, and LDGO BRG representative. Ultimately the importance of the scientific objectives which could be achieved through logging should be given strong consideration by those scientists planning future legs.

16. High-temperature Tools

(i) Temperature & Pressure

Anderson reported that the JAPEX PTF (pressure, temperature and flow rate) combination tool had been satisfactorily tested in a geothermal well. LDGO had been instructed by JOI to commence negotiating a contract with JAPEX for a 6-8 month lease of the tool at around $5000 per month. This would allow a land test in May and possibly shipboard deployment thereafter.

Lysne commented through the Chairman that he couldn't offer a Sandia tool for a back-to-back land test, as previously recommended by DMP, without having the exercise fully funded by ODP. Sandia has submitted a proposal to JOI, in response to a trawl, for developing high-temperature P and T capability.

Another possibility is the French high-T temperature tool.

The JAPEX and French tools are wireline tools. Sandia have a wireline tool and a memory tool.

(ii) Fluid Sampling

The LANL and LBL tools are scheduled for testing on Leg 137. They are being upgraded in the meantime. Respective tool diameters are < 2" (LANL) and 2.25" (LBL). The Sandia tool has been lost so SNL no longer have a sampling capability.

The aim is to seek redundancy in both temperature measurements and fluid sampling. The various tools are not in competition but are being evaluated in terms of absolute standards of performance. If two tools perform well, they can both be admitted.

(iii) Formation Resistivity

Anderson reported that the ARCO tool is in poor condition and LDGO recommend that it should not be double-dewared. The alternative is to purchase a slimhole tool (c. $30 000) specifically for double-dewaring. There is a need for a full engineering analysis of the double-dewaring problem in order to avoid difficulties later. The Panel felt that this was a high-risk venture but that it should be progressed because of strong thematic interests. There is some flexibility for reprogramming later if the higher priorities of temperature and fluid sampling run short of funds.

[Chairman's post-meeting contemplation. If a resistivity tool is to be double-dewared from scratch, it should be the simplest quantitative tool available. The Normal device would appear to offer the best compromise between tool simplicity and measurement capability. It can be made very slim and would benefit enormously from being run in a DCS hole rather than a large-diameter hole. The Normal device suffers from less perfect resolution, a shallower depth of investigation, and greater borehole effects than a laterolog. These problems could be partly overcome by the age-old ploy of using two Normal devices concurrently. With modern processing technology the shorter-spaced device could be used to define electrical boundaries, and the longer-spaced component to determine the resistivities using these boundary conditions in the model. All this should be well within the capability of a technician/student combination. This is not a Panel recommendation, but merely the documentation of some potentially useful thoughts, which the logging contractor is invited to consider.]

(iv) General

Lysne proposed through the Chairman that there is a need for interested parties to meet in order to chart a way forward in the high-temperature logging area, especially as there might be opportunities for interprogramme collaboration. Panel made no further recommendations at this time.

17. Wireline Re-entry

Deferred to the next meeting with apologies to the presenters.

18. Panel Membership

Three nominations have been received to replace Bobb Carson. Their names are not minuted in accordance with PCOM policy. The Chairman would approach these persons to ascertain their interest, to obtain brief resumes, and to progress the paperwork together with appropriate recommendations for the consideration of PCOM.

[ACTION:WORTHINGTON]

Heiner Villinger is to be replaced as the FRG Representative by Hans Draxler of KTB.

19. Next DMP Meetings

The Chairman noted that the Panel cannot function with less than three meetings per year. The Panel does not have the option to meet more frequently because of the need to contain costs. The plan for the next twelve months is therefore to continue with the policy of three meetings per year, but requesting extensions of these meetings where appropriate, e.g. to accommodate joint meetings with other panels.

The next meeting of the JOIDES Downhole Measurements Panel is scheduled to take place at the Lamont-Doherty Geological Observatory, Palisades, New York, during the period 4-6 June 1991. This meeting will include a joint session with the JOIDES Sedimentary and Geochemical Processes Panel and will encompass a tour of LDGO Borehole Research Group facilities. LDGO Liaison to host.

The subsequent DMP meeting is proposed to take place in Victoria, British Columbia, Canada, during the period 11-13 September 1991. This meeting would hopefully include a joint session with the JOIDES Shipboard Measurements Panel and would provide a further opportunity for a shipboard tour of the JOIDES Resolution. Canadian ODP Secretariat are asked to host.

The following DMP meeting is proposed to take place in Hawaii in mid-to-late January 1992. This meeting would hopefully embrace a geological field excursion. Wilkens to host.

20. <u>Bromide Tracer Experiment in Hole 504B</u>

Gieskes requested the Panel's endorsement of the following proposal.

During Leg 137 it is proposed to introduce a small quantity of sodium bromide (NaBr) into Hole 504B at the end of operations while preparing it for future re-entry. The NaBr would be mixed with surface seawater onboard, and introduced into the hole during the final stages of cleaning. The specific purpose is to add a tracer so that samples obtained during the next re-entry of Hole 504B, possibly during Leg 140, can use this tracer to establish the amount of mixing associated with the downhole flow of bottom water and exchange with basement fluids.

Sea water contains approximately 0.86 millimoles per liter (0.86 mM) of bromide ions, which compares to a total halide concentration of 559 mM, i.e., 0.15% of the total halide concentration. Bromide is an unreactive constituent in sea water, showing a constant ratio to chloride throughout the ocean with an implied residence time of well over one million years. It is proposed to spike the surface sea water that is to be introduced into the hole to approximately 3.5 mM, increasing the dissolved Br concentration by a factor of four. This would result in a change of the total halide concentration of under 0.5% and of sodium of under 1%, very close to the analytical precision of these constituents. We can determine Br quite accurately to 2% and thus any changes in the Br concentration and the Br/Cl ratio would serve as good indicators of mixing with other fluids. Br will act as a non-contaminating, conservative, non-reactive tracer. The four months between ODP Legs 137 and 140 should be sufficient to allow the determination of the quantity of downhole mixing into the upper 500 m of basement.

A minimal amount of NaBr will have to be added to the surface water for the desired increase in concentration. About 400 mg NaBr will be added per liter of surface seawater, or 30 kg NaBr per hole volume of 110,000 litres. The operations plan has been discussed in detail with ODP/TAMU, who consider it to be feasible. Due to the non-reactive nature of NaBr, and the negligible effects on the overall chemistry of the introduced seawater, it is felt that this experiment will serve its purpose.

The urgent approval was being sought of DMP, as well as of the Planning Committee, because time is running out for the purchase and delivery of the NaBr for Leg 137. An early endorsement is urged for this potentially useful and environmentally innocuous experiment.

DMP Consensus

Panel supports the proposal for a bromide tracer experiment in Hole 504B during and after Leg 137 as an important contribution to understanding fluid exchange with the upper basement.

21. Close of Meeting

The Chairman thanked Panel Members, Liaisons and Guests for their contribution to the meeting. The Panel Members acclaimed Bobb Carson and Heiner Villinger who were rotating off. The Chairman thanked both for their contribution over recent years. He also thanked Andy Fisher for his gracious hosting of the meeting and acknowledged the Directorate of ODP/TAMU for their generous hospitality. The meeting closed at 1330 hours on Friday 8 February 1991.

PAUL F WORTHINGTON
18 February 1991

ANNEXURE I

000113

COLUMBIA UNIVERSITY
Lamont Doherty Geological Observatory
Borehole Geophysics

Wireline Packer Project: Status Report

Prepared for
Downhole Measurements Panel
February 7-8, 1991
College Station, Texas

Prepared by
Erich Scholz

000114

Table of Contents:

Introduction:

This document was prepared in response to a request by the Downhole Measurements Panel during the October. 15-16, 1990 meeting in Townsville, Australia. Design problems and failures encountered in the existing system, as well as future intentions, will be discussed. We initially considered 3 possible pathways towards the future of the Wireline Packer Project: 1) Abandonment, 2) rebuilding and upgrading existing units, and finally 3) redesign/reconfiguring for Version #2. We have made the following conclusions:

1) Abandonment: We do not recommend abandonment at this time because a) there is no hard indication that either the experimental or design concept is flawed to the extent that it negates successful deployment, and b) there is significant interest and need within the scientific community to warrant further work.

2) Upgrading existing units: The scheme is based on using the majority of the subsystems as is. with no major reconfiguring of the sonde. In our analysis we have determined that. while somewhat less costly. this approach cannot address completely the most critical problem identified in the existing system. which is of course, sample contamination. This is primarily because the sample fluid hydraulic system cannot be restructured.

3) Redesign/Restructuring for Version #2: This approach is based on a) the reconfiguring of the hydraulic system. b) restructuring of the tool sections, and c) redesigning the electronic and hydraulic circuits towards a modular system. In particular. this scheme resolves the problems inherited in the original design's evolution.

We consider the third pathway to be the best choice. References in the text as to tool modifications, redesigns, and budgets etc. refer to this plan. Whenever possible, components or subassemblies from the existing tools would be used.

2 Sample Contamination:

Background:

The problem most critical in the existing system is sample contamination. The problem is compounded in a number of ways but is primarily due to the location of the sample bottles in the sample fluid hydraulic circuit. The bottles are currently located at the end of the circuit rather than on the suction side or beginning of the circuit. The fluid path is currently, from interval to bottle, some 50 feet. The inlet to the bottles should be as close to the sample interval as possible and plumbed such that there is maximum flushing of the tubing leading to the bottles.

The following lists sources of contamination in the existing design:

1. Cross-contamination (caused by dead zones in the filter and ion sensor sections where fluid is not adequately flushed and mixing occurs).
2. Hydraulic fluid (from the pump power system)
3. Annulus fluid (if the interval bypass valve fails to seal)
4. Silicon fluid (from the ion sensor pressure compensator)
5. Ion sensor filling fluid (if the sensor bladder were to rupture)
6. Tool connections/hydraulic fluid (caused by locating bottle inlets in the connector alongside hydraulic oil connections).

The system utilizes a syringe-type sample bottle which, although the best choice for this system, has an unavoidable dead or initial volume. Considering that the existing design utilizes control valves that are only rated to 400 PSI and located in another tool section some 10 feet away, contamination is inevitable. In fact, these valves were intended only to prevent the pump from prematurely filling a bottle and must be opened periodically while the tool is being run into the hole to relieve differential hydrostatic pressure.

Additional problems:

a) Post-acquisition, the sample is maintained at pressure by a check valve. Check valves could leak causing the sample to degrade, i.e. out-gas.

b) The valve control electronics have proven unreliable and occasionally actuate the wrong valve(s); more importantly, there is no feedback to the operator at surface as to which valve was actuated.

c) Sample bottles are constructed with 410 stainless steel which is stronger than 300 series stainless steels (316S.S.) but does not provide adequate corrosion resistance, i.e. samples could be contaminated by the sample bottles.

Solutions:

The intention of redesigning the sample fluid circuit is to minimize the unknown or contaminant sources such that sample quality is maintained and predictable. The sample or packed interval will continue to present a mixed volume but other contamination sources can be eliminated or minimized. By mixed volume, we mean that once inflated, the packers isolate a zone containing annulus fluid that must be displaced. That fluid will not be directly displaced but will mix with the incoming formation fluid. Therefore, it is unlikely that a 100% formation fluid sample could be obtained (in a reasonable time period). A Dilution Series test method can be used to overcome this problem. In this method a minimum of 2 samples, spaced in time, would be taken and compared. Obviously, more samples would improve resolution. We have chosen 8 bottles per sample bottle tool section providing either 4 zones @ 2 samples/zone or 2 zones @ 4 samples/ zone. In addition, an operator may elect to sample the annulus fluid to provide a background or control sample.

By using a modular design, additional bottle sections could be added to a tool string without modification to the sonde. For that matter, more bottles could be added to the tool section with the only restriction being overall length. A modular design also allows changes of bottle size or type, and control valving with minimal impact on system design. More on modular design later.

In order to achieve this objective, the sample bottle inlets must be located as close to the fluid intake as possible. Sample bottle type and control valving must be carefully chosen. We have elected to stay with a syringe-type sample bottle for the following reasons.

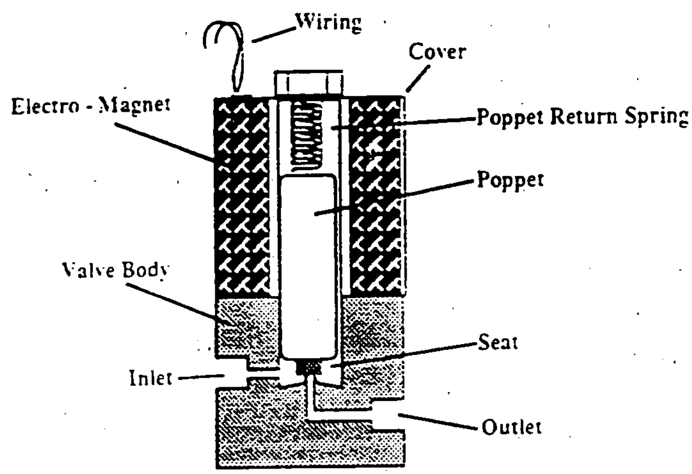
Sample Bottles:

There are essentially three types of sample bottle designs: the Coil Tube, the Evacuated cylinder, and the Syringe. The Coil tube is favored among many chemists but would require twice the number of valves to control it. The Evacuated cylinder, on the other hand, is easily controlled but the extreme pressure drop at the orifice when the bottle is opened will damage the sample, gases in particular. Evacuated bottles do not afford control of differential pressure, critical in a large bottle volume. The Syringe combines the simplicity of the Evacuated with the only compromise compared to the Coil tube being the "dead volume". Were the control valve installed directly at the inlet to the bottle the "dead volume" would be limited to less than a C.C.

In preparation, the syringe bottle would be cleaned and then vacuum evacuated before closing the control valve. Downhole, the bottle is maintained evacuated until a sample is taken, then the valve must seal against positive pressure as the sample is returned to the surface. Therefore, bottle control valves must be rated to full hydrostatic pressure (10KPSI) and must seal bidirectionally and "bubble-tight".

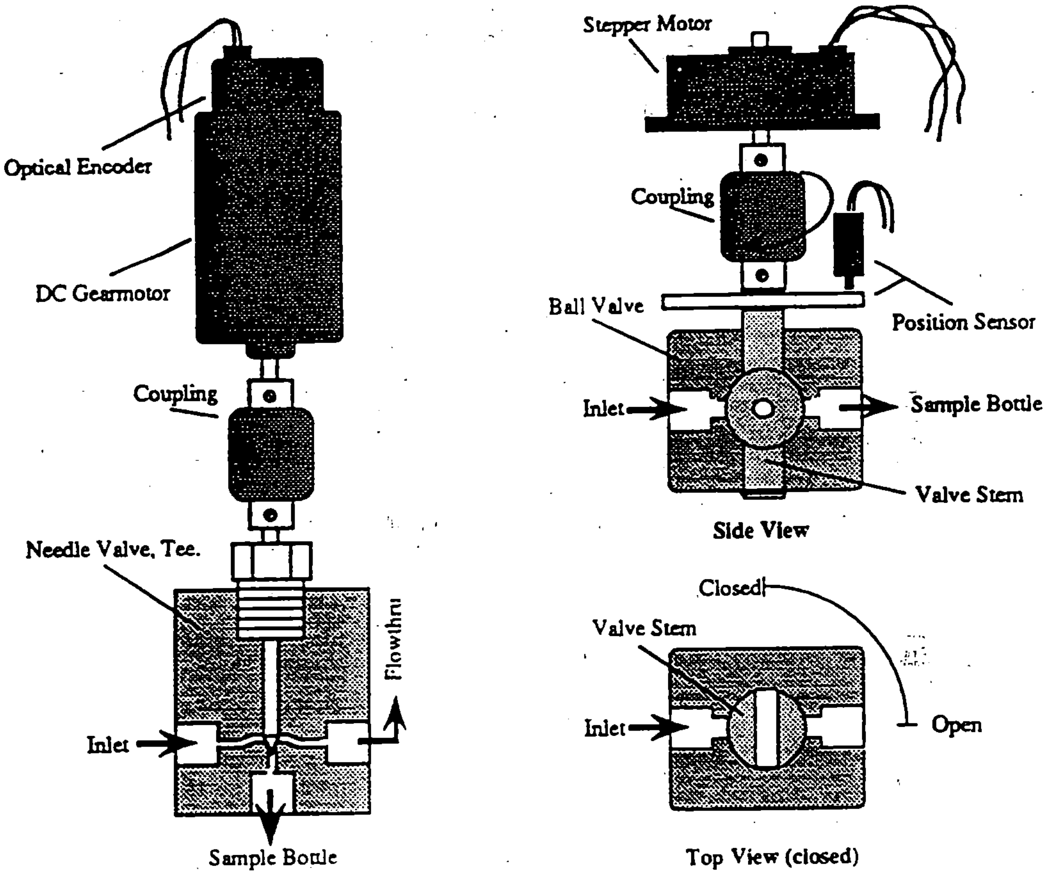
Valves:

There are basically four valve designs that are typically rated in this pressure region: the Solenoid valve, the Explosive valve, the Ball-valve, and the Needle valve. There are two types of solenoid valves; both are easily controlled by simply applying power to actuate the valve. Solenoids are attractive because the control is so simple. There is the Direct-acting valve and the Balanced poppet or pilot valve. Unfortunately, both designs have drawbacks. The direct-acting valve can only seal in one direction, as indicated in figure#1 The Balanced poppet design is available in higher pressures and most seal bidirectionally but, in order to maintain a "bubble-tight" seal, the fluid must be filtered to >1 micron. *Circle Seals Control*, for example, offers a 6KPSI valve and will quote a 10KPSI valve with some reservation about seat/seal life and "bubble-tight" specifications (even with filtration). Besides the high potential for clogging with such a fine filter, the geochemists I have consulted were not enthusiastic about the potential damage the filter could do the sample. We have elected not to use solenoids for sample bottle control (but will likely use several in the pump control circuit where sealing is not critical).



Figure#1: Typical Direct-acting Solenoid valve. Note that positive pressure at the outlet port will easily overcome the poppet return spring.

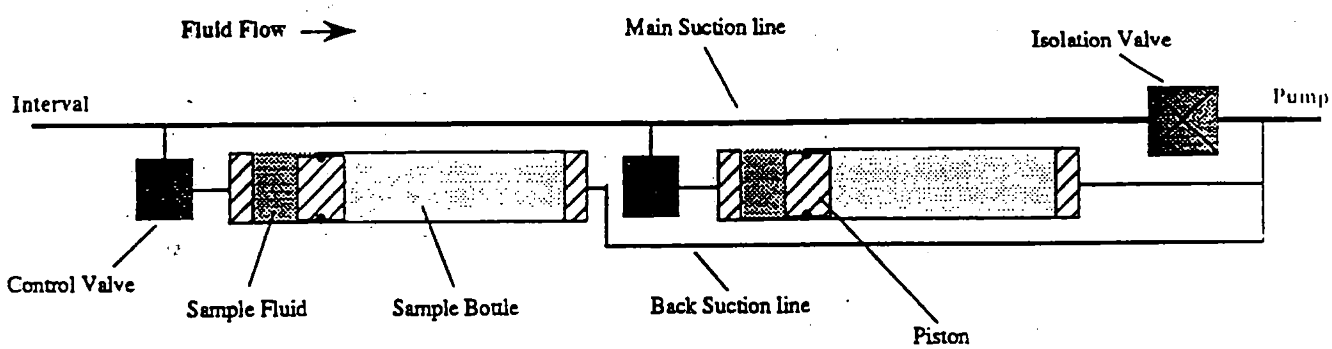
The Explosive valve is an interesting device typically employed only in high reliability applications such as munitions. The valve is comprised of a sliding spool that is operated by a small class "C" explosive. This valve is easily controlled requiring only a capacitive discharge circuit to operate it. The explosive charge and subsequent gases are captive in the actuator body and do not present a safety hazard. There is no exposure of the fluid to the explosive gases. The valves are guaranteed to pass a 10^{-7}cc/sec Helium leak test at max. differential pressure (leakage in a fluid system would be nil). Unfortunately, the valves are single use and would cost between $700-1000 depending on quantity. It is unlikely that we would use an explosive valve.



Figure#2: Comparison of Needle valve vs. Ball valve designs with motor operators

A Ball valve design could be used, driven by a stepper motor. The typical ball valve "stem" rotates 90 degrees from positive Off to full On and back again. Sensing valve position is relatively simple using hall-effect or optical sensors and a perforated disc. See figure#2. Ball valves tend to be self--cleaning and less susceptible to damaged seats and seals (caused by particulates) than solenoids. A disadvantage is that 10KPSI nears the upper limit of the pressure rating for most ball valve designs. The *Swagelok Company* offers a 10KPSI Ball valve available in 316 Stainless or Hasteloy-C.

Needle valves are available in higher pressure ratings (in excess of 60KPSI) and have been employed towards this application in the past. The Barnes water sampler, for example, uses a motor driven needle valve. Both the Ball and Needle valve designs are somewhat long (5-8") and require more control electronics than the previously mentioned methods. A drawback to the Needle valve design is the lack of a positive indication that the valve is fully closed (because needle valves are "multi-turn" and valve stem wear can change where the stem seats). This is overcome in the Barnes design by torquing a rubber coupling which has proven effective. An advantage compared to the ball valve is a more reliable seal. *Autoclave Eng.* and *HIP Corp.* both offer a small 15KPSI rated needle valve that would be appropriate for this application.



Figure#3: Conceptual illustration of sample fluid circuit required to place the sample bottles in the suction circuit.

The suction circuit will operate in the following manner: During pumping cycles,fluid will pass through the main suction line to the pump via an isolation valve. When a sample is desired the isolation valve will be closed and the appropriate bottle's control valve opened. The pump will then remove fluid, via the back suction line, from the backside of the piston drawing it down the bottle until the bottle is completely filled with sample fluid. The bottle control valve will then be closed and the isolation valve opened.

We plan to use a motor-driven Needle valve for the bottle control valve. The decision is based primarily on seal reliability. The Isolation valve will be either a motor-driven Ball Valve or possibly a Solenoid (this seal is non-critical).

Additional Modifications:

The geochemists I have consulted suggest that a 400 ml sample is much larger than required; in fact, 100 ml would still yield plenty of sample for shipboard experiments and archiving. There are other benefits to reducing the sample volume. For example, in order to retain a sample at pressure the bottle must be completely filled; in a lower permeability test interval a smaller volume can only improve that situation. Smaller bottles will also permit more bottles to be installed in a tool section without increasing the section beyond a manageable length. New bottles will be made reducing sample volume to 100ml. The bottles will be machined from Hastelloy-C, Titanium, or MP-35N to improve corrosion resistance.

Modular Approach:

Overview:

Modular systems are employed at various levels throughout the logging industry. Schlumberger utilizes a modular system exclusively. Likewise, the DMT digital televiewer is based on a modular design. In electronic design, each function (in the DMT tool for example, orientation, acoustics, gamma ray etc.) is controlled by an independent microprocessor communicating on a network or data bus. Each function is a Node that can be instructed and interrogated independently. Nodes, in general, would be comprised of a microprocessor, a serial communications controller, the appropriate power supply(s), and finally the front-end. The front end is tailored to the particular function be it data acquisition, valve control etc. Additional nodes can be added or removed from the tool string without effecting the another nodes function. This is be particularly beneficial if, for example, one wanted to add additional sensors or experiments to the base system. More importantly, this approach allows for the development of a common processor design where only the front-end and program code differs from node to node.

A modular system, with respect to mechanical and electro-mechanical design of a logging tool dictates that each tool section or cartridge be wholly independent and self supporting, i.e. a sample bottle section would contain not only the sample bottles but also the control valves and node electronics required to support the bottles. In another example, the pressure compensation cylinder for the pump/motor section would actually be located in the pump/motor rather than in the sample bottle section (which, incidentally, provides for a tighter oil system).

Background:

The existing system is a fixed system. Data acquisition cannot be adjusted (except by hardware modification) for changes to data rate, A/D gain, sensor type and number etc nor are there extra A/D channels or digital inputs (for a flowmeter) available. There is no implementation of gain range techniques that could be used to improve transducer resolution. Note that this becomes critical in the case of pressure measurement where data is presented in +/-2.5/3.0 PSI steps (10KPSI full scale @ 12 bit A/D resolution) and the max. interval differential, with the standard packers, is limited to 350PSI. It is desirable to incorporate a software selectable gain-ranging amplifier with the ranges 0-5KPSI, 2.5-7.5KPSI, and 5-10KPSI. This was suggested by Baumgartner and myself at the first casing test at Tam International. At the time, in an attempt to improve resolution, the transducers were offset for a 5-10KPSI range (question, how can surface or casing tests be conducted at low pressures if the transducers are fixed at 5-10KPSI?).

The solenoid control is similarly rigid requiring a) that all valves be solenoids (of similar design and power consumption), b) that 2 valves and only 2 valves be actuated at all times, and c) that a max. of only 8 valves can be installed (to perform all tool functions including packer and pump control). What makes the system rigid is that the power supplies are of the constant current variety, i.e., the tool must consume a fixed amount of power in order for the power to be regulated and within spec.

The biggest problem, electronically, is data/command transmission. Data is transmitted to the surface and the solenoid "commands" sent from the surface via a half-duplex single-ended current modulation technique. There is no method for error detection or correction. There is also no feedback of "surface command" signals, i.e. valve positions, to verify that the tool is operating as instructed. Command transmission from the surface frequently results in errors leading to wrong valves or "extra" valves being actuated. Valve control is critical in this application and directly effects sample integrity. An operator cannot, with confidence, present samples to the scientific party under these circumstances.

Noise generated by motor operation compounds the problem primarily with respect to sensor data. Errors in the data are so high while the motor is running that, to date, an operator would need to shutdown the motor just to check the pressure. Again, since there is no error detection, erroneous data cannot be rejected by software and certainly can't be corrected.

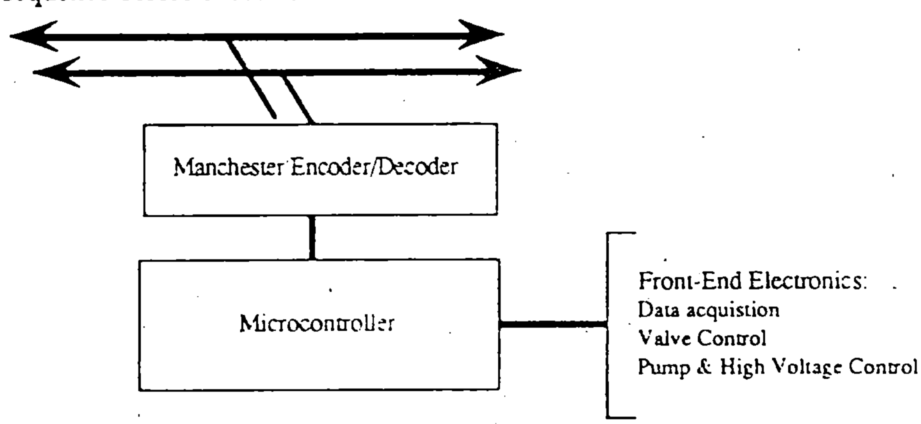
Ironically, the system was designed with redundant electronics but only the primary side has the sensor signal conditioning and the secondary side the low voltage supply for the motor control. Therefore, the two are not truly independent nor redundant and the attempt only further confuses the situation.

Mechanically, the problems in the existing system stems from the arrangement or configuration of the various subassemblies. Many problems are associated with the long evolution of the design; for example, in the very first version of this tool the pump was driven directly by a single phase AC motor. The sensors and D.A. electronics and the pump, motor, and valves were assembled as a single tool section. This design did not perform well and was abandoned. The current pump design works quite well but when implemented the pump system grew considerably in size and required the addition of a high voltage power supply. A single tool section could no longer house the combination and the the pump/valve system was removed to form a second tool section. The vertical arrangement of the subassemblies has severely complicated the design of the tool connections requiring 3 high voltage feedthrus. More on this subject will be discussed in Tool Layout and Tool connections.

Solutions:

The basic node will be comprised of a microprocessor based controller. Data and commands will be exchanged within the tool along a two-wire serial data bus. Rather than use an RS-232 or NRZ (non return to zero) method, we will incorporate the Manchester encoder/decoder for improved noise immunity and error detection. The Node located at the top of the sonde will also house and control a differential FSK (frequency shift keying) transmitter/receiver. The FSK will handle communication over the wireline with the surface. The combined technique should be capable of operating in a high noise environment at data rates substantially higher than required for this sonde.

Commands will be transmitted in full-duplex mode where the receiver echoes a data frame back to the sender for comparison. If errors are detected by the Manchester encoder (at either location) or the data does not compare bit for bit, the instruction is retransmitted. Operations will be redundant, i.e. will require several command or data frames in proper sequence before execution.



Figure#4: Conceptual illustration of a typical Node.

The Manchester encoder/decoder is particularly suited to this application due to the structure of the data frame. The frame can be configured for up to 28 bits addressing up to 32 nodes. The frame (if configured similar to MIL-STD-1553) contains 4 functions: Sync, Address, Data, and Parity. The Manchester is a self timing device, the clock is imbedded in the data. The Sync begins the frame and identifies it as either a command or data word. The address would, in our application, identify either a particular node or transducer depending on whether the Sync indicated the frame was command or data, respectively. Data is self explanatory; in a command frame it would contain the instruction, in data frame it would contain the binary value for a given transducer. The parity bit is used for error detection. This provides for inherently reliable data transfer.

The Manchester has been proven in the downhole environment and is the basis for the DMT digital televiewer data transmission. The device was originally designed to network instrumentation in military jet aircraft.

Additional Modifications:

Power supplies for the valves and electronics will require redesign. Downhole supplies will be replaced with wide input range DC-DC converters. Traditionally, the wide variation of voltage at the cablehead, caused by the wireline resistance and changes in the current, was too severe for a voltage mode method to be used. Switching power supplies have recently become available with input ranges as wide as 125-375 volts DC which should overcome that problem.

Permeability:

Background:

The tool, to date, does not have a flowmeter nor is there provision for one. A flowmeter is essential for permeability measurement and a monitoring aid the operator really shouldn't have to do without.

Initially there was discussion of using a pulse decay method for permeability measurement which wouldn't require a flowmeter. In a pulse decay test a volume of fluid is injected or withdrawn from an isolated interval creating a pressure pulse. The pressure is monitored until the interval returns to hydrostatic. The data is then compared to a type-curve and the permeability estimated. Unfortunately, the combined effects of the following problems negate this method:

a) The peak value of the pulse must be known. Because the motor causes noise in the data and the data stream does not recover until several seconds after the motor is shut off, this is not possible.

b) The pump system is effectively constant horsepower. Therefore, the maximum pressure drawdown is inversely proportional to the max. flow (and effected secondarily, by the system pressure drop). In other words, in a tight formation the pressure is at the maximum (350PSI) and the flow relatively low. In the other extreme, the flow is at maximum (~1GPM) and the interval pressure relatively low except that the measured pressure is offset by the system pressure drop. This means that the peak pressure will vary from zone to zone.

c) The pump is difficult to control, taking several seconds to come to speed and several to cease. The pump cannot be turned on and off quickly. Thus, there is a wide variation in the volume of fluid pumped in a short duration test indicating that a constant volume method is not feasible. Furthermore, because the volume varies, the depth of penetration or influence will vary, which will effect recovery.

d) The method dictates that the recovery must be several times longer than the rise-time of the pulse and that pressure data be recorded at a rate such that the curve is well characterized (the data rate is approx.4 seconds per measurement). Therefore, the conventional pulse-decay test is usually only attempted in low permeability regimes where the formation recovery will be slow. The Catch-22 is that in zones where we can reasonably expect to recover a sample the pulse-decay test is inaccurate or impossible.

Solution:

We intend to add a turbine flowmeter to the main data acquisition cartridge in the redesign. We have selected a turbine type because it is most easily integrated into the system. Ultrasonic and Mass flow designs are attractive because of the ability to pass slurries but these transducers would require a great deal of support electronics. In addition, a rather expensive custom design would be required for the Mass flowmeter in order for it to be fit in a logging tool. There is some debate about turbine flowmeters, the main concern being filtration and turn down ratio (or resolution). The latter can be improved by using a RF (radio frequency) pickup as opposed to the more typical magnetic pickup (which impose a load on the rotor). An example would have a range of 0.02-1.3 GPM. The filtration problem can be reduced by using tungsten carbide bearings. Manufacturers state that 100 microns would be acceptable for long life. We will need to run verification tests in the lab before proceeding. *Flow Technology* and *Hoffner Controls* both offer high quality products with which we have had good success in the past.

Sensors:

Background:

There are three types of sensors present in the system: Pressure, Temperature, and Ion Electrodes. The pressure transducers are the strain-gauge type and tend to have a fairly large temperature drift that should be addressed. Bear in mind though that we are not as interested in the absolute pressure but rather the change in pressure during an experiment which de-emphasizes the point. The temperature transducer is a platinum RTD and performs well.

The Ion electrodes are the problem. There are 4 electrodes: ph/Cl., Na., Ca., and a half-cell reference. The electrodes are filled with a silver salt or Caromel solution in contact with a membrane sensitive to the element being measured. The electrode output is compared to the reference electrode. Unfortunately the electrodes are extremely fragile, foul easily, and must be pressure compensated. The pressure compensation bladders tend to leak and rupture easily. Dr. Frolich (LDGO) suggests that these types of sensors are difficult to calibrate and use accurately in the laboratory due primarily to extreme temperature and pressure sensitivity. Their use also seriously complicates mechanical design. An attempt at a downhole application is probably a waste of time.

Solution:

The Ion electrodes will be, for the time being, abandoned. We will instead use a fluid conductivity measurement similar to those used in oceanographic CTD instruments. The fluid conductivity sensor is a simple and rugged device which have been used reliably in the field for years. The temperature probe will need to be located with the conductivity probe for proper compensation.

The fluid conductivity, temperature, packer and interval pressure transducers will be combined with the flowmeter, data acquisition and node electronics to form a new tool section. The section will be called the Sonde Measurement cartridge and will be located between the Pump/Motor and Sample Bottle cartridges. This change in location will shorten the sample fluid circuit and greatly simplify the tool connections between cartridges.

If, in the future, additional measurements are desired, an Auxiliary Measurement cartridge could be built and, again, via the modular approach, installed in the system without additional modification. Future measurements might be, for example, fluid density or differential pressure measurement (for improved resolution) or, of course, the revival of chemical measurement. We; however, do not wish to commit to additional measurements at this time, preferring to concentrate on the primary system.

Filtration:

Background:

During Leg 133, as I indicated in my brief in Townsville, the main filter assembly clogged preventing further testing (hole 816-C). In fact, the filter eventually collapsed allowing slurry to invade the system. This was compounded by problems with the the By-Pass Intake.

The By-Pass intake consists of a valve that connects the pump intake with the annulus and is only opened during packer inflation.. The bulk of the fluid used to inflate the packers is drawn from the interval while the By-Pass is intended to allow the packers to be fully inflated even if the interval is impermeable. Note that without the By-Pass, an operator would not be able to differentiate between a permeable zone and a poor packer seal. Unfortunately, there was no attempt to filter the By-Pass intake which, incidentally shares porting with the pump discharge and packer deflation lines. Therefore, the failing of the packers to deflate completely can be partially attributed to reduced flow through the port.

Solution:

The main filter is a three-fold problem. Firstly, the filter area needs to be increased. Secondly, the allowable differential pressure rating of the filter element must be increased to prevent collapse. Third, the location of the filter must be changed. Right now the filter is housed in a small pressure case above the packers. As fluid is pumped through the system the filtrate is deposited in the pressure case until, in the case of 816-C, the case is completely filled and flow choked. The pressure case could be lengthened which would allow for a longer filter (and more filter area) but that would also increase the "dead volume" inhibiting flushing.

The best solution is to locate the filter in the interval between the packers. That way the filtrate would be left where it started, in the interval, and the "dead volume" is removed. This will require either a custom filter or more likely the modification of an existing filter. I am still in the process of selecting a manufacturer. *Norman Filtration* has an extensive line that we have used in other downhole systems successfully.

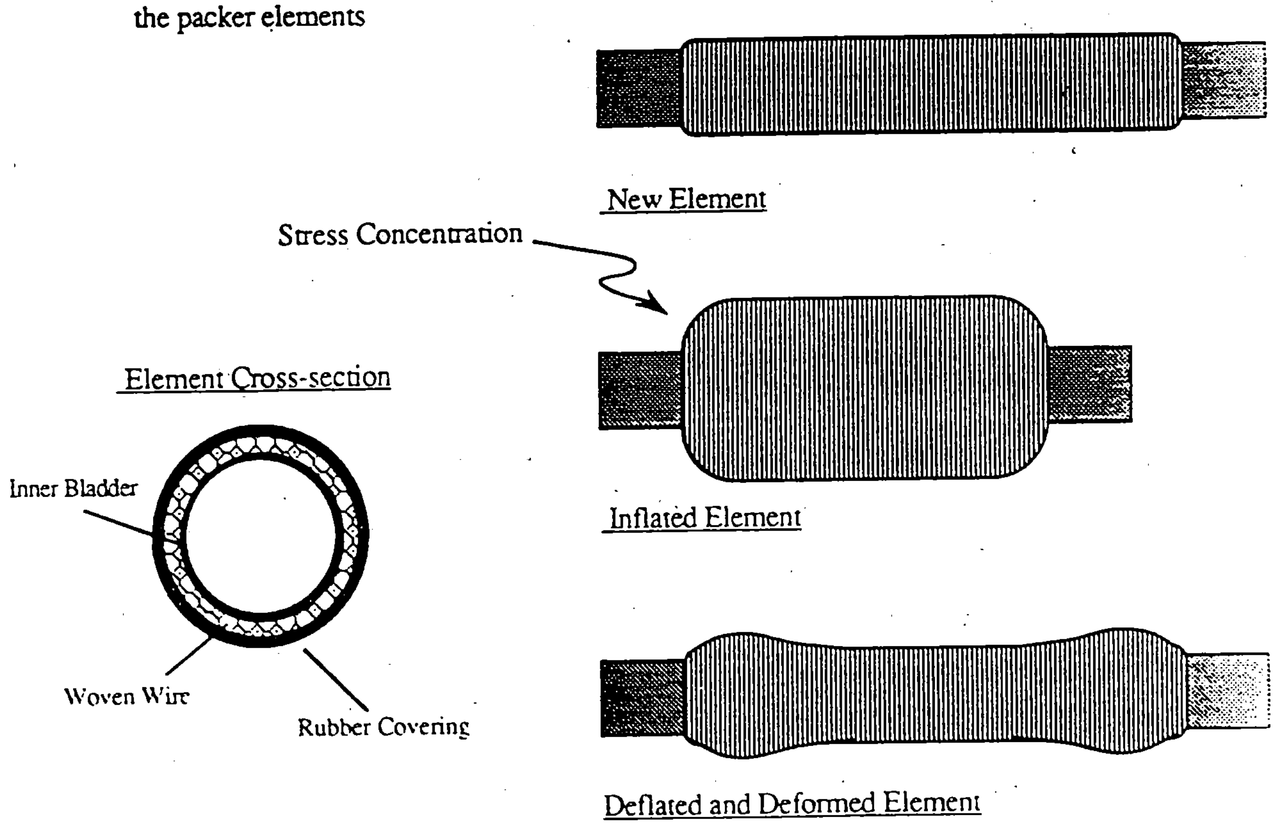
With regards to the By-Pass Intake, obviously a filter must be added. In addition, the port must be isolated from all other fluid lines to remove the possibility of a clogged filter preventing packer deflation.

Packers:

Background:

When the tool was retrieved from hole 816-C the packers had not fully deflated and became stuck in the BHA (bottom hole assembly). The tool was pulled free of the packers by use of the shear pin assembly and brought on deck. The packers were later retrieved from the BHA where they had become wedged. The shear pin assembly is a safety device intended to allow retrieval of the main body of the tool in the event that the packers become stuck in openhole or fail to deflate properly.

As mentioned in Filtration section above, the packer failure maybe due in part to the By-Pass port being clogged but, upon inspection at the surface, deformation was noted in the packer elements



Figure#5 Element Construction and typical deformation at stress concentration.

TAM International, Lamont, and shipboard tests indicate the the packer elements will deform if inflated beyond a certain point. The post-deflation diameter is a function of the diameter to which the packer was inflated, how many inflation cycles the packer has been subjected to, and the individual packer element (there is some variation in manufacture). The point at which the packer deforms is also dictated by inflation cycles and the individual element. This deformation is caused by a stress concentration at the edge of the binding where the bend radius is most severe. In the packers we have tested, the elements will, in a free or unconfined inflation test, reach a final diameter of ~13 inches O.D. +/- 0.5 2 350PSID. Upon deflation, the elements typically return to ~4.25 inches O.D. +/-0.25 with a new element being 3.65 inches O.D. In actual use, we estimate that the packers will operate in holes up to 12.5 inches with TAM Inter. guaranteeing performance to 10.5 inches at full rated temperature.

Solutions:

There has been some discussion about reversing the pumps to draw the packer elements down hydraulically. We will need to run some tests in the lab as soon as possible. I had intended on presenting that data here but the sea freight was delayed leaving Australia and we have just recently received the tools. TAM Inter. suggests that this will not work 100% and I agree but there is a good possibility that it will be all that is required. The I.D. of the drill pipe even with the joint upsets is not the main restriction, the problem is in the BHA. After the 816-C tests, the elements were approx.4.3 inches at the bindings and the middle was ~4.1-4.2 inches. That means that the contact area was along almost the entire length of the elements. If the packer were pumped down, the non-deformed middle portion of the element would be drawn in so that even if the deformed area at the bindings remain oversized, the contact area and resulting friction would be reduced dramatically.

Another more complicated approach would be to mechanically pull the packers back to shape. This has already be done in the case of the drill stem straddle packer that uses springs to pull the lower binding back. In TAM's design, the upper binding is fixed to the packer mandrel while the lower binding is free floating and allowed to move up and down the mandrel. This is done so that, as the packer expands during inflation, it is allowed to shorten until set. Post -deflation, if a force were applied to the lower binding, pulling it down, the packer element would be stretched back to shape. In the wireline packer a spring would not be practical. Instead a hydraulic force would be applied by designing a piston/cylinder arrangement into the lower binding. The pump would then be use to pump the binding into place. This option would obviously be avoided unless deemed necessary by the results of the drawdown test mentioned above.

As a third option, assuming clearance from ODP/TAMU, we plan to design a Go-Devil connection to the drill stem straddle packers. This would be used in lieu of the high expansion packers. This option would be taken only in Reentry holes where the drill stem straddle packer was already scheduled and/or the loss of a high expansion packer assembly would be detrimental to future operations.

Additional Modifications:

TAM International used a standard 48 inch packer element for this tool. When fully inflated the wall contact is only about 15 inches long. This may not provide an adequate seal in some situations. We intend to replace the elements with a 60 inch elements from TAM. This will require machining new packer mandrels and piping only.

HVPS:

Background:

The downhole high voltage power supply converts ~400 volt DC power into the 3 phase 330 volt AC that powers the motor. Four of the seven conductors of the wireline are used to transmit the DC power. On leg 133, hole 812-B the supply failed on deck. The first failure occurred when the tool was rigged. A high voltage connector shattered in the tool connection between the electronics and the pump sections. The two subsequent failures were caused by wires broken whilst repairing the high voltage connector. The HVSP is poorly constructed and is not rugged enough for downhole service.

The location of the Ion sensor chamber above the supply compounds the problem by requiring 5 hydraulic lines to pass through the HVPS pressure case. Worse, because the ion sensors must be serviced before each logging run and the HVPS cartridge removed to access the sensors, there is a high risk of flooding the HVPS pressure case. The pressure integrity of the tubing cannot be tested to the full 10KPSI rating with the current arrangement.

The power supply causes excessive noise on the wireline. The AC output of the power supply is a square wave not a sinusoid. The square waves produce harmonics that interfere with data transmission. High fluctuations in motor current and poor power filtering at the surface add to the problem.

Solutions:

I have already considered and abandoned two alternative designs for this power supply. High voltage D.C. power is extremely dangerous. The current system operates at 500 VDC at the surface which could be fatal in the event of an accident. AC power, at comparable voltage, is considered safer than DC power because of muscular response. TAM International built their second generation wireline packers using a 3 phase AC surface supply but that system was design to run on short wirelines. Unfortunately, in order to provide enough power on a 30,000 ft wireline it is estimated that, with 6 out of 7 conductors used (2 conductors per phase), the surface voltage would be 880 VAC. The surface voltage is higher, even though more conductors are used, because the motor requires 3 phase power and the voltage drop on 2 conductors is twice the drop on 4 conductors. There would be little or no improvement in safety provided by this approach; furthermore, the higher operating voltage increase the chance of arcing the cablehead or wireline. It should be noted that tools requiring high power, such as the Schlumberger RFT, have a reputation for finding leaks or weak spots in wireline insulation.

The second alternative considered was the use of a sinusoidal downhole supply with DC power transmission. This would cut down on cable noise since noise from a 60 Hz sine output could be filtered easily. This type of design; however, is basically a large power amplifier that would be much too inefficient.

Conclusion:

The design concept of the current HVPS will be retained. In restructuring the sonde, the HVPS will be moved to the top position in the sonde and directly attached to the modified pump/motor section to form the HVPS/Pump cartridge. The pump section will have been shortened by moving the bottle valves but the packer control valving will remain with the motor and pump. This change eliminates the hydraulic lines in the HVPS pressure case and allows for more electrical feedthru's in intermediate bulkhead (between HVPS and pump/motor) which will simplifying motor speed sensing and packer valve control. This also simplifies tool connections by eliminating the fragile high voltage connectors.

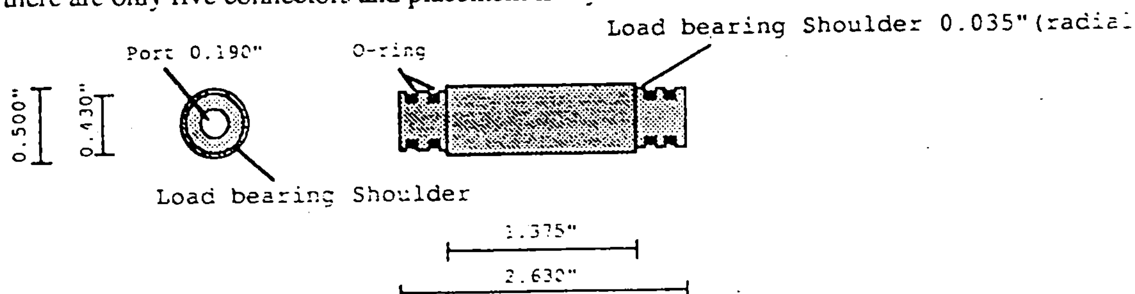
The electrical hardware of the HVPS will need to be completely rebuilt.
There will be the addition of the Node electronics and the front-end electronics for packer valve control, motor control, and motor speed sensing. Improvements to the noise problem can be made by adding a capacitor to dampen the wireline, but again, the data transmission method must be improved.

Tool Layout and Connections:

Background:

Figure #7 illustrates the layout of the existing tool. The layout of the various functions directly effect the problems of sample contamination (as previously indicated) and tool connection. The tool connections are a critical point in the design requiring multiple electrical and hydraulic interconnections. The existing design is not rugged enough for offshore use. The internal connectors are much too fragile and difficult to assemble. On leg 133, hole 812-B, the first attempt to rig the tool was done horizontally (by suggestion of TAM Inter.) to avoid damaging the electrical connections. Unfortunately, excessive bending in the tool string shattered one of the high voltage connectors. Note that in standard practice a logging tool of this length would not be rigged horizontally because of safety considerations. In the second two attempts at that site the 4 sections of the tool were rigged vertically. Because the electrical connections must be made manually, this is difficult to accomplish and dangerous for the operator. Even in good weather its impossible to prevent 15 ft. and some 150 lbs. of tool from flailing around. Slack in some of the wires is less than 1 inch. In addition problems, the 9-pin solenoid connection is poorly constructed without an outer sheath for mechanical protection or waterproofing and high voltage feedthrus are extremely fragile. Note that cracked insulation typically results in a short circuit that causes permanent damage to the HVPS.

The problem is compounded by the design of the hydraulic connections or bulkhead connectors. Besides the alignment problems during assembly, these connectors must support the entire hydrostatic load (100KLbs. @ 10KPSI with a 3.5 inch O.D. sonde) because the connection is at atmospheric pressure (see figure #6). Connections are subjected to bending moments caused by ship heave (with packers set) and bridge bashing. Failure could result in collapse of the connection resulting in loss of the lower portion of the tool string. The connection between the HVPS and the motor is particularly dubious as there are only five connectors and placement is asymmetrical.



Figure#6: Bulkhead Connector from the lower tool connection (axial and side views).

Solutions:

In the existing design there is a collar on the upper half of the tool connections that secures the assembly. This collar is free to rotate and floats in the crossover containing the connectors. The collar has a female thread. The upper half of the connection is not captive or guided to the lower half during assembly. Schlumberger and most other logging companies design for captive connections so that during assembly the weight of the upper section can be set on the lower section and tool cannot swing uncontrollably. In addition, the internal connections are self aligning and make up automatically as the joint is tightened.

In redesigning the tool connections 3 criteria are dictated; the joint must make up easily and safely, all connections must be made automatically, and the joint must be rugged and the load supported by bulkheads. In order to achieve this the number of hydraulic connections must be reduced. Currently the upper connection contains 5 hydraulic lines while the lower contains 9 lines. This can be reduced to 2 connections supporting all functions. One will be suction, the other packer control (see Fluid paths,Figure #8). There is the added benefit of less potential for leaks with fewer connections. The hydraulic connections would consist of a captive tube which inserts into a O-ring sealed receiving port. The hydrostatic load would be supported by the bulkheads and pressure cases rather than the small connector tubes. Signal and other electrical connections would be made using commercially available connector inserts similar in method to Schlumberger's; however, by moving the position of the HVPS to combine with the Pump/Motor, the high voltage connections will be eliminated altogether (compare figures #7 and 8). Schlumberger's joint design uses a captive collar with a male thread that tightens into the female thread of the pressure case.

Pumps and Packer Control:

Statement:

There are a number of minor problems here. One modification that will carry through to all cartridges is construction of better chassis. The chassis, where present, are poorly designed, difficult to work with, and flimsy. For example, the oil pump is mounted to the motor with only one screw.

The water cylinder will be partially rebuilt removing incompatible components (aluminum and water don't mix). The packer control pilot valve or dump housing will be modified to use the oil pump pressure to operate it rather than the water pump pressure. This will allow higher spring forces to be used on the pilot spool, decrease the chance of particulate contamination preventing operation, and allow larger ports for faster deflation. The packers will still be inflated by water. The valves that control the packer control pilot and the valves that control the By-Pass and other functions will be replaced by higher quality *Circle Seals* balanced poppet solenoid valves

Surface Power and Interface, software:

Statement:

The system is currenty operated by a small Compac computer. This will not be used in the new system, prefering to use the more powerful IBM PC/AT that is used to control the D.M.T. Digital Televiewer. This will allow a reduction in the number of machines that must be supported at sea. This, being a faster machine, will also allow for graphical display of data in realtime. The packer control and acquisition software will need to be completely rewritten and an hardware interface built to utilize the new data format and electronic designs.

The surface power supply supplied with the system will probably not be used in the future. Instead, we will use the *Sorenson* 1.8KW supply that has already been purchased for another project.

Work Statement and Budget:

We plan to build and test one complete tool. If, after shipboard testing, the tool meets expectation, additional tools could be constructed at substantially reduced. We will require two engineers to complete this project in a reasonable time period. The period as planned is 9 - 12 months. One engineer will specialize in electronics, the other mechanical and hydraulic design. Most of the work will be done at Lamont with the exception plating, heat-treating, and some machining. Lamont has a complete and capable machine shop on campus.

In regards to electronics, some equipment will be needed for software development for the microprocessors. Since this equipment tends to be expensive and will only be needed temporarily, it will be rented rather than purchased.

The budget is prepared somewhat differently than in the usual proposal. The project requirement or base cost is the average between the projected minimum and maximum costs. Note that no overhead will be charged for individual components that make up the tool. Exception are spare parts and rentals.

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Wireline Packer Budget

Expendature:	Type:	Units(min.)	Units(max.)	Cost $(min.)	Cost$(max.)	Total Line(min.)	Total Line (max.)
Section#1(Node#1):FSK Data Transmission	Electronic	1	1	2000	3000	2000	3000
Section#1: Cablehead, Cable Tension, Centralizer	Mechanical	1	1	5000	6000	5000	6000
Section#2(Node#2): Valve/Pump Control	Electronics	1	1	1500	3000	1500	3000
Section#2(Node#2):HV power supply	Electronics	1	1	1000	1500	1000	1500
Section#2: Inflation control valves	Mechanical	4	5	1000	1200	4000	6000
Section#2:Chassis	Mechanical	1	1	1500	2000	1500	2000
Section#2:Pump (mostly scavenged)	Mechanical	1	1	1000	2000	1000	2000
Section#2: Crossovers/Tool Connections	Mechanical	1	1	4000	7000	4000	7000
Section#2:Pressure Case (HV/pump control)	Mechanical	1	1	2000	4000	2000	4000
Section#3(Node#3): Aux. Measurements	Not scheduled	0	0	0	0	0	0
Section#4(Node#4): Measurement Sonde	Electronics	1	1	2000	3000	2000	3000
Section#4: Flowmeter	Sensor	1	1	1000	2500	1000	2500
Section#4:Pressure	Sensor	2	2	1200	2400	2400	4800
Section#4:Fluid Conductivity	Sensor	1	1	500	1000	500	1000
Section#4:Temperature	Sensor	1	1	250	500	250	500
Section#4: Pressure case	Mechanical	1	1	1500	3000	1500	3000
Section#4:Crossovers/Tool Connections	Mechanical	1	1	2500	5000	2500	5000
Section#5(Node#5): Valve controls	Electronics	1	1	2000	3000	2000	3000
Section#5: Pressure cases	Mechanical	1	1	3000	6000	3000	6000
Section#5:Valves	Mechanical	8	8	500	1200	4000	9600
Section#5:Bottles	Mechanical	8	8	1000	1500	8000	12000
Section#5: Crossovers/Tool Connections	Mechanical	1	1	2500	5000	2500	5000
Section#6: 60" Packer elements	Mechanical	4	4	1500	2000	6000	8000
Section#6: Packer Mandrels	Mechanical	2	2	1000	1500	2000	3000
Section#6: Filter System	Mechanical	2	2	1000	3000	2000	6000
Misc Parts: Fittings/Tubing	Mechanical*	1	1	1500	3000	1500	3000
Misc Parts: Small hardware	Mechanical*	1	1	1000	1500	1000	1500
Misc Parts: Spare seals	Mechanical*	1	1	1000	1000	1000	1000
Development Equip.	Electronics*	1	1	4000	8000	4000	8000
	Equipment subtotal:					69150	120400
Equip. Overhead @ 42%						3150	5670
Electronics Engineer	Salary	9	12	3500	4500	31500	54000
	Fringe @27%	9	12	945	1215	8505	14580
Mechanical Engineer	Salary	9	12	3500	3500	31500	42000
	Fringe @27%	9	12	945	945	8505	11340
Salary subtotal						80010	121920
Salary Overhead @ 42%						33604	51206
Salary total						113614	173126
	Best Case/Worst case Tally					$185,914	$299,196

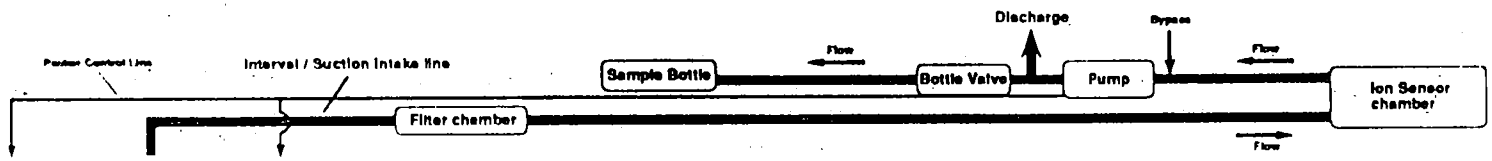
Project less Overhead	$195,740	plus/minus	$56,641
Overhead (42%):	$46,815	plus/minus	$10,061
Total w/Overhead:	$242,555	plus/minus	$66,702

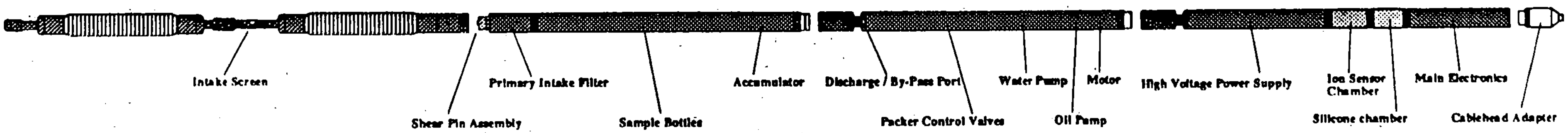
* denotes Overhead applies

Existing Wireline Packer Layout:

This figure illustrates the path of the sample fluid flow and the configuration of basic components in the existing system. The Sonde is approx. 45 feet overall, fluid path from Interval to Bottle is approx. 55 feet.

Fluid Paths





Straddle Packers:
This section consists of the upper and lower packers.

Sample Bottle Section:
This section contains the 4 sample bottles, and the accumulator for the pump/motor section. The lower pressure case contains the primary filter.

Pump / Motor Section:
This section contains the motor, Oil pump, hydraulically driven water pump, and the packer / sample bottle control valves.

HVPS and Main Electronics Section:
From top to bottom, this section is comprised of 4 pressure case. The upper case contains data acquisition and valve control electronics. The middle two cases contain the silicone oil filled sensor pressure compensator and the Ion sensor chamber, respectively

The lower pressure case contains the High Voltage power supply.

Figure #??

Not to Scale

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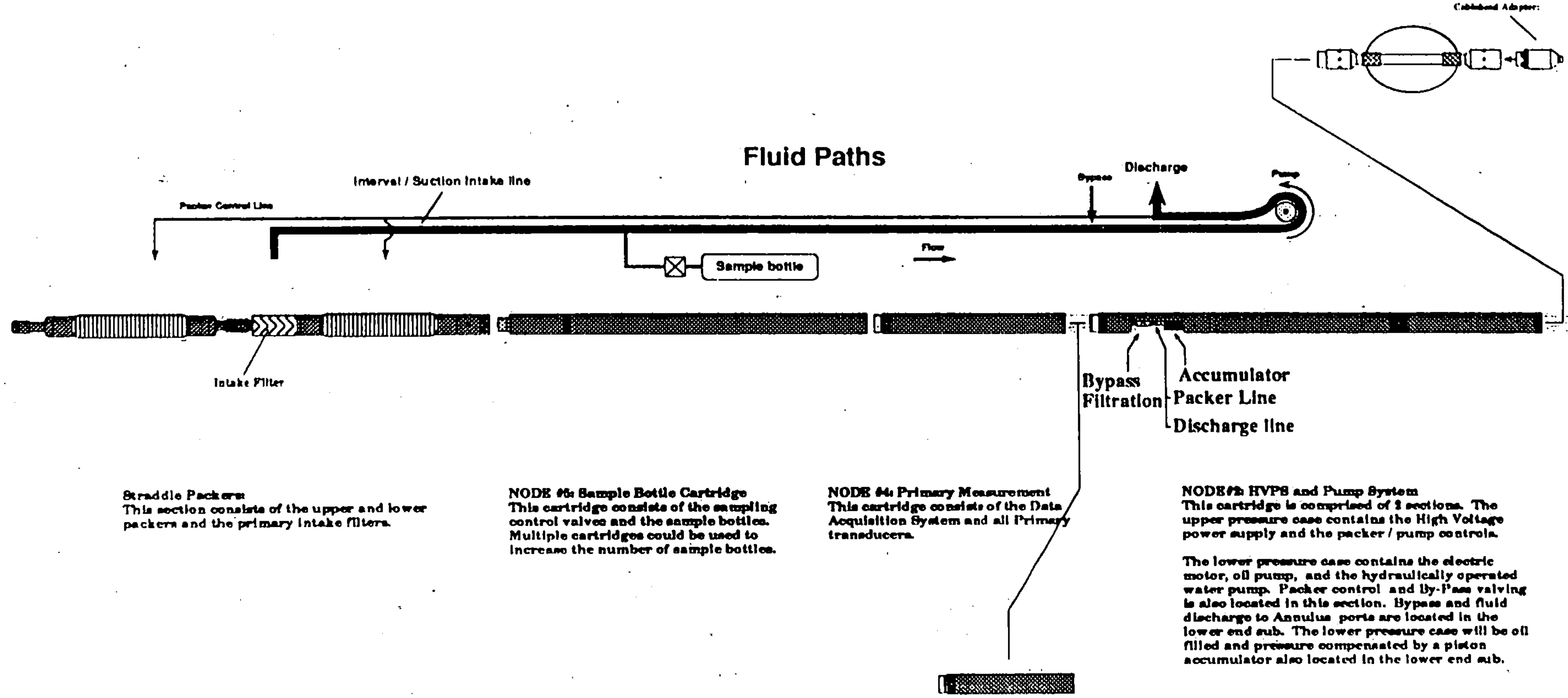
Restructured Wireline Packer layout:

This figure illustrates the path of the sample fluid flow and the new configuration of basic components. The design is optimized for minimum tubing length and fluid volume before the sample bottles, and minimum hydraulic and electrical interconnection between cartridges.

NODE #1: FSK Transmission / Centraliser
This cartridge consists of the FSK Transmission system and will include a head tension measurement. The bow spring centraliser will stabilise the sonde when the packers are set and the cable is slacked.



NODE#3: Auxiliary Measurement
This cartridge could consist of the fluid chemistry, fluid density, Differential Pressure Transducers, and/or other experiments.

Figure #??

Not to Scale

ANNEXURE II

Status of the Shipboard Computer System February 1991

Prepared by the ODP Technical Service Group

Status of Shipboard Data Integration

Status of Shipboard Data Integration

This document reviews recent developments in the shipboard computer systems. In addition special attention is given the those areas relating to the integration of core and log data.

1. Current Status of the Shipboard Computer System

1.1. VAX

1.1.1. New Hard Disks

Three 1.2 gigabyte hard disk drives have been sent to the ship. One drive is in use as a DATA disk, the second as a DATA backup disk and the third as a spare. SCSI bus technology was used resulting in a very cost-effective solution to the disk space problem we were experiencing.

1.1.2. Multinet Software Installed

In order to establish an easy and reliable data transfer path between the BRG computer systems and the shipboard VAX cluster, the Multinet TCP/IP networking package was installed on leg 134.

TCP/IP protocols are pervasive in ethernet-based networking and they allow a variety of hardware platforms to readily share network services. The shipboard VAX is now capable of transferring files to and from the BRG Masscomp, Macintosh and VAXstation 3200 computers. This link is also used to support the digital televiewer installed on leg 134.

1.1.3. BRG VAXstation 3200 Installed

After testing at ODP Headquarters, the BRG VAXstation 3200 was shipped to the Resolution and installed in the Downhole lab. The system is networked to the shipboard VAX system and is in use for FMS data processing on a routine basis.

1.2. PC Compatibles

The PC compatibles have been upgraded to accommodate the increased demand for processing power on board the ship. After a careful evaluation of available hardware and software, the following components have been purchased for installation onboard the ship.

1.2.1. 386 Motherboards

- Full 80386 CPU
- 25 Megahertz clock
- Four Megabytes RAM
- 80387 Math Co-processor
- Microsoft-compatible Bus Mice

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1.2.2. **VGA Monitors**

- 14" screen
- 512Kb video memory on board

1.2.3. **3.5" HD Floppies**

This floppy disk format will become the shipboard standard. Its use will allow the easy transfer of data between the Macintosh and PC compatible systems.

1.2.4. **MS Windows 3.0**

- Graphical User Interface
- Multitasking
- Virtual Memory
- Compatible with Existing Software
- Network Compatible with Shipboard Internet

1.3. **Macintosh**

1.3.1. **LaserWriters**

- LW IInt's upgraded to IIntx
- QMS printers replaced with IIntx printers (in progress)
- LaserWriters Memory Upgrade
  Memory upgrades to four megabytes minimum.

1.3.2. **Mac Memory**

- Eight Megabytes in Most Systems

1.3.3. **SE's Upgraded to SE30's**

This motherboard replacement will allow the Mac SE computers to utilize all capabilities of the the Mac Operating System version 7.x when it is released.

1.3.4. **Mac II MMU Upgrades**

This Memory Management Chip (MMU) will allow the Mac II computers to utilize all capabilities of the the Mac Operating System version 7.x when it is released.

1.3.5. **New Paleo Lab Macs**

New Macintosh computers will be installed in the shipboard Paleo lab for the purpose of collecting biostratigraphic data in a computer database. Installation is anticipated for early summer.

1.4. **Spreadsheet Selection in Progress**

Status of Shipboard Data Integration

The selection of a spreadsheet for use on the shipboard microcomputers is currently in progress. Wingz, from Informix and Excel from Microsoft are under consideration. Both candidates run equivalently on the Macintosh and PC compatibles and are able to share data files transparently.

The final selection will be made in the near future and licenses will be purchased for use throughout the labstack. A few licenses for other popular spreadsheets will be available for special situations.

2. **Current Status of Shipboard Data Acquisition**

2.1. **Physical Properties**

2.1.1. **Multi Sensor Track**

- Software Stabilized

The Multi Sensor Track software received a major upgrade during the Leg 134 portcall in Townsville, Australia. The system is completely functional at this time. Data from the system is uploaded automatically to the VAX where it is manually processed to add sub-bottom depths. The final MST data files reside on the file server where they are available to all shipboard systems.

- Natural Gamma Sensor

Plans are in progress to add a natural gamma sensor to the MST. This measurement will allow the CoreLab data to be more readilycorrelated with the downhole logging data.

2.1.2. **Index Properties**

- Spreadsheet User Interface

A Macintosh computer is installed in the Paleo lab and guidelines have been established by the ODP Database group for Physprops spreadsheet interfaces. The need for a spreadsheet interface for this program has been identified as a top priority by the ODP Computer Software Priorities Committee. The upgrade has been requested for Leg 136.

2.2. **Sedimentology**

2.2.1. **Computerized VCD**

A Macintosh-based VCD program will be installed on Leg 136.

2.2.2. **Digital Core Imaging System**

A prototype digital imaging system was installed on the Resolution on leg 133. Feedback from this shipboard trial is being used to develop the system further on shore.

2.3. **XRD/XRF**

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- **Macintosh Spreadsheet Templates**

  Excel Templates were prepared during the course of Leg 134 for use in analyzing XRF/XRD data. A Macintosh computer was installed in the lab for this purpose and the spreadsheets are currently in routine use.

- **Xray Data on the Fileserver**

  The xray spreadsheets and the ASCII files output from the spreadsheets are routinely uploaded to the VAX fileserver for access throughout the labstack.

2.4. Geochemistry

No changes made or anticipated in this area. ASCII data files from the Chem Lab datasets are automatically stored on the file server for access throughout the labstack.

2.5. Paleontology

- **CheckList**

  The version of CheckList developed for ODP is currently in final testing on shore and should be ready for installation on the ship in the near future.

- **Bug In**

  A customized version of the Bug In program developed for ODP is being prepared. A prototype of the program should be ready in late February for testing. Final installation is scheduled for early summer 1991.

3. Data Processing Software

3.1. KaleidaGraph and Grapher

The KaleidaGraph program (on the Macintosh) and Grapher (on the PC compatibles) are currently on use aboard the ship for the production of final publication quality plots.

3.2. DataDesk Professional

The need for data analysis tools beyond the scope of spreadsheet programs has been identified on board the ship. The term Exploratory Data Analysis (EDA) is often used to describe a suite of integrated analytical tools which allow large volumes of data to be viewed in powerful and intuitive ways.

EDA packages typically include graphics, statistics and database functions in a way that maintains strong linkages between the different data views and facilitates an intuitive investigation of large datasets.

The DataDesk Professional program has been installed on all shipboard Macintosh computers to provide this function. No equivalent program has been found for use on the PC compatible systems, however we continue to look and will evaluate candidates as they appear.

3.3. COREPAC Software Evaluated

The COREPAC software package was installed on the shipboard VAX system for evaluation. The overall feeling was that the program had some very attractive features but could not be recommended for purchase without being customized to meet our specific needs.

4. Progress on the Integration of Core and Log Data

4.1. Background

The JOI workshop on Shipboard Integration of Core and Log Data, held in August 1990, formalized the need to unify the logging and core laboratory datasets. A strawman strategy was proposed in the effort to stimulate further discussion on the subject and to begin laying the groundwork for a solution to this problem.

The following sections review the work accomplished towards this goal and highlight several areas that may present problems.

4.2. Leg 134 Experiment

The discussion which follows relys heavily on experience gained during the course of ODP leg 134. On this cruise an effort was made to push the limits of the hardware and software (and personnel) currently onboard the ship and see what was possible in the way of data integration at this time.

The experiment involved collecting and processing data from every source possible and combining the data into Summary Data Tables. These data files were stored on the fileserver for use throughout the labstack.

The data tables and figures resulting from this effort are in high demand for post-cruise analyses and the 134 scientific party felt the experiment was a success.

A View of the Shipboard Fileserver

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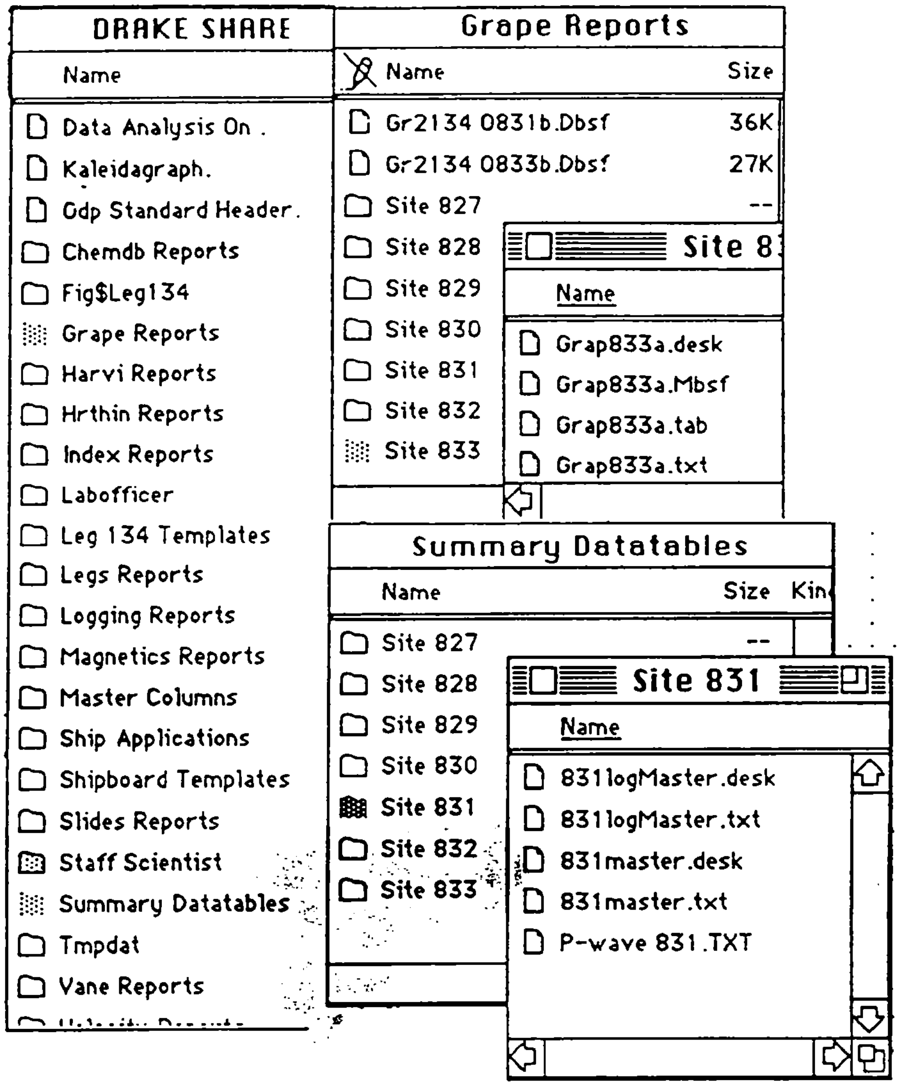
Status of Shipboard Data Integration



4.2.1. Lab-specific Datasets

The lab-specific datafiles were made available on the fileserver in two forms:

- Tab-delimited ASCII, which is readily uploaded to any spreadsheet or graphics package.

- DataDesk Professional binary files which are used for exploratory data analysis as described in the Data Desk section above.

These datafiles represented the "best efforts" of shipboard scientists to filter and clean the data from their labs. These datafiles comprised the individual components of the Summary Data Table described below. All the lab-specific data files contain sub-bottom depths calculated from the CORELOG dataset.

The unprocessed raw data were stored in the formal ODP datasets as usual for archiving by the ODP Database Group.

4.2.2. Logging Data

The downhole logging data was routinely received in ASCII format and stored on the fileserver for shipboard use. In one case the logging data was added to the Summary Data Table for cross plotting, however in most instances, the data was maintained separately due to the different depth references used by the two datasets.

4.2.3. Summary Data Tables

The lab-specific datasets were merged to form a Summary Data Table for each site. Summary Data Tables contained:

- A standard ODP Sample ID for each record

- A single reference depth for each record.

- Up to 60 columns of data from the various labs.

Both tab-delimited ASCII and DataDesk Professional versions of the Summary Data Tables were available on the fileserver.

Several characteristics of the Summary Data Tables should be noted:

- Data Collection Parameters Not Included

  In an effort to keep the Summary Data Tables to a manageable size, the parameters used when the data was collected was not included. These parameters were archived in the individual datasets and it was felt that their inclusion in the summary would be redundant.

- Not all collected values used

  In some cases where several data were collected from the same interval, a decision was made to include only the more interesting measurements in the summary. In the smear slides datasets for example, more than 30 components were entered in the descriptions, but only the most important five were included in the Summary Data Tables.

- Depth Shifting Used

  Due to the high resolution of the MST data (2.5cm) it was felt that the other datasets could be shifted to the nearest MST measurement with little loss of integrity. This approach was used on all the Summary Data Tables with a depth shifting window of 3cm.

  As better methods become available in the future, they can be easily incorporated in this process.

4.2.4. Master Hole Columns

At the request of the Co Chief scientists, a template was made which allowed the construction of a lithologic column for the current hole in near-real time. At the end of each shift, the column was updated with the current information and posted for comments. This approach foreshadows the anticipated use of the computerized VCD program and had two major benefits:

- Most of the important controversies about the hole became apparent as it was being drilled. Consequently, the discussion and analysis of these issues began much earlier and was pretty well settled by the time the hole was completed.

- The completed Master Columns were enhanced with plots from the Summary Data Tables and formed the backbone figure for the hole summary reports.

4.2.5. Problems and Recommendations

4.2.5.1. Shipboard System Manager Time Constraints

A conscious decision was made prior to Leg 134 that this experiment would be given a very high priority and that, if necessary, routine system manager functions would be delayed or sacrificed in order to achieve it's goals.

In practice an average of two hours per day were spent on creating, maintaining and analyzing the summary data tables. The Shipboard System Managers routinely work a 13 - 15 hour day during a cruise and the added burden of data integration cannot be readily accommodated under the current staffing levels.

If the integration of shipboard data is to become a routine function we request that DMP recommend, to JOI, the addition of a second seagoing Computer System Manager for each cruise.

4.2.5.2. Data Processing Utilities Needed

Several software tools are needed to facilitate the process of integrating the core data. These vary from simple tabulating programs like that provided by Roy Wilkens to more sophisticated filters and smoothing routines.

Producing these tools will be difficult under the current staffing levels. Therefore we request that an additional person-year be provided to the shipboard computer group for this purpose.

4.2.5.3. Shipboard Scientist Time Constraints

Use of the master data files by shipboard scientists was limited by the time they had available after performing their routine shipboard assignments. Detailed analysis of the shipboard data was generally undertaken by scientists after their regular working hours.

The suggestions forwarded by DHP with regards to a core-log correlation specialist should be very helpful in this regard.

4.2.5.4. Microcomputer Processing Power

Our efforts at data integration during leg 134 were focused on the Macintosh because it has the most complete set of data processing tools. In the future we can expect this type of work to take place equally on the Mac and PC compatible systems.

The Mac IIx used during Leg 134 should be considered a minimum configuration for this purpose. At times it took over 10 minutes for a large ASCII datafile to be uploaded into Excel. This type of data processing is repetitive in character and small processing delays quickly add up.

Due to the extremely large size of the datasets involved, our recommendation is that several specialized data processing workstations be purchased specifically for this purpose. These machines should have large screens, very fast processors, large hard disks and abundant memory.

4.2.6. Fixed Reference Depth

This section addresses the need for a central reference depth that spans the many different data types collected on the ship. There are three components to this problem:

- Establishing a consistent depth across the core data

- Establishing a consistent depth across the logging data

- Correlating the two into a final depth dataset for the site

To date we have only addressed the first aspect of the problem, setting a consistent depth standard for the core lab datasets.

4.2.6.1. MultiSensor Track as a Reference Depth for Core Data

The Multi Sensor Track provides a convenient depth reference due to its consistent use on most cored materials, and the fine granularity of its measurements (typically, a measurement is taken every 2.5 cm).

On leg 134 we took advantage of this convenient data series for use as a reference depth for all the core data. Data from other disciplines were shifted to the nearest MST sample depth as they were merged into the Summary Data Tables described above.

This approach has the benefit of simplifying the eventual correlation of core and log data depths while providing a very useful dataset for use today. We recommend that the MST be adopted as the standard reference depth for corelab datasets.

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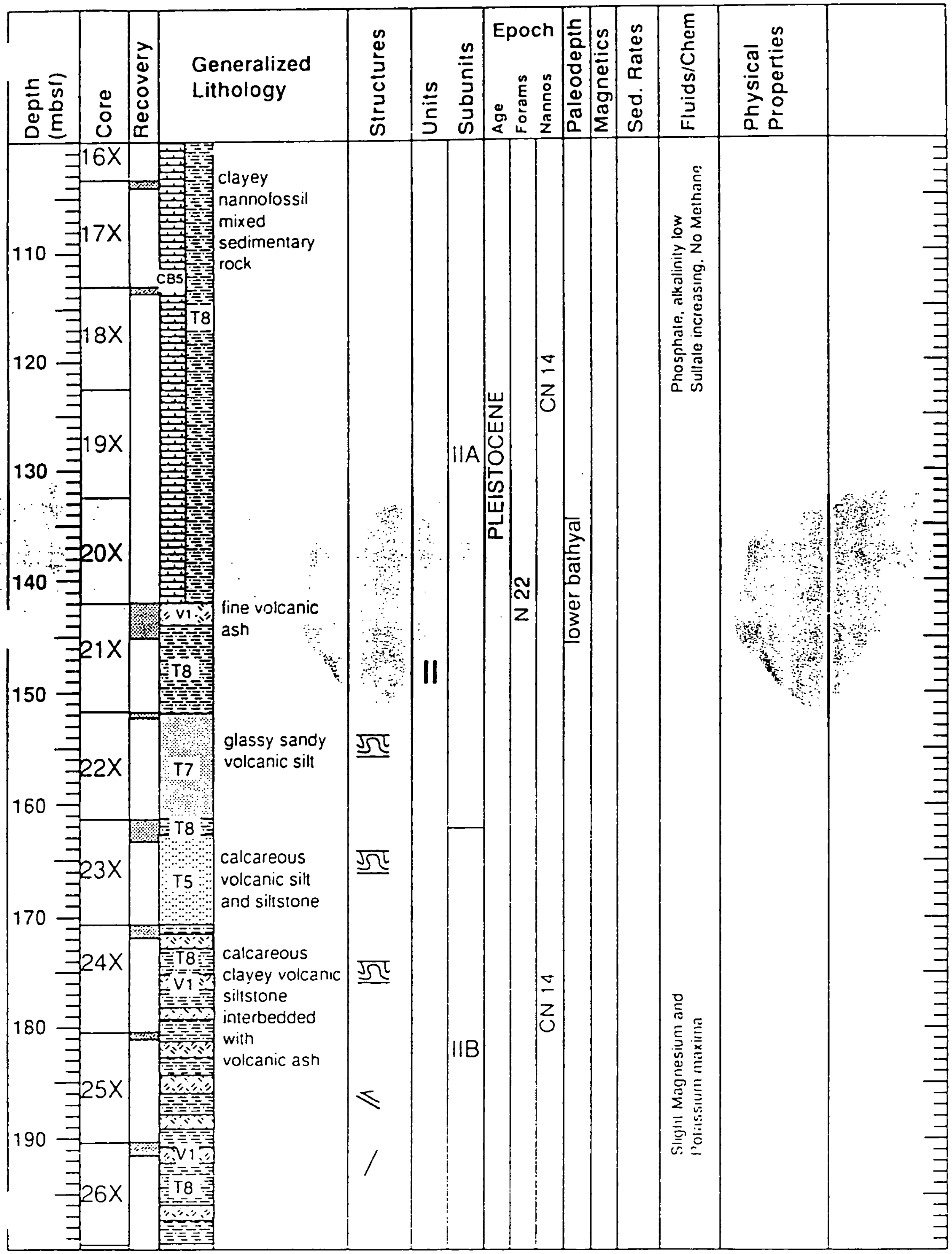
Master Column Leg: 134 Site: 833 Hole: A



Last Modified on Date Time

Data Processing Worksheet

Site: Finished:

	*.MBSF	*.TAB	*.TXT(Local)	*.TMP(Sum. Rpts)	*Master.TXT	*Master.DESK
MST-Susc	Wendy	Perrick	Perrick	Perrick	Bill	Bill
MST-Grape	Wendy	Stefan	Stefan	Stefan	Bill	Bill
MST-Pwave	Wendy	Maria	Maria	Maria	Bill	Bill
Slides-Texture	Bill	Bill	Bill	Bill	Bill	Bill
Slides-Compon	Matt	Matt	Matt	Matt	Bill	Bill
Desc. Velocity	Maria	Maria	Maria	Maria	Bill	Bill
Vane-Shear Str.	Maria	Maria	Maria	Maria	Bill	Bill
Index Props	Maria	Maria	Maria	Maria	Bill	Bill
Thermcon	Mike	Mike	Mike	Mike	Bill	Bill
Organic Chem	Mark	Mark	Mark	Mark	Bill	Bill
Inorg. Chem	Mark	Mark	Mark	Mark	Bill	Bill
Logging	Mike	Mike	Mike	Mike	Bill	Bill

Data File Structures

*.MBSF	ODP Standard format with sub-bottom depths added. Spaces delimit columns.
*.TAB	*.MBSF file with space delimiters changed to TAB chars using Evolutions or TAB 1.3
*.TMP	*.TAB file with extraneous columns removed, only MBSF and DATA columns remain. *.TMP begins with a blank line and has text column headers in the second line
*Master.TXT	Tabbed ASCII file combining multiple datasets for general distribution
*Master.DESK	DataDesk Professional data file combining multiple datasets for general distribution

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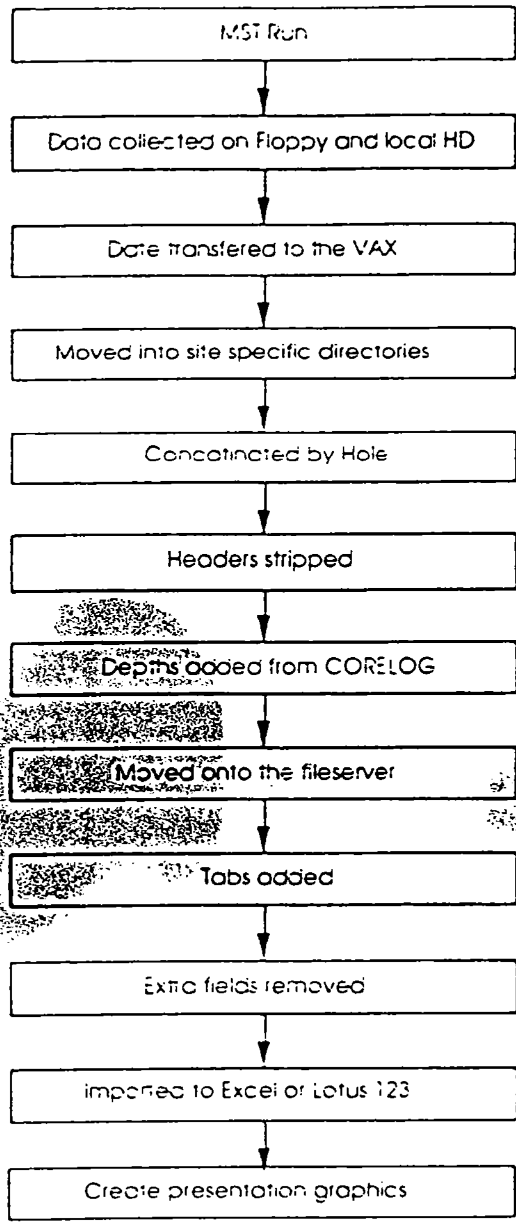
- Overview of data processing on the Resolution
  - We've slowly but steadily inched forward in the last six years
    - The Hardware has improved
    - The Software has improved
    - Networking has become feasible
  - A vision for the near future
    - Ship-wide integrated data system
      - DataDesk visual factor analysis demo
    - Distributed image processing
    - Natural Gamma for "true" sub-bottom depths
    - Scientists will have more control over the publications
- Where we're at now
  - The Mac's are ready, the PC's are almost there
  - The VAX is stable for the near future
  - Distributed print services are on the horizon
  - The network is ready
  - The Integrated Data system needs some tools built
  - The users aren't using what is available effectively
  - The System Manager's are barely keeping up
    - Started with two VAX systems now we have five
    - Started with 15 applications, now over 50
    - Started with 37 Pro350's, now over 70 Pro's, PC's and Macs
    - Started with simple serial communications, now InterNetwork

How GRAPE data is processed



Adding another dataset

1. Process new data to Depths stage
2. Moved onto the fileserver
3. Tabs added
4. Extra fields removed
5. Merged with "Base" dataset
6. Imported to Excel or Lotus 123
7. Create presentation graphics

Establishing real-world sub-bottom depths

1. Collect and process corelab data
2. Collect and process downhole logging data
3. Correlate the two datasets
4. Revise the Integrated Dataset depths
5. Revise the CORELOG
6. Advertise the changes

- A demonstration Exploratory Data Analysis (EDA)
- How we get there from here

The items listed below are things I feel are necessary to implement the integrated data system described above in a reasonable time frame.

- We need about one man-year of programming effort

  This effort will create the small to medium sized tools needed to make the system run smoothly. An example of work to be done would be a complete and polished version of the Merge and Tabulate utilities used above. These tools would only have to be created once since the bulk of the work is accomplished using commercial applications.

- We need to sail two System Managers on every leg

  Sailing two System Managers would provide complete support for the integrated data system.

  - Current System Manager functions
    - VAX System Management (four systems)
    - VAX user support
    - Macintosh and PC system management
    - Macintosh and PC user support
    - Network administrator
    - Software maintenance (eleven systems)
    - Lamont VAX system management
    - Hardware troubleshooting and maintenance for all systems
  - Proposed additional responsibilities
    - Round the clock coverage
    - Integrated Data System data entry
    - Training material development

- We need to educate the Scientific Community about this resource
  - Precruise workshops

- Published technical notes
- Hands on experience on ship and at ODP Headquarters
- Formal classes on the ship at the beginning of each cruise

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ANNEXURE III

FY1992 DOWNHOLE MEASUREMENTS PROSPECTUS
Version 3 of CEPAC Logging Prospectus
1/14/91

Table of Contents

Introduction

This CEPAC downhole measurements prospectus has several purposes:

1) facilitate an early integration of logging into CEPAC program plans;

2) provide information to JOIDES panels (and ultimately cochiefs) on the scientific aims of logging for individual programs, including the chances of successful achievement of the aims;

3) increase the opportunity for all JOIDES panels (not just DMP and PCOM) to contribute to the design of appropriate downhole measurements programs;

4) assist in an early identification of technical needs and their priorities; and

5) evaluate the impact of drilling technology (particularly diamond coring system) on the scientific accomplishments of downhole measurements.

The document is expected to evolve. Version 1 (4/29/89) included all potential CEPAC programs but represented only the perspective of one person: Chief Scientist of the ODP Wireline Logging subcontractor. DMP used Version 1 as a strawman in its 5/89 meeting, at which initial DMP recommendations for FY90 and FY91 CEPAC programs were established. Version 2 (11/10/89) of this prospectus was revised to include only the first year of CEPAC and to reflect DMP recommendations, DMP evaluations of the scientific contributions of recommended tools, and logging times. Version 2 was distributed to the Planning Committee and panel chairmen at the 11/89 PCOM meeting. **This third version covers only FY92 programs, of which many but not all have been considered previously by DMP.** Further evolution of the prospectus will certainly result from panel feedback and from the transformation of programs into legs.

Most of the scientific objectives listed in this prospectus are based on the specific objectives mentioned for each program in the CEPAC third prospectus. However, broader objectives should not be neglected. DMP has emphasized the roles of cores and standard logs as an archival heritage for future investigations, leading to scientific accomplishments beyond those of the ODP volumes. Further, some panel objectives such as stress can be better addressed by making measurements at "targets of opportunity" than by drilling many sites specifically for stress measurements.

Projected logging accomplishments are dependent on the tools assumed to be available. We assume that all of the tools currently used in ODP will be available for FY1992:

1) "Standard logs" (two tool strings): waveform sonic, spectral gamma ray, resistivity, density, neutron porosity, caliper and temperature (low T) and spectral gamma ray, aluminum clay tool, gamma spectrometry, and temperature.
2) Formation MicroScanner and general purpose inclinometer (hole deviation, tool acceleration, magnetometer), listed separately from the standard logs below but recently classified as a standard log by PCOM;
3) Dual laterolog;
4) Vertical seismic profile tool (1-component; individual investigators <u>may</u> bring a 3-component tool);
5) Digital borehole televiewer;
6) Multichannel sonic.
7) Magnetometer/susceptometer;
8) Barnes water sampler/temperature/pressure;

Four additional tools have had little or no prior ODP use and may not be fully operational for FY92:

1) Wireline packer;
2) Pressure core barrel;
2) Geoprops probe; and
3) Lateral stress tool.

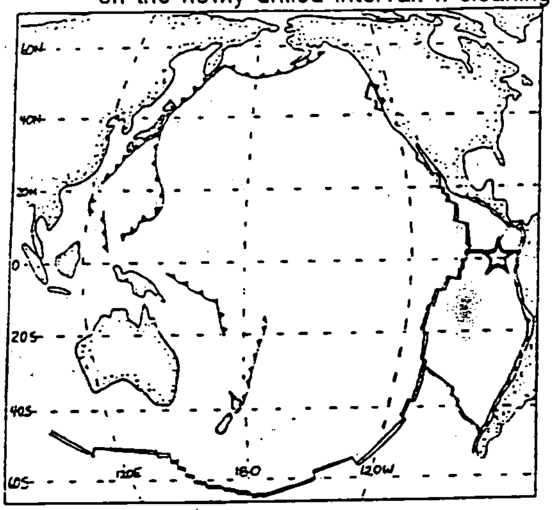
We include several other tools in leg objectives and logging tool objectives sections, accompanied by the caveat that they are unlikely to be available.

Several CEPAC programs anticipate hot holes. We generally assume that the holes can be cooled enough by circulating to permit running the tools listed above; exceptions are flagged in the text. The East Pacific Rise program is likely to use a diamond coring system for improved penetration in fractured basalt. A 4" DCS hole would exclude all of the tools above. Instead, we assume that the following slimhole tools will be available: temperature, fluid sampler, sonic (no waveforms), gamma ray, density, neutron, and resistivity. This assumption is probably too optimistic; current dewaring plans include resistivity, sonic, and gamma ray, at most. Because of the very different logging accomplishments for 4" and for larger holes, we list separately the logging tool objectives for these two hole environments.

Penetration of Layer 3 at 504B

Thanks to the drilling and logging efforts of four DSDP legs and one ODP leg, Hole 504B is the deepest and best-studied penetration into oceanic crust. The 1288 m of penetrated basement provide an unmatched ground truth for seismic models of the structure and evolution of the oceanic crust. The hole now bottoms in sheeted dikes of Layer 2C, and a Leg 111 VSP suggests that the gabbros of Layer 3 may only be 100-450 m deeper. This program seeks to deepen 504B into the gabbros and to study the physical, hydrologic, seismic, and magnetic nature of Layer 3 and the Layer 2C/3 transition.

Leg 111 downhole measurements at 504B were cited by LITHP as one of the most important ODP accomplishments to date. Leg 137 will log temperature, sample fluids, and test flowmeter permeability logging, then attempt to remove junk from the bottom of the hole. Assuming that hole cleaning is successful, Leg 140 will deepen and log the hole. Deepening to reach gabbros (perhaps 100-450 m deeper based on VSP reflectors) is hoped for. Most downhole measurements would focus on the newly drilled interval. If cleaning is unsuccessful, Leg 140 will drill Hess Deep instead.



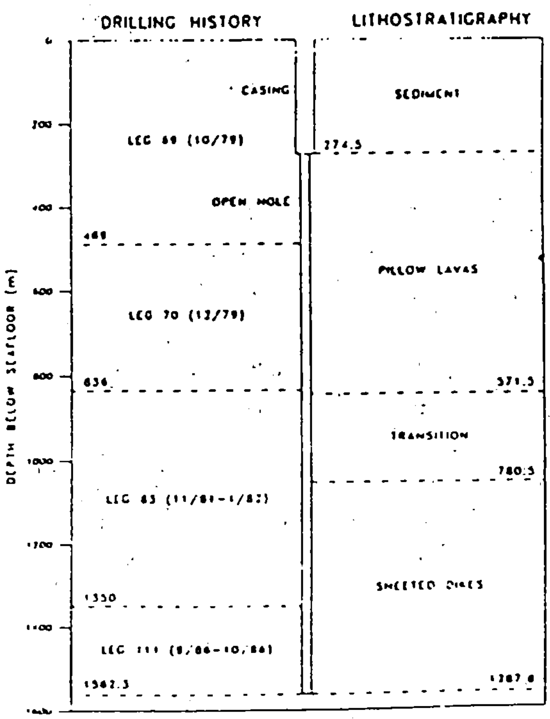


TABLE 1. Logs and experiments run in Hole 504B. In many cases the logging tools used by ODP are superior to those used during DSDP, so the logs and experiments are grouped into runsduring DSDP Legs 69, 70, 83, and 92, and those run during ODP Leg 111.

Log/Experiment	Interval logged (mbsf)
A. DSDP - Legs 69, 70, 83, and 92	
Caliper log	277-1287.5
Neutron log	277-1287.5
Density log	277-1287.5
Sonic logs	
P, S, full waveform	277-1287.5
Multi-channel sonic	277-426
Borehole televiewer	277-1287.5
Oblique seismic experiment	
geophone depths	316.5, 546.5, 726.5, 941.5
Electrical resistivity	
SFL	277-1287.5
Large-scale experiment	
45, 91, 182 m array	277-836
10, 20, 40, 80 m array	277-1287.5
Temperature (11 separate times)	0-1287.5
Borehole fluid samples	numerous, with varying degrees of contamination
Packer - permeability intervals	316.5-489, 473.5-489, 836.5-1287.5
Magnetometer (Russian)	277-489
B. ODP - Leg 111	
Temperature log (French)	0-1250
Borehole water samples	
Schlumberger RFT	466, 766, 1236
Kuster (9 of 10 failed)	631
Neutron activation (ACT/GST)	277-1535
Lithodensity log	277-1535
Multi-channel sonic	277-1535
VSP (geophone clamped every 10 m)	164-1535
Borehole televiewer (USGS)	1176-1531
Dual Laterolog resistivity	277-1535
Magnetometer (Schlumberger)	277-1535
Packer - permeability intervals	936-1406.5, 1236-1547.5

Site I.D.	Water Depth	Penetration Sed.	Bsmt.	
504-B	3460	275	1400-1750	1288 m basement already cored and logged

PREVIOUS PLANS FOR LOGGING:

On 5/89, DMP developed the plan listed below. Since then, the only changes have been in the subjects raised by the final three paragraphs: flowmeter permeability is scheduled for Leg 137 and hole sealing technology is under development.

Lower Crust - Penetration of Layer 3 at 504B

Scientific Objectives

Physical, chemical, seismic, magnetic and hydrological nature of Oceanic Layer 3.

Dyke to gabbro transition

Relevant DMP Thematic Thrusts

Crustal composition and structure
Hydrogeology

Logging Programme (assuming 5" hole or greater)

Entire hole (pre-existing and new sections):

Geochemical string
FMS
Wireline packer
Temperature tool
Magnetometer/susceptibility (high sensitivity tool)

New hole only:

Seismic stratigraphic string
Packer
BHTV (200 m of overlap into pre-existing hole)
Dual laterolog

Good temperature logs and water samples are needed before the junk is cleared from 504B.

Estimated bottom hole temperature in pre-existing hole is 160°C: at base of new hole (2000 m) it will be about 190°C. This raises a question concerning the temperature range of the above tools.

This logging programme assumes at least a 5-inch hole. It would be regrettable if 504B had to be re-accessed with a primitive logging suite as would be necessitated if the DCS were to be used for hole deepening.

Permeability can be evaluated through flowmeter injection. A spinner flowmeter would have to be included in the logging programme. Before making a final decision, Panel asked if a typical data scenario could be prepared with indications of ranges of permeability and corresponding accuracies and precisions.

[ACTION : MORIN]

The question was raised of sealing the hole after drilling to minimize downflow and thereby to recover subsequently better fluids and temperature. For the same reason it is desirable to isolate the bottom of the hole. The feasibility of this proposal should be established.

[ACTION : FISHER]

DMP Consensus

Long-term sealing should be effected after further drilling at 504B with subsequent in-hole experiments directed at temperature and fluid flow.

LEG OBJECTIVES:

1. Geophysical properties of Layer 2C/3 transition and upper Layer 3. The prime objective of this leg is "to provide ground truth for seismic models of the structure and evolution of the oceanic crust". Layer 3 is assumed to be gabbro but is defined and regionally mapped on the basis of velocity. Velocity, density, and porosity of both the Layer 2C/3 transition and of Layer 3 need to be measured and compared to the simple seismic models. Standard logs will suffice in these massive units; multichannel sonic or a VSP does not appear to be necessary. Chance of success: excellent.

2. Geologic controls on the geophysical properties of Layer 2C/3 transition and upper Layer 3. This objective requires comparison of the continuous geophysical logs with similarly continuous

"geologic" records: classification of dikes, sills (if any), intrusive bodies, fossil magma chambers, etc; petrologic character of the units; fracture pattern; and hydrothermal alteration.

a) Discrimination of dikes, sills, intrusive bodies, fossil magma chambers, etc. Standard logs can discriminate unit boundaries and identify some types of units on the basis of geochemical signature. However, FMS and/or televiewer will be needed to classify the remainder of units. For example, the strike and dip of dikes or sills can be determined by either the FMS or BHTV; ideally, both would be used because their measurements (resistivity and impedance) are sufficiently different that each may pick up some features missed by the other.

b. Geochemistry and modal mineralogy of units. Major element geochemistry from standard logs can provide a quantitative picture of fractionation, alteration, and -if present- changing magma sources. Because the geochemical logs sample both fresh and altered rock, alteration may partially prevent log detection of some primary geochemical differences. However, the advantage of this representative and quantitative sampling of alteration is that one can potentially estimate the total geochemical fluxes into and out of basement, caused by hydrothermal alteration. Modal mineralogy can be calculated from the geochemical logs.

Some petrologic sources of geochemical variations, such as crystal settling, will also have important effects on other standard logs (e.g. velocity). Even though geochemical logs were obtained on Leg 111, logging of the entire hole is desirable on this leg, for two reasons. First, the new boron-sleeved gamma spectroscopy tool is more accurate than the tool used on Legs 101-125. Second, Hole 504B is the only hole for which the old and new tools will definitely have been used, enabling a comparison and possibly correction of old data.

c) Fracturing and faulting in Layers 2 and 3. Standard logs provide only a qualitative record of fracture intensity. Dual laterolog sees a deeper, more representative fracture porosity and provides a qualitative indicator of the relative proportions of subhorizontal and subvertical fractures. Borehole televiewer and FMS image individual fractures (their azimuth, aperture, and whether they are filled or open). Hole 504B has already intersected one possible fault and deeper penetration may encounter additional faults. Faults should be a particular focus of high-resolution imaging and packer work, because of their tectonic implication and disproportionate influence on hydrothermal circulation. Televiewer imaging of the possible fault has already been obtained; FMS logging is fast enough to log the old penetration including the fault, at only a minor increment of time beyond that needed to log the new penetration.

3. Hydrothermal processes in the oceanic crust. The deepened Hole 504B will warrant the same multifaceted approach to hydrothermal circulation utilized on Leg 111: fracturing and faulting (already discussed); permeability; fluid flow; fluid sampling; and hydrothermal alteration.

a) Permeability. In low-permeability formations such as those anticipated, permeability can be measured with the straddle packer, single drillstem packer, or possibly injection flowmeter. Packer work will focus on the new hole but may also target shallower problem areas.

For example, straddle packing across the hypothesized fault would indicate how much, if any, of the deep permeability is localized in this zone.

b) Active fluid flow. Temperature logs can be obtained on most tool strings, but the expected temperatures of up to 200°C indicate that dedicated runs of a high-temperature tool are needed. Temperature logs indicate the locations of zones of present fluid flow and provide semiquantitative measures of flow rate. When combined with a thermal conductivity log from log-based mineralogy and porosity, the ability of temperature logs to detect subtle fluid flow is substantially improved. If several temperature logs are available, an equilibrium thermal gradient can be calculated, yielding heat flow and an indication of broad-scale conductive vs. convective heat transport. However, drilling conditions are likely to require slow long-term cooling of the hole to prevent formation damage. It is therefore uncertain whether even repeated temperature runs will permit accurate extrapolation of equilibrium temperatures. Pore pressure can be measured with the wireline packer. Flowmeter experiments such as those on Leg 111 may be useful, more from the standpoint of between-leg changes in flow rates than from the expectation that the hole deepening contributes to observed flow.

c) Fluid sampling. The lack of reliable fluid sampling is possibly the major shortcoming of previous work at 504B. Many attempts failed to obtain any fluids, and virtually all samples were of fluids in the drillhole rather than of uncontaminated and well-located formation fluid. Interstitial water sampling of course was not possible. An intensive program of wireline-packer fluid sampling throughout Hole 504B appears to be needed.

d) Hydrothermal alteration. Abundance of alteration minerals can be determined by inversion of standard logs. Core measurements of cation exchange capacity, coupled with a resistivity log and log estimates of bound vs. free water, appear to be more reliable than straight geochemical log inversion. Log-based estimation of alteration mineral abundance is more representative than core studies of alteration and is therefore essential to understanding the permeability distribution.

4. Magnetic properties of oceanic crust. Debates continue concerning the relative contributions of different crustal layers to marine magnetic anomalies, primarily because samples from ophiolites and dredges are not representative. Hole 504B is the best place to test crustal magnetization models because of its very deep penetration. The quality of previous magnetometer logs at 504B is far below present capabilities. A magnetometer/susceptometer is needed, with a built-in gyroscope for determination of declination. Because the interval 900-1500 mbsf is weakly magnetic, a higher sensitivity than the Leg 111 Schlumberger magnetometer is needed to test the Leg 111 interpretation of tilting associated with the penetrated fault.

5. Comparison of Hole 504B and Site 735. Assuming that Hole 504B reaches gabbros, it will be important to compare and contrast in situ measurements of gabbros at the two sites. Unlike the normal crustal section at 504B, Site 735 has apparently been tectonically slivered, so that

gabbros outcrop, an unknown portion of upper Layer 3 is missing, and the degree of fracturing and hydrothermal alteration is atypical. The types of downhole measurements already obtained at 504B and 735 are similar to those anticipated for 504B deepening, so this comparison will be a natural outgrowth of the new 504B interpretation.

LOGGING TOOL OBJECTIVES:

1. Standard logs: geophysical properties (V_p, V_s, density) of Layer 2C/3 transition and upper Layer 3; controls on geophysical properties (composition, fracture porosity, alteration); delineation of volcanic units (sills, dikes, etc.); geochemistry of units, with at least partial separation of fractionation, alteration, and magma source effects; geochemical fluxes into and out of oceanic crust; modal mineralogy; qualitative intensity of fracturing; thermal conductivity; abundance of alteration minerals; comparison to geophysical and geochemical properties of Site 735.

2. FMS and/or televiewer: refined delineation of volcanic units; quantitative fracture density, azimuth and aperture, and whether fractures are open or filled with secondary minerals; strike and dip of dikes; fault imaging and detection of differential tilting across faults; style and geometry of large-scale porosity. Because the televiewer provides a 360° image, it will be generally superior to the FMS for these objectives. However, FMS will probably be much more sensitive to variations in alteration and may detect some features missed by televiewer. High priority for both; televiewer in new hole, FMS in entire hole.

3. Wireline packer or other fluid sampler: fluid samples for hydrothermal alteration studies. High priority throughout the hole; wireline packer provides the only in situ fluid-sampling capability in this environment. Technical problems are anticipated in the deeper portion of the hole: long pumping times when permeability is low; no fluid samples obtained when permeability is very low; and possibly temperatures too high for the packer and electronics. DMP is expected to decide in 2/91 whether or not to recommend further development of the wireline packer.

4. Packer: permeability (>10 m scale), for hydrothermal processes objective. High priority, for a few measurements in both old and new portions of hole.

5. Temperature tool (high-temperature): identification of zones with active fluid flow; heat flow. Temperatures will be too high for the L-DGO combinable temperature tool. At least three logging runs of this tool may be needed. A major circulation program will probably be run to cool the hole for drilling and logging, possibly making it impossible to determine equilibrium thermal gradient; thus only the zones with very active fluid flow will be identifiable. High priority.

6. Magnetometer/susceptometer: magnetic properties of oceanic crust (especially Layer 3), including effect of alteration; flow delineation. High priority?

7. Dual laterolog: resistivity of massive units, for fracture porosity of the lowest-porosity zones; relative proportions of subhorizontal to subvertical fractures. High priority; conventional resistivity logs will probably not be reliable because of anticipated very high resistivities.

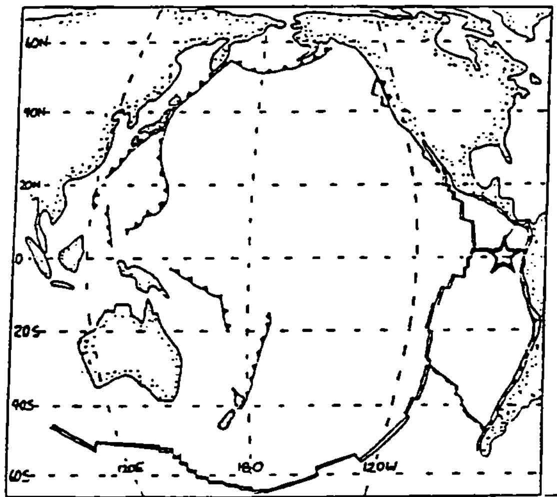
NEED FOR NEW LOGGING TECHNOLOGIES :

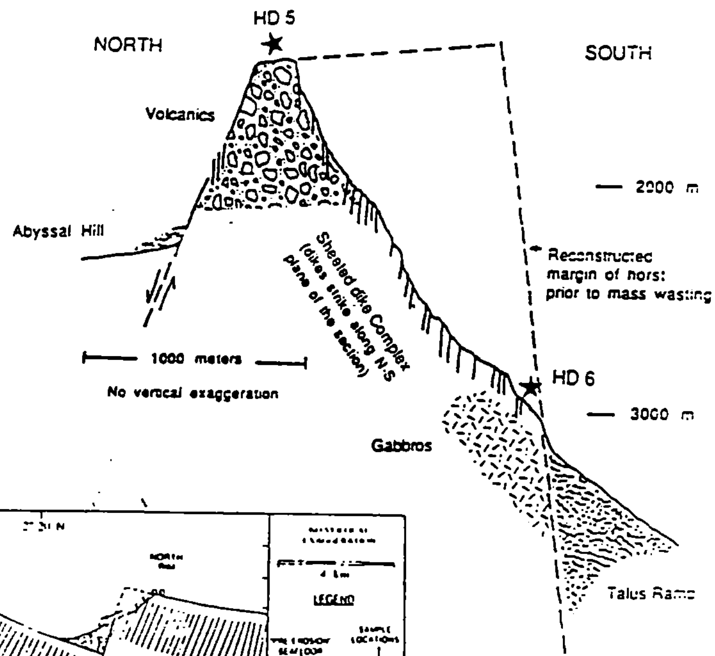
Minor hole cooling for standard tools. Temperature tool reliable to 200°C.

Hess Deep

This program seeks to study the deepest portion of oceanic crust and the contact between lower crust and Moho, by skipping the upper crust. In Hess Deep, pervasive normal faulting exposes virtually all portions of the oceanic crust; pogo drilling can sample any desired portion of the crust with a relatively shallow-penetration hole. The first hole would begin at a crustal layer deeper than the bottom of 504B and possibly penetrate Moho. Objectives are to study the physical, hydrologic, seismic, and magnetic nature of Layer 3 and the Moho transition. Standard rotary drilling will be used.

Leg 111 downhole measurements at 504B were cited by LITHP as one of the most important ODP accomplishments to date. Similar success can be anticipated for the deeper crustal section at Hess Deep. A multileg program is anticipated, but only one leg is scheduled: Leg 140 if 504B cleanout is unsuccessful, otherwise Leg 147. Either HD-1 or HD-2 would be drilled on this first leg; penetration is very uncertain.





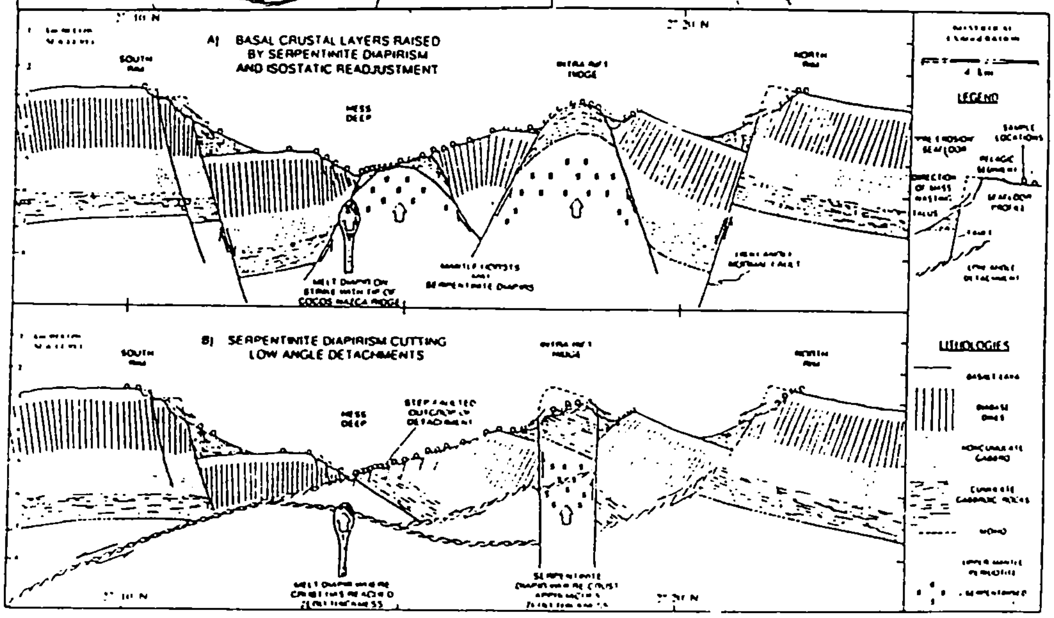


Figure 1. Interpretive cross sections depicting two models for the surficial geology and topography of the Hess Deep rift valley. Model A implies that the basal crustal layers have been raised by serpentinite diapirism and isostatic readjustment. Model B invokes low-angle detachments with only restricted diapirism. Small open circles shown on the surface represent places where samples were taken. The models are drawn with no vertical exaggeration (Francheteau et al., in press).

Site	Water	Penetration	
I.D.	Depth	Sed.	Bsmt.
HD-1	4500	--	1000 R
HD-2	5000	--	1000 R

PREVIOUS PLANS FOR LOGGING:

Never considered in detail by DMP, but 10/90 DMP meeting said probably similar to 504B.

LEG OBJECTIVES:

1. Geophysical properties of Layer 3 and Moho. Seismic models of variations in thickness of the oceanic crust need to be tested, through in situ measurements of velocity, density, and porosity. Standard logs will suffice in these massive units; multichannel sonic or a VSP does not appear to be necessary. Chance of success: excellent.

2. Geologic controls on the geophysical properties of lower crust and Moho transition. This objective requires comparison of the continuous geophysical logs with similarly continuous "geologic" records: classification of dikes (if any), sills (if any), intrusive bodies, cumulates, fossil magma chambers, etc; petrologic character of the units; fracture pattern; and hydrothermal alteration.

a) Discrimination of dikes, sills, intrusive bodies, cumulates, fossil magma chambers, etc. Standard logs can discriminate unit boundaries and identify some types of units on the basis of geochemical signature. However, FMS and/or televiewer will be needed to classify the remainder of units. For example, the strike and dip of dikes or sills can be determined by either the FMS or BHTV; ideally, both would be used because their measurements (resistivity and impedance) are sufficiently different that each may pick up some features missed by the other.

b. Geochemistry and modal mineralogy of units. Major element geochemistry from standard logs can provide a quantitative picture of fractionation, alteration, and -if present- changing magma sources. Because the geochemical logs sample both fresh and altered rock, alteration may partially prevent log detection of some primary geochemical differences. Modal mineralogy can be calculated from the geochemical logs. Some petrologic sources of geochemical variations, such as crystal settling, will also have important effects on other standard logs (e.g. velocity).

c) Fracturing and faulting. Standard logs provide only a qualitative record of fracture intensity. Dual laterolog sees a deeper, more representative fracture porosity and provides a qualitative indicator of the relative proportions of subhorizontal and subvertical fractures. Borehole televiewer and FMS image individual fractures (their azimuth, aperture, and whether they are filled or open).

3. Hydrothermal processes in the deep oceanic crust. This objective is a very high priority

at 504B and EPR, but it may not be important at Hess Deep, both because of limited hydrothermal circulation *in situ* in lower crust and because the sections exposed here have atypical hydrothermal circulation. If this objective is worth addressing, one would use the same multifaceted approach utilized on Leg 111: fracturing and faulting (already discussed); permeability; fluid flow; fluid sampling; and hydrothermal alteration.

4. Magnetic properties of lower oceanic crust. Debates continue concerning the relative contributions of different crustal layers to marine magnetic anomalies, primarily because samples from ophiolites and dredges are not representative. Based on Leg 118 and dredges, gabbros can be highly magnetic; additional representative sections are needed.

LOGGING TOOL OBJECTIVES:

1. Standard logs: geophysical properties (V_p, V_s, density) of Layer 3 and Moho; controls on geophysical properties (composition, fracture porosity, alteration); delineation of units (sills, dikes, etc.); geochemistry of units, with at least partial separation of fractionation, alteration, and magma source effects; modal mineralogy; qualitative intensity of fracturing; thermal conductivity; abundance of alteration minerals.

2. FMS and/or televiewer: refined delineation of volcanic units; quantitative fracture density, azimuth and aperture, and whether fractures are open or filled with secondary minerals; strike and dip of dikes (if any); fault imaging and detection of differential tilting across faults. Because the televiewer provides a 360^{o} image, it will be generally superior to the FMS for these objectives. However, FMS will probably be much more sensitive to variations in alteration and may detect some features missed by televiewer. Stress measurement may not be very useful here, because stress direction may be controlled by local topography.

3. Wireline packer: fluid samples for hydrothermal alteration studies. This tool provides the only in situ fluid-sampling capability in this environment. Technical problems are anticipated in parts of the hole: long pumping times when permeability is low; no fluid samples obtained when permeability is very low; and possibly temperatures too high for the packer and electronics. Low priority?

4. Packer: permeability (>10 m scale), for hydrothermal processes objective. Moderate priority?

5. Temperature tool (high-temperature): identification of zones with active fluid flow; heat flow. Temperatures may be too high for the L-DGO combinable temperature tool. At least three

logging runs of this tool may be needed. Drilling-related circulation probably will cool the hole enough for logging, possibly making it difficult to determine equilibrium thermal gradient. High priority?

6. Magnetometer/susceptometer: magnetic properties of lower oceanic crust. High priority?

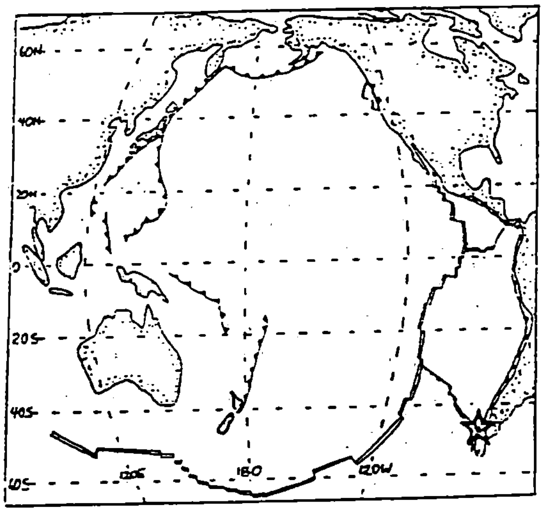
7. Dual laterolog: resistivity of massive units, for fracture porosity of the lowest-porosity zones; relative proportions of subhorizontal to subvertical fractures. High priority; conventional resistivity logs will probably not be reliable because of anticipated very high resistivities.

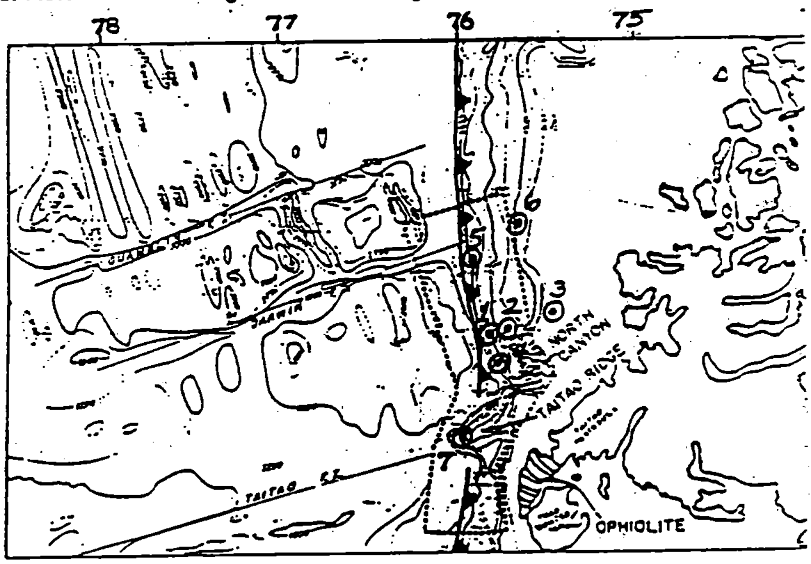
NEED FOR NEW LOGGING TECHNOLOGIES :

Minor hole cooling for standard tools. Temperature tool reliable to 200°C.

Chile Triple Junction

Many of the subduction zones of the Pacific have experienced ridge-crest subduction during the Tertiary. By studying a currently active example of ridge subduction, we can more fully understand the incomplete clues in the rock record of ancient ridge subductions. With two suites of forearc drillsites (one perpendicular to the point of ridge-trench collision and one sampling forearc before, during, and after collision), one can determine the effect of ridge subduction on forearc vertical motions, hydrothermal circulation, deformation, and erosion. Sites listed below are for a two-leg program, but only one leg is scheduled. Asterisks mark a guess concerning which sites will be drilled during this one leg:





Site I.D.	Water Depth	Penetration Sed.	Bsmt.	Log Hours	
*TJ-1	2320	800	25	73	base of trench slope, during ridge subduction
*TJ-2	1700	800	--	43	mid-slope
*TJ-3	1020	800	--	41	upper slope
*TJ-4	2905	300	100	55	base of trench slope, just after ridge subduction
*TJ-5	2760	800	25	74	base of trench slope, just before ridge subduction
TJ-7	1280	500	50	36	Taitao Ridge
*TJ-8	2500	700	50	36	base of trench slope, during ridge subduction
TJ-9	1900	700	--	34	upper slope, long after ridge subduction
TJ-10	2025	600	--	33	mid slope, long after ridge subduction
TJ-11	800	900	10	26	upper slope, long after ridge subduction
TJ-12	1800	500	25	31	upper slope, long after ridge subduction
TJ-13	2050	800	--	36	mid slope, long before ridge subduction
TJ-14	1125	700	--	33	upper slope, long before ridge subduction
TJ-15	900	700	--	33	upper slope, long before ridge subduction

000172

PREVIOUS PLANS FOR LOGGING:

Chile Triple Junction (5/89 DMP)

Scientific Objectives

Investigate subsidence, deformation, volcanism and metamorphism within the collision zone.

Investigate the process of ophiolite emplacement at Taitao Ridge.

Investigate the process of "rebuilding" of the margin after the triple junction passes northward.

Relevant DMP Thematic Thrusts

Intraplate stress
Hydrogeology

Logging Programme

Sites TJ-1, TJ-4, TJ-5 :

Standard logging suite (including FMS)
Wireline packer
Geoprops probe
WSTP

Site TJ-7 :

Standard logging suite (including FMS)

Sites TJ-2 and TJ-3:

Standard logging suite (including FMS)

There is a possibility of high temperatures at these sites. ODP needs to think seriously about high temperature tools. If FMS cannot be run because of temperature considerations, BHTV should be run. High-temperature cable or cableheads will need to be available.

DMP Consensus

Panel noted that stress-direction measurements appear to have been overlooked in the Chile Triple Junction programme and wish to alert CEPDPG to this apparent omission.

Sites TJ-8, TJ-9, TJ-10:

These three sites have recently been proposed to study how the continental margin develops. In the absence of further information, the logging programme should be the same as that for sites TJ-1 et seq.

DMP recommendations of 5/89 were made before thematic panels asked the proponents to expand the drilling to two legs. A subsequent CEPDPG refinement utilized the two-leg scenario and DMP recommendations, including the DMP recommendation for some fluid objectives. Sites to be drilled in the current one-leg plan have not been specified in detail, but they are likely to be almost the same as in the original DMP evaluation (except TJ-8 could be substituted for TJ-5).

LEG OBJECTIVES:

1. Effect of ridge trench collision on lithologies and depositional environments of slope sediment sequences (all sites). Lithologies from standand logs, depositional environments from FMS. Chance of success: very good. Largely achievable with core, but RCB and possible sands will limit core recovery.

2. Effect of ridge trench collision on vertical motion history of trench slope (TJ-1, TJ-2, TJ-3). Paleodepth indicators are large forams (cores) and sedimentary facies (cores, FMS, standard logs). Chance of success: fair, because forams have poor depth resolution in moderately deep water. Porosity and density from standard logs are useful, but not essential, for backstripping/decompaction.

3. Effects of hydrothermal circulation on lower trench slope, before, during and after ridge subduction (TJ-1, TJ-4, TJ-5).

a) present fluid flow can be measured with geoprops, wireline packer, and temperature tool. No reentry cone for packer; drilling packer possible. Chance of success: uncertain. Only

T-tool has been tested in ODP. Measure temperature with Uyeda probe and T-tool and estimate thermal conductivity from log-based mineralogy. Possible high downhole temperature at TJ-4 may prevent use of geoprops, wireline packer, and T-tool.

b) fluid samples from Barnes WSTP, pressure core sampler, and wireline packer. Fluid chemistry very important. Relative chlorinity log from standard logs.

c) porosity from standard logs, approximate fracture pattern from FMS. Chance of success: very good.

d) sediment mineralogy and geochemistry from standard logs may give clues to hydrothermal circulation history. Chance of success: fair, much less straightforward than for oceanic crustal analogues with "known" pre-hydrothermal composition.

4. Structural fabric and deformation at toe of overthrusting plate, and relation to ridge subduction (TJ-1, TJ-4, TJ-5). High-resolution structural dip, folding, tilting, and delineation of many fractures - all oriented - with FMS or televiewer. FMS probably better (though not 360^{o} picture) because many sediments are high porosity and may have washouts. Chance of success: very good.

5. Sediment source history. Mineralogy (including clay mineralogy) from standard logs.

LOGGING TOOL OBJECTIVES:

1. FMS: structure and deformation of overriding plate, sedimentary facies, stress direction (not a stated leg objective). High priority at toe sites TJ-1, TJ-4, TJ-5, and TJ-8. Moderate priority at "undeformed" sites TJ-2 and TJ-3.

2. Standard logs: lithology, mineralogy, temperature, chlorinity, seismic stratigraphy (not a stated leg need). Moderate priority at all sites, all 400-825 m penetration.

3. Wireline packer: hydrothermal circulation (fluid flow, fluid properties, fluid sampling, permeability) at toe sites TJ-1, TJ-4, and TJ-5. Geoprops and WSTP would be valuable in addition, for achieving the important (but not prime) objective of studying hydrothermal circulation associated with underthusting of very hot crust.

4. Pressure core sampler: gas (methane?) sampling of clathrates, fluid chemistry. Chance of success: uncertain, minimal ODP tests.

NEED FOR NEW LOGGING TECHNOLOGIES:

Toe sites (TJ-1, TJ-5, & TJ-4) could have dramatic temperature variations and some hot fluids. Wireline packer sampling of hot fluids desirable but not possible. Using fluid circulation to cool the hole will greatly reduce the usefulness of temperature logs. Wireline packer and geoprops have not been used in ODP yet, but ODP use long before this leg is planned.

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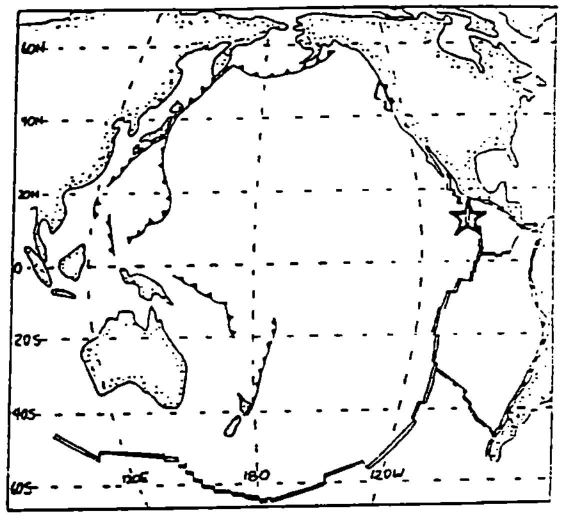
East Pacific Rise

With the exception of 50 m of bare-rock drilling on the Mid Atlantic Ridge (Legs 106 and 109), every DSDP and ODP basement penetration has sampled oceanic crust after much or all of its hydrothermal alteration is completed. In contrast, this program proposes to sample crust before and during the early phases of hydrothermal circulation. Bare rock drilling at and near the crest of the East Pacific Rise may reveal the physical and compositional structure of young oceanic crust, as well as the physical and chemical characteristics of earliest alteration.



The current phase of CEPAC will only begin the first site, with anticipated penetration of 100-300 mbsf. Hot (400°C), brittle rock is expected; DCS and slimhole logging will be used. Because of anticipated poor hole conditions, penetrations may be optimistic and holes may not be loggable.

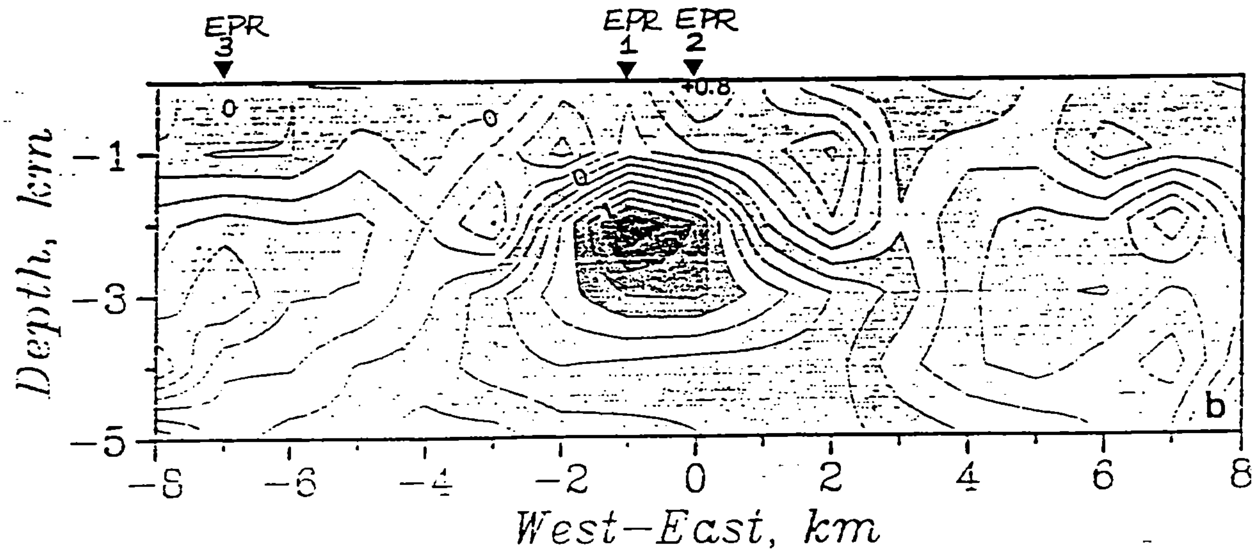


Figure: Crustal velocity anomalies, computed as local differences from an area-wide mean velocity depth structure (Toomey et al., 1990). Black negative anomaly is magma chamber.

Site I.D.	Water Depth	Penetration Sed.	Bsmt.			
EPR-1	-3500	0	1000-1500	R	Legs 1 & 2?	slightly off axis
EPR-2	-3500	0	500	R	Leg 3?	ridge axis

PREVIOUS PLANS FOR LOGGING:

DMP recommendations of 5/89 were:

EPR Bare Rock Drilling

Scientific Objectives

Definition of water-rock reaction zone above the axial magma chamber.

Physiochemistry of earliest phase of hydrothermal alteration.

Physical nature of geophysical horizons.

Spatial and temporal variability of magma composition.

Physical and compositional nature of zero-age crust.

Long-term experiments to determine temporal variations in the physical state of the crust and the chemistry of circulating fluids.

Relevant DMP Thematic Thrusts

Crustal structure and composition
Intraplate stress
Long-term monitoring
Hydrogeology

Logging Programme

With no temperature and diameter limitations:

Standard logging suite (including FMS)
BHTV
Wireline packer
Packer
Temperature
Magnetometer/susceptibility
VSP

In reality, temperatures of up to 400°C are expected. Unless hole cooling experiments are successful, high-temperature tools will be needed. A possibility would be to run Schlumberger hostile environment logging (HEL) tools but only to intermediate depths. Target must be to get as close to the above suite as possible taking account of the expected temperatures and with the possibility of a 4-inch hole.

At all subsequent DMP meetings, DMP considered high-T options. The 9/89 joint meeting of DMP and LITHP set high-T logging priorities as: temperature, fluid resistivity, formation resistivity, gamma ray, sonic, caliper, flow, and pressure. Based on costs and availabilities for such tools, the 10/90 DMP meeting revised high-T priorities to: 1) temperature and fluid pressure, 2) fluid sampling, and 3) formation resistivity.

In 9/90 the East Pacific Rise Detailed Planning Group report said, "If priorities must be assigned, the highest must be placed with achieving a high rate of core recovery (at least 50%). If the DCS, which will receive its next testing on the initial EPR engineering leg, does not provide adequate recovery, additional efforts should be put into developing the capability to ream the holes so that standard diameter logging tools can be used to compensate for low core recovery. . . Determining the temperature structure in the upper crust in the mid-ocean ridge environment is undoubtedly the single most important goal of downhole operations. . . The next most important single measurement would be of the fluid conductivity, which could be used as an indicator of the salinity of the fluids." The EPRDPG also suggested pressurized fluid sampling, geochemical logging, resistivity, velocity, caliper, televiewer, permeability, and instrumented hole sealing. However, they scheduled only 3.5 days total for downhole measurements and no time for reaming, and TAMU has said subsequently that actual downhole measurement time may be much smaller. Realistically, one can expect only temperature logging, fluid sampling, and hole sealing to occur on the first EPR leg, though cochiefs would want backup capability for much more extensive downhole measurements.

LEG OBJECTIVES:

1. Physical and chemical characteristics of hydrothermal alteration of newly formed crust.

a) Potential fluid conduits: large-scale porosity (e.g. pillows, talus), fine-scale porosity (e.g. vesicularity), and fracture porosity. All three types of porosity can be detailed through a combination of several logs: (1) standard sonic (V_p, V_s, attenuation), density, neutron, and resistivity yield total porosity measurement with somewhat different depths of penetration; in combination, they distinguish true porosity from apparent porosity of bound water in clays; (2) dual laterolog sees a deeper, more representative porosity and provides a qualitative indicator of the relative proportions of subhorizontal and subvertical fractures; (3) borehole televiewer and FMS image individual fractures (azimuth, aperture, and whether they are filled or open); (4) borehole televiewer and FMS image large vesicles and provide a semiquantitative measure of vesicularity; and (5) borehole televiewer and FMS provide a high-resolution picture of the style and geometry of large-scale porosity.

b) Permeability. In high-permeability formations such as those anticipated, permeability can be measured with the straddle packer, single drillstem packer, or probably by flowmeter injection.

c) Active fluid flow. Temperature logs can be obtained on most tool strings, but the anticipated high temperatures require dedicated runs of a high-temperature tool. Temperature logs indicate the locations of zones of present fluid flow and provide semiquantitative measures of flow rate. When combined with a thermal conductivity log from log-based mineralogy and porosity, the ability of temperature logs to detect subtle fluid flow is substantially improved. If several temperature logs are available, an equilibrium thermal gradient can be calculated, yielding heat flow and an indication of broad-scale conductive vs. convective heat transport. Temperature logs may also be needed during the drilling, for safety reasons.

d) Fluid sampling. Determination of the chemical composition of pore fluids is essential for an understanding of mass fluxes into and out of basalt due to hydrothermal circulation. Wireline packer is the only method for obtaining direct, uncontaminated samples of pore fluids rather than drillhole fluids. However, the high temperatures will exclude wireline packer use and require tools that sample drillhole fluids.

e) Hydrothermal alteration. Abundance of alteration minerals can be determined by inversion of standard logs. Core measurements of cation exchange capacity, coupled with a resistivity log and log estimates of bound vs. free water, appear to be more reliable than straight geochemical log inversion. Log-based estimation of alteration mineral abundance is more representative than core studies of alteration and is therefore essential to understanding the permeability distribution.

2. Geophysical properties of very young oceanic crust, and the relationship of hydrothermal alteration to these properties. Between-site comparison of geophysical logs, as well as intrasite comparison of geophysical logs to alteration indices, can reveal the effect of hydrothermal

alteration on geophysical properties.

a) In situ velocities are essential as ground-truth for regional mapping of seismic horizons; core measurements are non-representative. Velocity (V_p, V_s, attenuation), density, and porosity can be measured with standard logs, but multichannel sonic would be superior to standard sonic in the high-porosity portions of these holes. A VSP would be valuable at each site, because the shallow sampling of the sonic tools may not be representative of average velocity at seismic frequencies in high-porosity, rubbly basalt. At least one VSP is essential at EPR-1, for imaging of the magma chamber ahead of the bit, both for safety and scientific reasons.

b) Magnetic properties can be measured with a magnetometer/susceptometer. In situ magnetic measurements in the hot portions of the hole will see a thermoviscous magnetization free of the obscuring effects of cooling and pipe magnetization on cores; however, the hole cooling during drilling and possibly logging may affect this magnetization. Intersite comparison of magnetization directions will indicate the extent to which tectonic tilting is responsible for the anomalous magnetization directions often seen in older crust.

3. Physical and compositional structure of young oceanic crust.

a) Flow delineation. Identification of individual flow units can be accomplished with a variety of standard logs, both geophysical and geochemical. A magnetometer log is also useful; the magnetometer on the standard string will suffice. FMS and especially borehole televiewer refine this unit delineation.

b) Volcanology: discrimination of pillows, sheet flows, sills, talus, and possible dikes. This discrimination is largely achievable with standard logs, but the FMS and especially the borehole televiewer provide a final confirmation.

c) Geochemistry and modal mineralogy of flow units. Major element geochemistry from standard logs can provide a quantitative picture of fractionation, alteration, and -if present- changing magma sources. Because the geochemical logs sample both fresh and altered rock, alteration may partially prevent log detection of some primary geochemical differences. However, the advantage of this representative and quantitative sampling of alteration is that one can potentially estimate the total geochemical fluxes into and out of basement, caused by hydrothermal alteration. A prime target of the geochemical logging is the reaction zone overlying the axial magma chamber at EPR-1. Modal mineralogy can be calculated from the geochemical logs.

4. Long-term experiments, to detect changes in physical state of crust and chemistry of circulating fluids. Holes may be sealed for long-term monitoring of fluid pressures, temperatures, flow rates, and chemistry.

LOGGING TOOL OBJECTIVES (Assuming successful reaming):

1. Temperature tool (high-temperature): identification of zones with active fluid flow; heat

flow. Temperatures will be too high for the L-DGO combinable temperature tool. At least three logging runs of this tool may be needed. A major circulation program to cool the hole for drilling and logging might make it impossible to determine equilibrium thermal gradient; thus only the zones with very active fluid flow will be identifiable. High priority.

2. Fluid sampler: fluid samples for hydrothermal alteration studies. High priority throughout the hole. The high temperatures exclude wireline packer use; possibly a Sandia or Los Alamos tool will be used. Technical problems such as slight sample contamination are anticipated.

3. Standard logs: large-scale porosity for comparison to permeability; thermal conductivity (combined with temperature logs) for fluid flow; abundance and type of alteration minerals especially near magma chamber at EPR-1; geophysical properties (especially velocity) for ground truth of seismic horizons; delineation and identification of volcanic units; geochemistry for fractionation, changing magma sources, alteration, and mass flux into and out of basalt; modal mineralogy.

4. FMS and/or televiewer: refined delineation of volcanic units; quantitative fracture density, azimuth and aperture, and whether fractures are open or filled with secondary minerals; strike and dip of dikes (if any) and sills; fault imaging and possible detection of differential tilting across faults; style and geometry of large-scale porosity; imaging of alteration zones. Because the televiewer provides a 360° image, it will be generally superior to the FMS for these objectives. However, FMS will probably be much more sensitive to variations in alteration and may detect some features missed by televiewer. High priority for both. The dewared digital televiewer will require only modest hole cooling.

5. Packer/flowmeter: permeability (>10 m scale) for hydrothermal processes objective. High priority.

6. Magnetometer/susceptometer: in situ magnetic properties of very young oceanic crust, including effect of tectonic tilting and alteration; flow delineation. High priority. Gyro orientation will be needed for tectonic tilting objective.

7. Vertical seismic profile: high-resolution imaging of both top and bottom of the magma chamber at EPR-1 and 2; velocities more representative of seismic velocities than those obtainable from sonic logs. Can a three component VSP confirm a magma chamber, through absence of deep shear energy? High priority at EPR-1 on both legs, because of possible influence on subsequent drilling decisions.

8. Long-term experiments: see Leg Objective #4 above.

LOGGING TOOL OBJECTIVES (assuming 4" DCS):

The hydrothermal processes objective is severly impaired. Geochemical and magnetic properties objectives will be entirely dependent on core recovery. Key geophysical properties (velocity, magnetization) not obtainable; a sonic log can be run but velocities will be unreliable in pillows.

1. Temperature tool (high-temperature): identical to #1 above.

3. Fluid sampler: identical to #2 above.

3. Standard logs: large-scale porosity for comparison to permeability; delineation of some volcanic units.

4. Long-term experiments: see Leg Objective #4 above.

5. Packer/flowmeter: is it feasible to set the packer in casing and log permeability with a slimhole high-T flowmeter?

NEED FOR NEW DOWNHOLE MEASUREMENT TECHNOLOGIES:

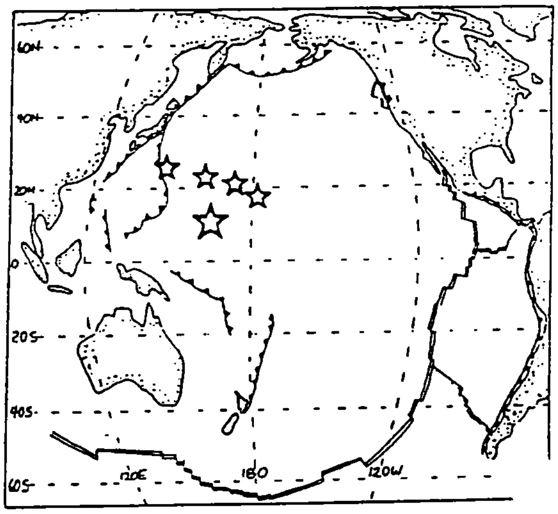
High-temperature logging cable. Slimhole, high temperature (400°C) logging tools, or cooling hole for standard tools. Temperature and fluid sampling tools reliable to 400°C. Design and development of long-term formation monitoring equipment and devices for hole-sealing.

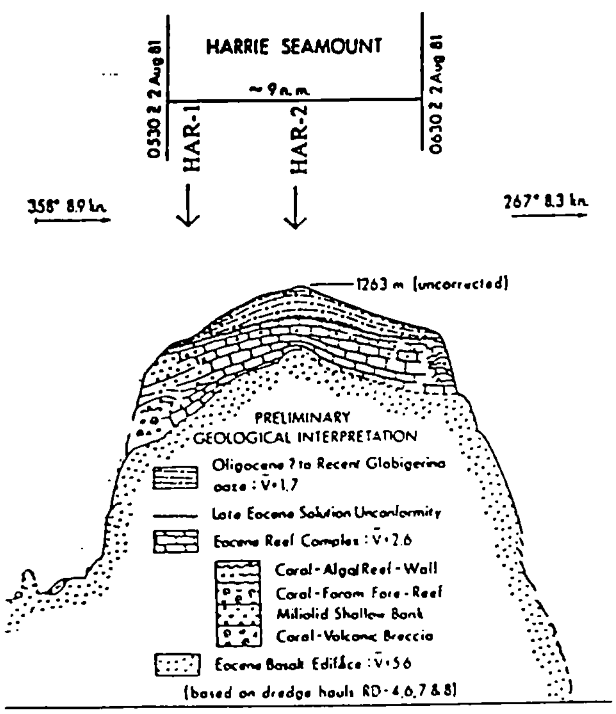
Atolls and Guyots

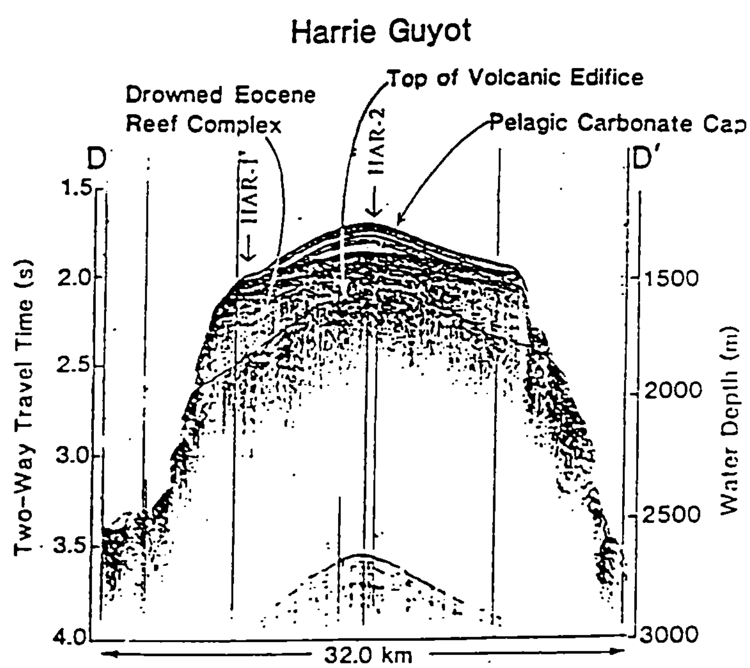
The timing and magnitudes of Tertiary sea level fluctuations can be studied on continental margins (e.g. Vail; Great Barrier Reef leg). However, these apparent sea level variations are a convolution of a "margin response" with actual eustatic sea levels, and the two factors have not been separated unambiguously. An alternative approach, used here, is to study the record of sea level variations in a drowned atoll. Both Cretaceous and Eocene reefs will be drilled, to date sea level changes and determine the causes of reef demise.

A detailed planning group will meet soon to develop a two-leg program consisting of most of the sites listed below.

Logging on this leg is likely to make only a modest contribution to the many cruise objectives: Late Cretaceous to Eocene sea level changes (nominally Late Cretaceous to Recent, but post-Eocene sedimentation is open-ocean pelagic), anatomy of reef facies in drowned atolls, timing and cause of atoll drowning, subsidence rates, chronology of volcanic events, paleolatitudes, and Early Cretaceous to Paleogene faunas.







Site I.D..	Water Depth	Penetration Sed.	Bsmt.	
Maj-1	4125	875	50 R	archipelagic apron of Cretaceous atoll
Har-1	1500	400	50	summit of drowned Eocene atoll
Har-2	1300	300	150 R	summit of drowned Eocene atoll
Pel-3	1080	130	20	summit of drowned atoll
Syl-1	1350	200	150 R	summit of drowned Cretaceous atoll
Syl-2	1350	200	50	summit of drowned Cretaceous atoll
Syl-2A	1350	200	50	summit of drowned Cretaceous atoll
Syl-3	4800	800	125 R	archipelagic apron of Cretaceous atoll
Allison	1440	750	--	summit of drowned Cretaceous atoll
M.I.T.	1330	300	--	summit of drowned Cretaceous atoll
Caprina A	1610	150	--	summit of drowned Cretaceous atoll
Caprina B	1600	300	--	summit of drowned Cretaceous atoll
C. Johnson A	1800	150	100	summit of drowned Cretaceous atoll
C. Johnson B	1750	250	50	summit of drowned Cretaceous atoll
Huevo A	1365	800	200 R	summit of drowned Cretaceous atoll
Huevo B	1370	275	--	summit of drowned Cretaceous atoll

PREVIOUS PLANS FOR LOGGING:

Never evaluated by DMP. Proponents included standard logging or sonic and density logging for all sites except shallow PEL-3 and Caprina A.

LEG OBJECTIVES:

1. Diagenetic history of the coral caps, a likely recorder of sea-level fluctuations. Sea-level changes have diagenetically overprinted the original carbonate porosity structure of the reefs, via solution and precipitation of calcite and dolomite. Standard logs can be used to calculate logs of porosity, calcite percentage, and dolomite percentage. Coupled with isotopic and petrographic data from cores, these logs should help to unravel the complex diagenetic histories of the reefs. On Leg 133 (NE Australia), FMS detected characteristic diagenetic signatures of sea-level fall.

2. Detection of sea-level falls, through identification of reef-derived turbidites in the archipelagic apron sites. Thick (>2m) turbidites are readily delineated with standard logs, and the FMS is particularly good at determining sedimentary facies and detecting porosity gradients in thin beds. However, the sea-level signal in the archipelagic apron may be as subtle as a trace of reef component in dominantly pelagic carbonate turbidites. Thus the logs may or may not be useful for this objective.

3. Basalt geochemistry. Dredging indicates that an unusual basalt composition (DUPAL) characterizes a seamount province that encompasses most of these seamounts, as well as many seamounts now being subducted at the western margin of the Pacific plate. Geochemistry of these basalts is a secondary cruise objective. Obtaining representative major-element geochemistry of these guyots also would contribute to calculations of geochemical budgets for arc volcanism. Standard logs would provide these continuous geochemical records.

4. Anatomy of reef and associated facies of drowned atolls. Reef facies are tentatively identified on seismic at most sites; synthetic seismograms from standard logs will compare these identifications to core and log-based ones. FMS can detect some variations among different reef facies. The major uncertainty is whether subsequent diagenesis has obscured the characteristic FMS signatures of the different facies.

LOGGING TOOL OBJECTIVES:

1. Standard logs: porosity and mineralogy (particularly calcite/dolomite) of reef deposits for reef diagenetic history; turbidite delineation and possible detection of a low-stand turbidite signature, for identification of sea-level signals in the archipelagic apron sites; basalt geochemistry for geochemical reference sites; synthetic seismograms at all sites for comparing within-site determinations of reef facies to seismic identifications of facies. Chances of success: fair to very good, depending on objective. Current uncertainty about the reliability of ODP magnesium logs should be resolved well before this leg; potential impact on the usefulness of geochemical logs on this leg is substantial.

2. FMS: delineation of reef facies; detection of diagenetic signature of sea-level change; turbidite delineation in the archipelagic aprons. Priority: moderate, because FMS will help to compensate for the anticipated <10% core recovery in reef facies.

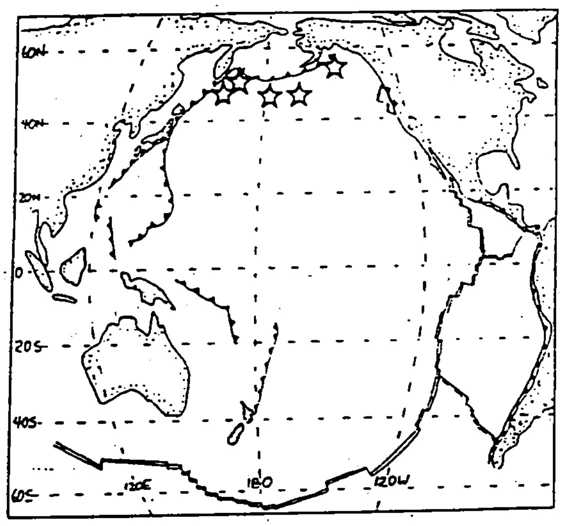
NEED FOR NEW LOGGING TECHNOLOGIES:

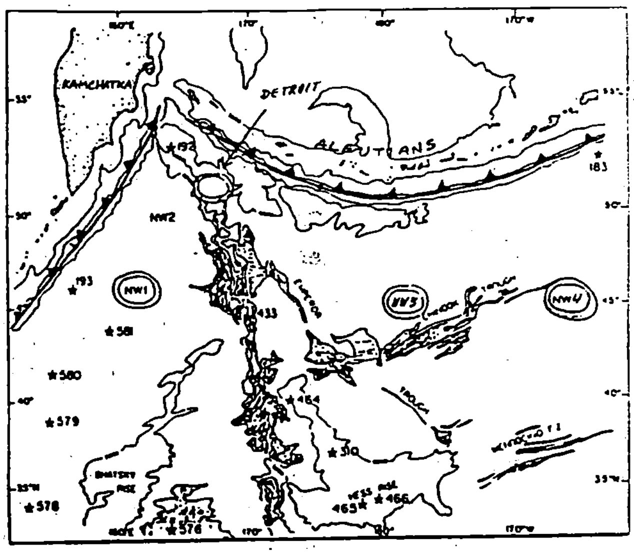
None.

North Pacific Transect

Complementing the Neogene paleoclimate objectives of the Equatorial Pacific program, this North Pacific Transect program examines the effect of climate change on the Subarctic Front. Changes in surface ocean and atmospheric circulation, productivity, deep water circulation, continentally derived eolian material, and ice-rafted sediments can be examined in an E-W array of high-latitude Pacific sites.

All sites have nominal 50m basement penetration, but actual penetration is likely to be <10m with XCB, so no basement logging is likely. Penetrations at NW sites could be twice as large as indicated.





Site I.D.	Water Depth	Penetration Sed.	Bsmt.	
DS-1	2400	500	<50	Neogene surface and deepwater history
DS-2	3100	500	<50	"
DS-3	3855	<900	--	"
NW-1A	5330	230?	<50	Neogene climate, volcanism
NW-3A	5800	100?	<50	Neogene climate, eolian transport
NW-4A	5685	100?	<50	Neogene climate, eolian transport
PM-1	3660	310	<50	Neogene climate, surface-deep water history

PREVIOUS PLANS FOR LOGGING:

Never evaluated by DMP. Proponents included quad and geochemical logging for all sites except shallowest ones.

LEG OBJECTIVES:

1. Changes in location of the Subarctic Front as a function of time. Both high and low frequency changes are anticipated, with a sedimentary signature of fluctuating carbonate and particularly diatom content. Calcite and opal logs, based on mineralogy determination from standard logs, will reflect when the Subarctic Front was over each site. Diatom abundance dominates physical properties logs (velocity, density, porosity, and resistivity); thus the FMS is likely to detect any fluctuations in diatom abundance, at Milankovitch or higher frequencies, resulting from changes in location or intensity of Subarctic Front upwelling.

2. Changes in atmospheric circulation as a function of time, as reflected in changing quantity and composition of eolian components. Clay mineralogy and possibly other non-biogenous mineral logs, based on mineralogy inversion of standard logs, will be very important for achieving this objective. In contrast, even an intensive XRD analysis of cores would provide only enough data to identify long-term changes in clay mineralogy.

3. Timing and nature of the middle Miocene shift from carbonate to siliceous pelagic sedimentation. Quantitative carbonate and opal logs will reveal the detailed character of this transition.

4. Temporal changes in carbonate dissolution, as a function of site depth (DS-1, 2, &3). Continuous intersite correlation via standard logs will yield continuous records of differential sedimentation rate at DS2 & 3, mapped against a DS-1 standard. When this intersite mapping function is applied to carbonate logs, the resulting log of differential carbonate "sedimentation" rates is effectively a log of depth-controlled differential carbonate dissolution rate (unless clay-mineral content varies between sites). If slumping has affected the stratigraphy at either site, the intersite correlation will reveal the anomaly. Better yet, FMS logs at the two sites would identify any slumped intervals and prevent possible misinterpretation of core data from such intervals. This is the same strategy, for the same purpose, used successfully on Leg 130.

5. Temporal and lateral changes in deposition of ice-rafted sediment. It is difficult for coring to recover a representative sample of ice-rafted particles larger than 3 mm, but the FMS has been shown to image individual grains in granites. Thus it is possible that the FMS could be used to image the sizes and abundances of coarse ice-rafted components. How to quantitatively analyze the FMS images in this context is less certain.

6. Stress direction. Though stress is not a stated leg objective, the geographic distribution of sites is very good for examining the effect of Aleutian-Alaskan subduction zone on the Pacific stress pattern. Chance of success: fair-poor; XCB basement penetration probably is not

sufficient for detection of basement breakouts, and overburden probably is too thin for shallow basement breakouts.

LOGGING TOOL OBJECTIVES:

1. Standard logs: calcite, opal, and physical properties logs for identification of both movements of the Subarctic Front and character of the transition from carbonate to siliceous sedimentation; clay mineralogy logs, for identifying influxes of arc-derived ash, changes in atmospheric circulation, and aridity/humidity variations in source regions of eolian components; intersite correlation (DS-1, 2 & 3) for differential carbonate dissolution. Chances of success: very good.

2. FMS: high-resolution record of diatom-induced porosity variations, possibly caused by Milankovitch forcing; slump detection (if present at DS-1, 2 & 3); variations in ice-rafted sediments; stress direction. Chance of success: uncertain; not known in advance whether slumps or Milankovitch porosity fluctuations will be present.

3. Borehole televiewer: stress direction. Low priority?

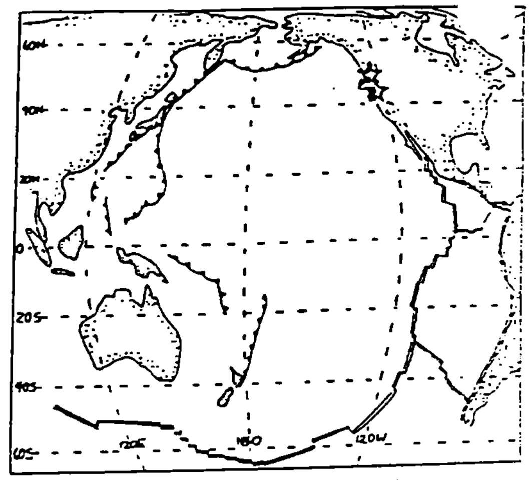
NEED FOR NEW LOGGING TECHNOLOGIES:

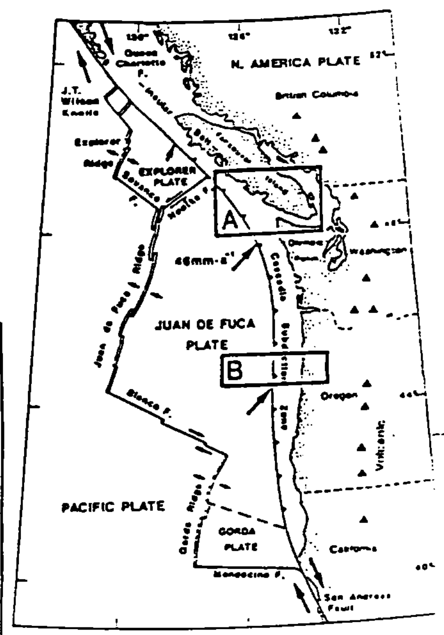
None.

Cascadia Accretionary Prism

Recent major advances in our conceptual understanding of accretionary prism dynamics are badly in need of verification by drilling. Oregon and Vancouver Margins are thought to be accretionary prisms in which one can readily assess the effects of pore pressures, fluid transport, and fluid generation on deformation and particularly thrusting within the upper part of the accretionary prism. In both areas, the interplay of fluids and mechanical state appears to be the key.

This was originally two separate but complementary programs on the tectonics of accretionary prisms: a suite of holes examining fluid flow in the shallow sediments of the Oregon margin, and two deep holes examining structure and underplating at the decollement of Vancouver Island margin. The two programs were merged by the Cascadia Detailed Planning Group into two one-leg programs. Only the first leg is currently scheduled and considered here.





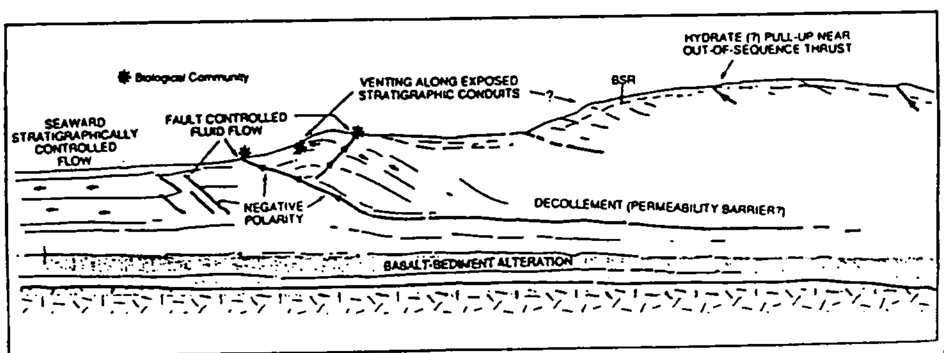


Figure 2. Conceptual cross sections showing geologic setting and possible fluid expulsion scenarios for central Oregon margin.

Figure 1. Continental margin of southwestern Canada and northwestern United States showing the plate-tectonic regime and main tectonic elements. (A) Vancouver Island margin and (B) Oregon margin study areas.

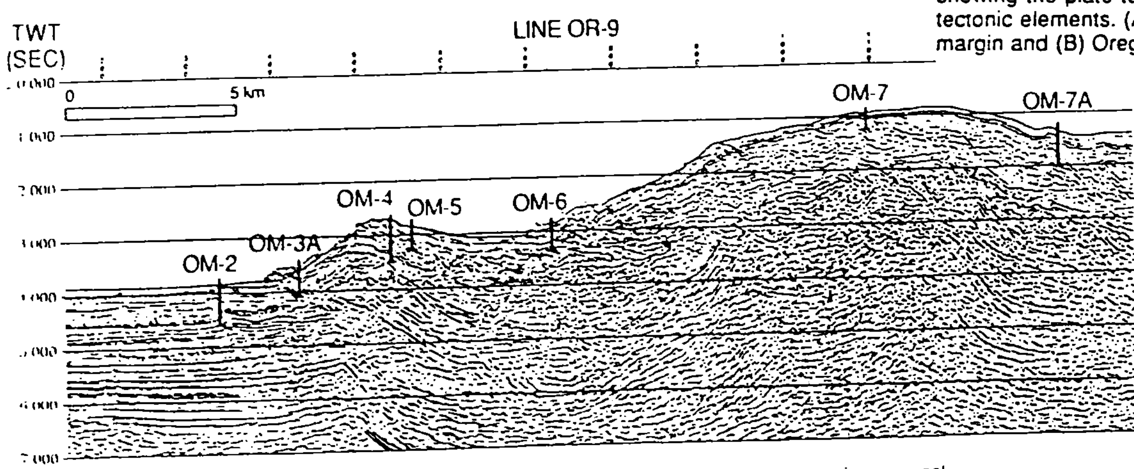


Figure 3 MCS line OR-9 showing drill sites OM-2, 3A, 4, 5, 6, 7, 7A crossing marginal ridge and second ridge

PREVIOUS PLANS FOR LOGGING:

DMP recommendations of 5/89 were used, along with associated time estimates by BRG, by the Cascadia Detailed Planning Group during their merger of programs for the two margins and development of a 1-leg program. Cascadia DPG downhole measurement plans are shown in the table below. In general, these plans are consistent with the DMP plans, except that the very time-consuming combination of geoprops plus wireline packer plus packer is consolidated into only three sites. The 2/8/91 ad hoc meeting of a DMP subgroup will consider hole conditions, a very important issue for downhole measurements in accretionary prisms.

Cascadia Accretionary Prism (DMP 5/89)

Scientific Objectives

Oregon Margin : present and past fluid expulsion processes, pathways, and effects in the several structural and stratigraphic settings ; chemistry, sources and diagenetic effects of the fluids.

Vancouver Margin : deformation at the leading edge of the decollement, geology and physical properties of the materials involved, flow of heat and fluids, long-term observatories.

Relevant DMP Thematic Thrusts

Intraplate stress
Long-term monitoring
Hydrogeology

Logging Programme

Nankai results are likely to guide the planning of this programme. Key issues are physical properties and fluid characteristics.

Each hole:

Standard logging suite (including (FMS)
Geoprops Probe every 30m to base of XCB (or wireline packer every 60m)
LAST every 30m in soft sediments
WSTP every 30m in upper sediments
Rotable packer (3 - 4 deployments/1000m)
Multichannel sonic (shear source) or Schlumberger array dipole tool

Deeper holes: OR-1, VI-1, VI-2

Additional measurements:

VSP
BHTV
Rotable packer (3 - 4 deployments/1000m)

Table 1. Cascadia I drilling and downhole measurement times (Cascadia DPG)

SITE	PRIORITY	LOCATION	WATER DEPTH	PENETRATION	DRILL TIME (a)	STD logs + FMS (b)	WSTP 6 runs	CONE PLUG (c)	PACKER drill string	PACKER wire line	VSP	BH TV	TOTAL
VI - 5	1	48°40'N 125°50'W	1350	600	3.1	1.5	0.3	4.5	0.7	0.7	1.5	0.3	12.6
VI - 1	1	49°09'N 126°37'W	2500	600	4.5	1.6	0.3	-	-	-	-	-	6.4
VI - 2d	1	28°16'N 126°24'W	2100	500	3.6	1.6	0.3	-	-	-	1.5	-	7.0
VI - 3*	2	48°19'N 126°17'W	1350	500	3.1	1.5	0.3	-	-	-	-	-	-
OM - 3	1	44° 38.53'N 125°19.55'W	2655	540	3.5	1.7	0.3	4.5	0.7	0.7	1.5	0.3	13.2
OM - 3A	2	44°40.37'N 125°19.55'W	2625	585	3.5	1.7	0.3	4.5	0.7	0.7	1.5	0.3	-
OM - 7	1	44°40.38'N 125°07.34'W	665	300	1.6	1.2	0.3	-	-	-	-	-	3.1
OM - 7A	2	44°40.38'N 125°03.12'W	1005	630	2.9	1.6	0.3	-	-	-	-		-
OM - 8	1	44°59.55'N 125°22.22'W	2400	660	4.8	1.7	0.3	-	-	-	-	-	6.8
OM - 4+	1	44°40.37'N 125°19.69'W	1020	700	4.6	1.7	0.3	-	-	-	-		6.6
OM - 2+	1	44°40.37'N 125°21.58'W	2865	640	4.0	1.8	0.4	-	-	-	-		-
													55.7

Total time (d): 57.7

a) Estimates for single hole, using APC/XCB to TD or bit destruction
b) Assumes SES
c) Includes time to drill hole B to 500 m, set casing, and install plug
d) Total time includes two extra days for additional downhole experiments (Geoprops/LAST).
* This Site to be regarded as alternate to Site VI - 5
+ Only one Site between these two will be drilled depending upon the results of previous sites

LEG OBJECTIVES:

1. Pore pressure, permeability, and fluid flow at a variety of scales. These measurements will be used at both margins for determining hydraulic conditions, fluid expulsion pathways, and distinguishing intergranular flow from fault-plane flow. Measurement techniques will vary with depth and coring technique: LAST at shallow depth, geoprops for intermediate depths (NCB), wireline packer for greater depths (XCB or RCB), and packer only in the three sites with reentry cones.

2. Pore fluid composition, as an indicator of pore fluid origin, methane content, carbonate transfer and diagenesis, and fluid sources (e.g. compaction, subducted crust). Interstitial water sampling should be supplemented by in situ sampling, because methane will be lost from cores and because sands and fault zones may be most important for fluid flow but difficult to recover as uncontaminated cores. Use Barnes/Uyeda for shallow sediments and geoprops or wireline packer for deeper sediments, and pressure core sampler at various depths.

3. Porosity, both intergranular and fracture, for comparison with fluid-flow indicators and consequent evaluation of controls on fluid flow. Also for evaluation of effects of pore pressure and deformation on compaction. Standard logs (neutron, density, resistivity) and FMS.

4. Velocity, linked to both seismic and porosity. Velocity and density logs will provide a link between core depth and seismic traveltime through a synthetic seismogram. The direct controls on velocity (porosity and mineralogy) and their indirect causes (pore pressure and lithification) can be examined with interlog relationships. Together, these two links should provide nonunique but useful tools for interpreting the causes of lateral and vertical velocity variations detected by multichannel seismic and sonobuoys.

5. Temperature, heat flow, and thermal conductivity, as indicators of fluid flow and nonlinear thermal gradients. Shallow heat flow measurements will be based on the APC heat-flow shoe and Barnes/Uyeda probe. Continuous, high-resolution temperature logs will be a part of most logging runs, for extrapolation of equilibrium thermal gradients. Coupled with a thermal conductivity log from log-based mineralogy, the high-resolution thermal gradient log should detect nonlinear thermal gradients and all zones of active fluid flow. Heat flow and thermal gradients have implications for material balance in accretionary prisms.

6. Methane content of bottom simulating reflectors (BSR), for estimation of methane fluxes and for calibration of BSR lateral variations seen on seismic. Standard logs will detect clathrates. Barnes/Uyeda, geoprops, wireline packer, and pressure core barrel can provide fluid samples.

7. Detailed variations in <u>structural dip, fault-zone delineation, and fracture patterns</u>. Obtainable with FMS; televiewer possibly preferable for more lithified sediments because of its 360^o imaging.

8. <u>Mineralogy</u>, both for depositional history of the margins and because of the probable impact of mineralogy (especially clay content) on hydrology. Obtainable from standard logs.

9. <u>Sedimentary facies</u>, particularly identification of slumps and turbidites, for depositional and structural histories of the margins. Obtainable primarily from FMS but also from standard logs.

10. Deployment of instruments at reentry sites, for <u>long term monitoring</u> of displacement, tilt, and changes in seismic velocity.

11. <u>Stress and strain properties of sediments</u>. Measurements of mechanical and stress state are needed to test models for the evolution of accretionary prisms. Stress measurements as a function of depth could increase understanding of why major earthquakes occur in subduction zones. However, <u>in situ</u> measurements of stress and strain properties are possible only for APC cores, using lateral stress tool. Maximum horizontal stress direction can be measured with FMS or televiewer.

12. <u>Integrated major-element geochemistry</u> for calculation of subducted elemental fluxes and comparison to arc petrogenesis. Obtainable from standard logs.

LOGGING TOOL OBJECTIVES:

1. <u>Standard logs</u>: fluid flow from temperature and thermal conductivity and from anomalous physical properties (porosity, velocity, density), link between core depth and seismic time, clathrate identification, mineralogy, major element geochemistry. Chances of success: very good.

2. <u>FMS</u>: structural dip, fault-zone delineation, fracture patterns, sedimentary facies, fracture porosity, stress direction (not a stated cruise objective). Chances of success: very good for first three, good for last three. However, FMS records may be poor for very unconsolidated sands, because of hole washout.

3. <u>Wireline packer</u>: pore fluid sampling and some pore fluid properties (e.g. Eh, Ph, T, resistivity). Chances of success: uncertain, limited ODP tests and uncertain development plans; sand caving may prevent adequate packing in some intervals.

4. Geoprops: pore fluid sampling, pore pressure, permeability, and temperature. Needs a Navidrill hole. Chances of success; uncertain, untested in ODP; sand caving may be a problem.

5. Lateral Stress Tool: lateral stress and strain, shear modulus. For shallow (APC) sediments. Chances of success: good, though few previous ODP tests.

6. Packer/flowmeter: large-scale (>10m) permeability and pore pressure. High priority for sites with reentry cones. Geoprops or wireline packer measurements may miss hydraulically most important zones; straddle packer will assure representative measurements. Some sediment intervals will be difficult to seal with the packer; flowmeter injection may be more feasible.

7. Borehole televiewer: complete imaging of fractures, faults, and deformation. Moderate priority, because objective partly achievable with FMS.

8. Barnes/Uyeda Probe: heat flow (Uyeda) as an indicator of fluid flow and other accretionary-prism processes, and fluid sampling (Barnes) for fluid geochemistry as a tracer of fluid history. Chances of success: very good for unlithified sediments (upper 400m), except for sands.

9. Pressure core sampler: gas (methane?) sampling of clathrates, fluid chemistry. Chance of success: uncertain, minimal ODP tests.

NEED FOR NEW LOGGING TECHNOLOGIES:

Several tools (FMS, wireline packer, geoprops, Navidrill, lateral stress tool, pressure core sampler, drilling packer) needed for this leg are still under development or have not been used in ODP yet. All probablly will be tested in ODP before this leg. One type of tool is potentially very valuable here but is not currently scheduled for development: a tool with the capability of determining consolidation, stress, and mechanical properties for sediments more lithified than those that can be studied with the lateral stress tool.

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Shipboard Measurements Panel *19-21 March 1991*

SUMMARY

Panel discussions included a **review of each of the shipboard laboratories; upcoming legs**; an implementation plan for **core-log data integration**; and **technical staff requirements considered with shipboard equipment requirements.** In addition, the panel met jointly with IHP, primarily to discuss the implementation of core-log data integration. The following is a summary of SMP concerns and recommendations.

Shipboard labs review

John King presented the results of his study on APC contamination. APC cores are seriously contaminated with rust which comes from the inside of the core pipe. This contamination is seen in sediments of low magnetic susceptibility (e.g. carbonates) and more extensively in the top 5-7 APC cores of each hole. However, the contamination probably occurs in **all APC** cores to some unknown extent. The problem has been compounded for ODP over DSDP because full string pipe losses were relatively frequent during DSDP and have essentially not occurred for ODP. Consequently, new pipe is not replaced all at once and the current string is old and rusted. ***The panel recommends that the practice of running a pipe pig be routinely performed during the down-going pipe trip for each hole that will be sampled using the APC.*** During legs where recovery will consist of material of low magnetic susceptibility, 'U' channel samples should be taken as continuously as possible in the top 5-7 APC's for magnetic susceptibility measurement and palaeomagnetic analyses. The panel will continue its investigation of core disturbance.

Dave Huey presented the results of his core liner handling study. ***The panel recommends adoption of Huey's recommendations as standard shipboard procedure.***

Electrical resistivity measurements are not presently made on the ship due to equipment problems. These measurements are essential for Leg 139 for determination of pore fluid advection. Discussions are ongoing among SMP members and TAMU concerning this problem; the likely solution is to borrow existing equipment for Leg 139. In addition to routine, discrete measurement of electrical resistivity, the panel discussed the equipment which was provided and used by Peter Jackson (BGS) on Leg 133 for electrical resistivity 'imaging' of the split core. The equipment which was successfully used on the Resolution was a prototype. However, his proposed phase II version of this equipment is ideally suited for shipboard core measurements which can be directly correlated to formation microscanner. SMP supports the research and development of this shipboard technique.

Upcoming Legs

Leg 139 requires equipment for the discrete measurement of electrical resistivity (see previous paragraph). Other lab requirements which were identified by the panel for this leg have all been addressed by TAMU. The panel agreed that because Mike Mottl (co-chief on Leg 139) is a member of the panel, special shipboard measurement requirements were identified early for this leg and solutions (in most cases) were found and have been implemented. The panel agreed that

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for any future legs where special shipboard measurement requirements are identified, one of the co-chiefs should attend an SMP meeting as early as possible pre-cruise.

The panel identified the Atolls and Guyots legs and the Cascadia leg as requiring special consideration. Development of procedures for elemental analyses using the XRF is required for calibration of the geochemical logging tool for both Atolls and Guyots legs. The panel will continue investigation and discussion of this requirement. The Cascadia leg may suffer similar problems as the Nankai leg where little to no log data is collected. In this situation, it will be necessary that some of the core measurements be performed at a smaller depth interval. The panel requests that one of the co-chief scientists for the Cascadia leg be approved as a guest at the next SMP meeting.

Implementation Plan for Shipboard Integration of Core and Log Data

SMP prepared a list of hardware and software needs (in priority order) required for the implementation of shipboard data integration. The most important obstacle to core-log data integration is the determination of ***reference depth*** for core data. This ***reference depth*** can be determined using a two step procedure: (1) nominal depth is corrected using software for sonic core monitor (SCM) data; and (2) the shipboard core-log data correlation specialist uses an interpolation software package to determine core ***reference depth*** by incorporating any key marker horizons and one of the following four data sets, in priority order:

- downhole gamma log and natural gamma core log
- downhole magnetic susceptibility log and core measured susceptibility log
- downhole density log and core measured density log
- downhole p-wave log and core measured p-wave log

Hardware priority list:

1. Natural gamma equipment for measurement of cores (previous SMP recommendation)
2. Magnetic susceptibility downhole logging tool
3. Sonic core monitor (TAMU development - available for Leg 141)
4. Automation of the physical properties laboratory (previous SMP recommendation)
5. Core/log data integration workstation
6. Resistivity imaging equipment (under development at BGS)

Software priority list:

1. Core data interpolation/integration software
2. Interpolation software for core-log data
3. Depth conversion software for SCM
4. Common spreadsheets

JHP/SMP agreed that the current shipboard data acquisition and data processing system should be modified to allow for the implementation of core-log data integration. The most important addition to the current process is the ability to manipulate and edit ASCII data files, shown schematically below.

The ASCII files should be archived for future user availability. These files should be the responsibility of the shipboard scientific party and "final" versions of these files should be made

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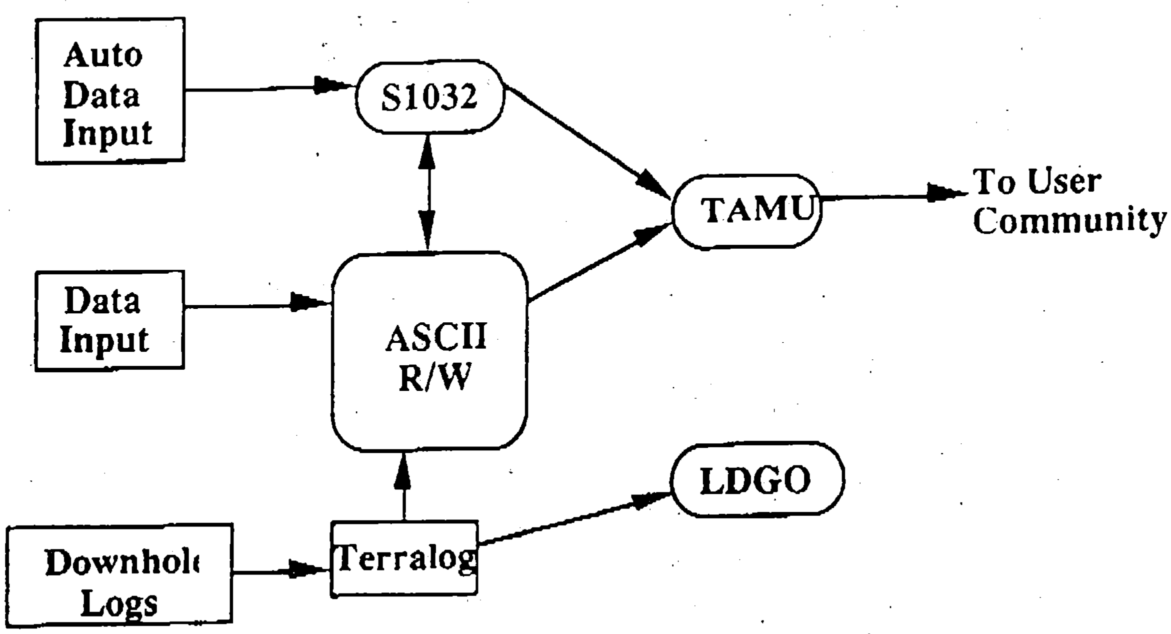
available as a "data base" for user access. Also, specific tasks must be performed to implement core-log data integration. Therefore, IHP and SMP recommend addition of a second seagoing computer system manager and one person-year for development of software tools (see software priority list items #1 and #2). IHP endorses the previous joint SMP/DMP recommendation that a core-log data correlation specialist be identified as part of the scientific party for each leg.



Technical Staff and Shipboard Equipment Requirements

SMP considered the continuing pressure on scientists to do more and more work shipboard and the problems that are caused by the static level of technical support. It was the view of SMP that deferring work to post-cruise laboratories would not provide a solution to this problem. Post cruise scientists would have great difficulty in finding enough equivalent time and funding to do the deferred work and the result would be an overall reduction in the scientific productivity of the program. The majority of work now performed by the technical support staff are the time-critical (i.e. essential) shipboard measurements; thus reducing the total scientific workload by decreasing the available equipment does not constitute an option. Based on these considerations and the previous technical staff evaluation, SMP does not modify its recommendation made at the fourth meeting (and presented at the PCOM annual meeting) for increasing the technical staff.

Panel Membership

IHP stole one of our superb panel members, Ian Gibson, and recommended him for chair of their panel. Consequently, ***SMP recommends to PCOM the nomination of an individual to replace Ian.*** The nomination is a person who has an extensive amount of experience in the development of measurement standards and in data/computing methods. This individuals CV will be forwarded to the PCOM chair.

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Information Handling Panel Meeting

18-20 March 1991

Texas A&M University
College Station, Texas

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Attendees: Ted C. Moore, Jr., Michael S. Loughridge, Brian M. Funnell, William R. Riedel, William W. Sager, John B. Saunders, André Schaaf, Henry Spall, Volkhard Spiess, Woody Wise, Patricia Fryer, Ian Gibson, Nick Rock, Michael Hobart, Audrey W. Meyer, and Russell B. Merrill.

RECOMMENDATIONS

Regarding Membership

The Panel nominates Ian Gibson to replace Ted Moore as the Chairman. This selection was based primarily on his extensive knowledge of and experience in dealing with the issues with which IHP (as well as SMP) is constantly faced. (page 1)

The Panel also requests that Ted Moore be asked to stay on the Panel as a regular member.

Because the above changes leave the Panel without a liaison with SMP, it is requested that a new member to fill that position be selected. IHP believes that this person should have extensive knowledge of computer hardware and software, with emphasis placed on his/her experience in a data base production environment.

Integrated Data Analysis

In order to implement the recommendations of the JOIDES workshop on the Integration of Core and Log Data, and at the same time secure against catastrophic breakdown or loss of the shipboard data system under the rapidly expanding load being placed on it, we *urgently* recommend the addition of one additional shipboard systems manager to the staff of each scientific leg. (pages 9, 11)

Additional programming effort will also be required in order to make all data easily portable between data bases and create an early accessible shipboard "working" data base. (page 11)

Other

IHP recommends that the amendments to the BRG data distribution policy presented at this meeting be adopted. (page 1)

IHP recommends a change in policy that will allow manuscripts rejected for publication as scientific papers be considered by the ERB (in altered form) as data reports. (page 5)

IHP recommends that ODP develop a means of easily requesting samples via electronic mail. (page 7)

000194 IHP Meeting
18-20 March 1991

Action Items

Mike Loughridge will write a one-page background letter for the CD-ROM and requesting feedback from users. This will be included in next edition of the disc.

Ted Moore will write a letter to Terence Edgar thanking him for his effort in identifying a problem in the lithology symbols used in site summaries and explaining why it may not be possible to impose standard symbols to be used by every shipboard party to represent various lithologies.

R. Merrill and Chris Mato will get revised cost of doing core curation and reconstruction at the time cores are open for sampling (limit to DSDP cores).

The BRG sent a survey to data requestors aimed at getting their reactions to BRG performance and asking for suggestions to improve response to requests. Mike Hobart will have a report on the results of the survey for the Fall meeting.

All IHP members will provide company names and addresses of typesetting and printing and binding houses that may be interested in bidding for the next contract to provide these services to ODP.

Ted Moore will contact Bruce Malfait about the two projects that IHP wants to have funded using left-over DSDP funds: (a) incorporation of DSDP data that were never collected into the data bases (carbonate, stable isotope, trace element, others that may be identified), and (b) recuration of existing DSDP cores which are badly deteriorating and need "repair."

R. Merrill and Chris Mato will try to implement an electronic mail "forum" for the purpose of requesting samples.

H. Spall, Nick Rock, Ian Gibson, John Saunders, and Bill Riedel form the IHP subcommittee on indexing.

R. Merrill will try to obtain a review by a professional "indexer" of the index of a recent *Scientific Results* volume.

A. Meyer and R. Merrill will explore ways to best create, use and archive a shipboard "working" data base (i.e., one that can be used by shipboard scientists and that can be "corrected" or adjusted by these scientists.)

Information Handling Panel Meeting

18-20 March 1991

Attendees: Ted C. Moore, Jr., Michael S. Loughridge, Brian M. Funnell, William R. Riedel, William W. Sager, John B. Saunders, André Schaaf, Henry Spall, Volkhard Spiess, Woody Wise, Patricia Fryer, Ian Gibson, Nick Rock, Michael Hobart, Audrey W. Meyer, and Russell B. Merrill.

The Panel unanimously nominated Ian Gibson to substitute Ted Moore as the Chairman. His selection was based on his extensive knowledge of and experience in dealing with the issues with which IHP is constantly faced. Should Ian Gibson be unable to serve as the chairman, the Panel selected Will Sager as their alternate nominee.

The Panel also requests that Ted Moore be asked to stay on the Panel as a regular member. He would fill the position left vacant by Ray Ingersoll, who resigned recently.

Should Ian Gibson become Chairman of the Panel, there will be a need for a liaison with the SMP. IHP discussed the importance of filling this position with a person who has extensive experience in computing in a production environment. The need for someone with experience in publications was discussed, but it was noted that this is now being covered by the addition of two co-chiefs on a rotating basis. Kate Moran, Ian Gibson and Michael Loughridge will form a subcommittee to select nominees to fill this position, and the names will be forwarded to PCOM.

Review of Action Items from Previous Meeting

In response to a request from IHP, the Borehole Research Group made changes to the data distribution policy, and Michael Hobart presented the revised document. The changes were approved by IHP, and will be forwarded to PCOM to request adoption of the revised policy.

Several sets of data presented in the DSDP *Initial Reports* volumes are not in an easily accessible data base. Some of those that are in the data bases are not used because they are incomplete. The Panel discussed the need to identify specific deficiencies to make this a comprehensive effort. The data could then be added to the CD ROM. Examples of data that need to be gathered include carbonate, stable isotope and trace element data. Individual investigators have done part of this work in their efforts to conduct their own investigations. In such cases, it would be best to build on their efforts. The Panel agreed to leave further analysis of this task in the hands of those compiling data, such as Yves Lancelot, Terry Edgar, T. Davies and John Saunders.

M. Loughridge suggested that 16 mm microfilm should be considered to preserve paper copies of log data. This would be particularly helpful in the case of FMS data because of their size. M. Hobart added that, in such case, he would recommend keeping data that includes corrections made after the cruise, rather than try to preserve copies of the paper data as they come from the ship.

PCOM and BCOM Meetings

Audrey Meyer presented a report on the PCOM meeting of last November and the recent BCOM meeting.

One of the subjects discussed at the PCOM meeting was a potential US$2.5M fuel cost overrun. In an effort to be prepared to cover these expenses, funds from each of the departments at ODP were held, and expenses were minimized or delayed. However, since the meeting, fuel prices came down. Additionally, the U.S. National Science Foundation provided a fuel supplement. The situation did not have a major impact on the Publications schedule. Some deadlines were relaxed only because of the fear that they would be ready at a time when funds would not be available, but all books were published as soon as they were ready.

At the BCOM meeting, ODP was encouraged not to slow the Publications schedule. The second manuscript coordinator position was approved as part of the base budget. Of $120,000 requested to publish two books more (for a total of 14 books) than covered by the base budget, a US$70,000 increase was approved. The two additional books will be ready as a result of the accelerated Publications schedule that was put in place to reduce the time in production of each volume. The $70,000 approved will not cover publication of both during the fiscal year. By the end of FY 92 two books will be behind (the accelerated) schedule.

BCOM also recommended to discontinue the policy to take 25-cm, whole-round samples onboard the ship and keep them frozen for future organic geochemistry studies. This recommendation was based on the fact that geochemists that used some of the samples found them worthless. This recommendation was communicated to scientists on the ship, and the practice was stopped immediately.

A. Meyer also mentioned the fact that the U.S.S.R. became a member of the IPOD community and that, as such, they will send scientists on each cruise beginning with the upcoming Leg 138.

In general, the BCOM seems inclined to favor projects oriented toward innovation, such as the diamond coring system.

REPORTS FROM ODP

Data Base Group

The report from the Data Base Group (DBG) was distributed to all members of the Panel in preparation for the meeting (Enclosure 1), and A. Meyer presented updates. The Group is now under her supervision at ODP. Three of the four permanent positions that conform the group are vacant, and the fourth, the Data Analyst position, was filled only recently. A. Meyer is conducting interviews and hopes to fill the vacant positions soon. She is looking for an analyst/programmer with some MacIntosh experience to continue development and support of the work started by L. Bernstein on the computerization of barrel sheets and visual core description. The person to fill the data librarian position will probably be the one with the most geology training in the group because this is the person who is in direct contact with the scientists who place requests. Last, the position of supervisor of the group will most likely be given to a person with both, computer science and geology background, and preferably with experience on IBM or compatible systems.

The VCD forms were finished by L. Bernstein before he left ODP. A paper version of the form was sent to Leg 135, and some suggestions for improvement were received from the scientists on that leg. The computerized version will be sent to Leg 138, which will be a major test for this form. W. Autio, a Marine Scientist under Logistics, is putting together a manual on the use of the computerized forms. The form has gone through several reviews, and the Publications group has been involved. T. Moore said that the Panel is concerned about the possible need for a second page to accommodate additional information. A. Meyer said that going into a second page would not only impact the data bases, but also the publications program because of the increased size of the books.

Paleontological data are being entered into CHECKLIST from the *Scientific Results* by graduate students. This is a very time consuming process, which is slowed by training every time a student has to be replaced. A consulting firm was awarded a contract to modify a commercial program (BUGIN) to use it as a paleontological data collection program on the ship. The revised program will probably be ready for use on Leg 138.

A. Meyer also mentioned that the DBG is finalizing checks on the data bases from cruises up to Leg 129 in order to transfer those to NGDC to be used in the preparation of a CD-ROM containing ODP data bases. It will be a prototype to be distributed along with an explanation of the background and a request for feedback. The Panel suggested that this should be explained somewhere in the CD-ROM, and M. Loughridge offered to write a one-page document to this effect. This could be included in the next version of the CD-ROM.

When asked what kind of data checks are performed by the DBG, A. Meyer explained that most checks are performed at data entry. At the end of the leg other checks are performed which consist mostly of correlations to make sure that, for example, the corresponding section and sample for a set of data existed, and that the data are within appropriate ranges. Checks have been added to CORELOG as needs were identified.

When asked if use of data is expected to increase, A. Meyer said that an increase in data requests for preparation of synthesis reports has been observed. M. Loughridge said that new developments at NGDC are headed toward free, on-line access. This allows scientists to exercise data and point out possible problems.

The question of putting data on discs to give to scientists to take home at the end of the cruise was also raised. A. Meyer that it would be very hard to keep the necessary number of diskettes on the ship.

M. Hobart explained that, during Leg 134, efforts were made to put data on line for use from PCs or Macs. This experiment was oriented toward single users. Such data sets as those collected by the FMS would overwhelm any PC or Mac because of their size.

On the ship, S1032 is the data base system being used to collect most data, except for logging data. The S1032 files are stored and brought back to ODP at the end of each leg to be archived. The difficulty with this system is that it is not easily accessible by every scientist. It is being used mostly as a data "stuffing" system, to ensure that data are collected. It is easy to extract ASCII files from S1032, but it would be very time consuming to customize the data output for each individual scientist. Adding tasks to the shipboard systems manager is not feasible given the current load that this person now bears. Instead, ASCII files are generated and put in a central location, and scientists can then pull whatever portions they need to use. Also, in an effort to protect the integrity of the data collected, S1032 is not set up to be accessed and changed by every scientist. Because of this, scientists use and make corrections to the ASCII files generated from 1032. To make sure that corrections are entered into S1032, scientists need to point them out to the system manager. It was suggested that a system should be put in place which allows scientists to make corrections to the ASCII data files before they are loaded into S1032 to be archived. However, handling data as ASCII files can result in very incomplete sets of data. This happened during Leg 130, when some data (but not all information critical to the data base) were collected through a spread sheet program.

T. Moore expressed the Panel's appreciation for the speed with which the group has moved in addressing suggestions by the Panel.

On a related subject, T. Edgar found that the use of symbols for lithostratigraphic columns is very inconsistent throughout the DSDP and ODP publications, even within the same chapter. This was also pointed out by Soviet scientists putting together a series of atlases for lithostratigraphy.

Unfortunately, there is no sure way to impose standards symbols to be used by every shipboard party to represent the various lithologies. After some discussion, the Panel agreed that such was the case. M. Loughridge was asked to write to T. Edgar explaining the situation and thanking him for his effort.

Computer Services Group

The report was distributed prior to the meeting, and J. Foster was available to discuss it at the meeting (Enclosure 2). M. Loughridge said that they have experienced numerous problems with Windows, and asked how the program is performing for ODP. J. Foster said that ODP is using the latest version of Windows running on micronix, 25 mhz machines, and that no major difficulties have been encountered.

On the subject of spreadsheets, I. Gibson supported the move to EXCEL because it is easily transported between Macs and PCs. WINGS was also recommended, and it offers large capacity (near 64,000 rows) for larger spreadsheets. J. Foster said that a few copies of Lotus 1-2-3 are also being kept.

An upgrade to Mantrack was made to allow generation of paper copies of volume status updates to be sent to members of editorial review boards. In the future, ODP hopes to be able to distribute an electronic version of the report.

Work on conversion of the computer user room to a user training room is nearing completion.

A MicroVax 3100 is being set up with a configuration as close as possible to the ship's. This will be used to test software before sending it to be installed on the shipboard systems and to provide a familiar system to scientists who attend post-cruise meetings.

M. Loughridge asked if any system upgrades are planned for the other Vax machines. J. Foster said that this is definitely something to be considered. The cost of maintaining the 750 machines is rising, and the need for more powerful systems is increasing. However, it is important to plan such a move carefully in order to minimize the loss of peripherals. When asked if there is a need to plan to move on to ULTRIX systems, R. Merrill explained that this should not be a problem. Connectivity is possible at the moment, but the VAX systems appear to be better systems in a production environment such as ODP's.

Publications

The report was distributed to members of IHP before the meeting (Enclosure 3), and B. Rose was present to answer questions. T. Moore noted that publication of the *Scientific Results* is staying well below 40 months post cruise in most cases.

T. Moore brought two letters that he received from scientists, and several concerns they expressed were discussed. One of the scientists requested that the manuscript status updates that are now sent to all members of the Editorial Review Board (ERB) for one volume be sent to all scientists that are expected to contribute to that volume. R. Merrill and P. Fryer agreed that this could cause problems because late contributors would relax about submission of their manuscripts when they realized that their manuscripts were not the only ones delayed.

Another concern was that preliminary editorial review checks (PERCs) were being done very thoroughly, but the final manuscript was not being edited. R. Merrill pointed out that the ODP was told to limit editing of *Scientific Results* manuscripts to only those specifically identified by the co-chiefs as needing help. Under this scheme, manuscripts would undergo a PERC upon submission, which would point out areas that needed improvement but would not constitute a thorough edit. The manuscript was then to be left to the author to review. W. Wise noted that with the use of PERCs and a little help from referees, authors were able to turn out manuscripts of very good quality.

With an eye toward speeding the review process, one of the scientists that wrote to T. Moore suggested that manuscripts be sent directly to authors for revision. P. Fryer indicated that, as ERB member, she preferred to receive the reviews before the authors. This allowed her to attach a letter with her summary and comments to the review before forwarding it to the author. For this process to work, however, it is important to send manuscripts as soon as they are received from reviewers. Some members of the Panel wondered whether this would pose a difficulty to the author who would revise his/her manuscript on the basis of the first review only to have to revise it again when the second review is received. This can be avoided if the ERB member reminds the author that another review will be forthcoming. Forwarding the first review immediately will also alert authors to a breakdown of the system if the second review doesn't arrive within a reasonable time.

The requirement to send original art with the initial submission was also questioned. R. Merrill explained that this is the only way that ODP can evaluate the artwork and avoid having to chase missing pieces at the last minute, which could result in additional delays to the volume.

Current ODP policy, as recommended by IHP, states that manuscripts that are not submitted as data reports cannot be turned into such if they do not withstand the peer-review process. P. Fryer said that, in one case, an author prepared a manuscript which contained mostly data and very minor interpretation. Because of the interpretation, it could not be submitted as a data report, and the author didn't want to submit it for peer review because it contained mostly data. The author felt that the manuscript would not be accepted by any science journal for peer review. As a result, the author declined to submit the paper. It was requested that the policy be relaxed, and that individual ERBs should make the decision on whether or not to allow a particular manuscript to be revised and submitted for publication as a data report. The panel agreed to recommend this change in policy.

The tone of the first letter reminding authors about the initial submission deadline was considered too harsh. R. Merrill indicated that this particular communication was being sent as a telex in the past, and that as such the wording had to be different to minimize the cost. The communication is now being sent as a letter, and it has been changed, but cannot be so gentle that it won't stir action.

A failure to communicate final deadline changes was called to ODP's attention. R. Merrill said that ODP was aware of this particular situation. The problem started when two of the ERB members for this volume fell behind in the review process. In an effort to assist them, the manuscript coordinator assumed additional tasks. This consumed much of her time, so she dropped communications with the foreign ERB members. ODP has taken measures to ensure that this does not occur again.

Synthesis manuscripts appear to be missing the volumes for which they are intended. In the majority of cases, co-chiefs are in charge of synthesis papers. It appears that this is because initial submission deadline for synthesis papers usually coincides with the time at which co-chiefs are busiest handling final submission of other manuscripts. P. Fryer solved this by requesting copies of the manuscripts that she needed after they had been reviewed, but before final submission.

Asked about how the two post-cruise meeting scheme was working, R. Merrill replied that it seems to work differently for different shipboard parties. Science meetings (those that take place about 1 yr. post cruise) that are planned around working groups are getting better reviews from the shipboard parties than those organized as mini-symposia. ODP has tried to communicate this to groups planning future meetings, but the format of each meeting is up to each scientific party. Mini post-cruise meetings, intended to finalize the *Initial Reports* volume of the *Proceedings*, also vary in format (about fifteen scientists participated in the last such meeting that took place at ODP).

The time between receipt of reviews by author and the final manuscript submission deadline is three weeks. Some authors feel that this is not enough time, particularly for scientists in Europe whose manuscripts arrive after more than half of the allotted time has elapsed. R. Merrill explained that the short turn-around time is essential to get authors to review their manuscripts quickly. To this date, no manuscripts have been rejected because of failure to meet the deadline. W. Wise suggested that the turn around time start running at receipt of manuscript by the author. The panel felt that a three week deadline for revision after receipt of the reviews was a more reasonable and realistic policy.

It was mentioned that letters of transmittal that are sent with manuscripts are not being passed along to the editors and illustrators. This has resulted in loss of information. R. Merrill said that this may have been overlooked and caused problems, and assured IHP that it will be resolved.

At a previous IHP meeting, it was suggested that the ODP staff scientist should be the main contact between ODP and the other ERB members. Given the number of staff scientists at ODP at the moment, the initial deadline comes at the time that the staff scientist is expected to sail again. Therefore, this idea cannot be implemented unless the number of staff scientists at ODP is increased. A request was made to do so, but it was not approved, and the suggestion cannot be implemented.

The Panel also wanted to know how the dual submission process is proceeding. ODP has received about four or five manuscripts submitted under this scheme. It appears as if the initial upbeat response by editors of science journals is no longer there. Furthermore, editors at science journals change, and responses from new editors are unpredictable. In one instance, an ODP scientist was forced to submit a token paper to the *Proceedings* volume and the complete manuscript to the outside journal. It appears that this is partly because scientists may not understand the policy. R. Merrill suggested that ODP continue to handle each manuscript individually. ODP Publications is prepared to help scientists write letters to editors of outside journals explaining the system, and has already done so in some cases. Additionally, timeliness was the main reason why scientists wanted to publish outside of ODP. The fact that the ODP publication schedule was accelerated means that, in quite a few cases, the ODP volume will be ready before the outside publication.

At a previous meeting, IHP recommended that the co-chiefs indicate which paper would fulfill each scientist's responsibility to publish with ODP. W. Wise stressed that this is very important because it allows co-chiefs to plan the volume, knowing beforehand which topics will or will not be covered. B. Rose said that the need is being emphasized to co-chiefs before and after each cruise, but ODP has not had enough time to evaluate how this is working.

R. Merrill informed the Panel that ODP has negotiated an agreement with EOS whereby EOS will publish ODP reports at the end of each leg. These can include up to 1,000 words and up to four figures. The publication of this report would replace the Geotimes articles.

I. Gibson (and W. Riedel) asked about how the index to the *Proceedings* volumes can be improved. He stressed that the index will control scientists' ability to locate information in the books, particularly in the long term. He suggested that a copy of the index should be sent to a professional indexer for review, and that, if found lacking, redoing the index should be considered. B. Rose explained that the indexing subcontractor is making an effort to follow the GeoRef format. H. Spall talked with the person in charge of GeoRef at the AGI. He explained that GeoRef is not equipped to build an index to subjects; they only index to chapter level. In order to build an index for the ODP volumes, they would have to develop a special program, and they do not have the manpower to do so. After some discussion, the Panel agreed to leave the subject in the hands of a subcommittee headed by H. Spall and including J. Saunders, N. Rock, I. Gibson and W. Riedel.

Curation Report

C. Mato was available to discuss the report (Enclosure 4) that was distributed to IHP before the meeting. She pointed out that there has been a 42% increase in sampling over DSDP.

A project to re-curate cores was presented. M. Loughridge asked whether this is an ongoing project and if the total cost is known. C. Mato replied that recuration will include stabilization of the core, and should be a one-time effort. Once this has been achieved, maintenance will continue. Most problems with integrity of the cores are caused by sampling on the ship. Different scientists sample differently, and in some cases this results in badly damaged cores by the time they reach the repositories.

Two ways to accomplish this project were suggested: (1) to hire additional personnel to recurate cores as they are open for sampling and (2) to try to accomplish recuration with existing personnel, at the expense of increasing turn-around time for responding to sample requests. The panel agreed that it was necessary to give the project a high enough priority so that it would be accomplished, but that it may be best to do the work as cores are open for sampling. It was also suggested that the project should be limited to DSDP cores. This would in effect lower and spread the cost over a longer period. C. Mato and R. Merrill will revise the cost of accomplishing the work on these terms.

It was suggested that an electronic mail form should be made available for sample requests. This form could then be used to get the information into the data base, thereby reducing the workload at the repositories. R. Merrill said that he believes it is possible to accomplish this with a minimum effort (and he will investigate the possibility).

The geriatric core study is proceeding slowly. Cores have been collected from three legs. Paleontological samples were sent to Dr. Enriquetta Barrera and ODP is waiting for her report. J. Gieskes has already submitted a report. Investigators working on this project are doing so using their own time and supplies. At this time, most of the information gathered is raw data, and the effort to interpret them is very small.

A question was raised about curated depths. This brought out the issue of which depth, and the discussion in Basel about logging depths vs. curated depths. Asked which is being kept by ODP, R. Merrill said that the curated depths is what is being kept and that those are not changed. It was suggested that an additional data base could be created to hold only corrections made to the curated depth that is being kept now. A. Meyer explained that constructing the data base would not be a problem, but that the question to be addressed is how to use this data base. The subject will discussed further at the joint meeting with the SMP.

Logging Group Report

M. Loughridge presented the report at the meeting (Enclosure 5). He pointed out that the Borehole Research Group (BRG) received an erasable optical disc, which will provide more space for storage. It will also make fulfillment of requests easier, because data can be sent in various formats. They are looking at different ways to distribute data. ASCII files are easily transportable, but take up more room.

FMS data are being processed on the ship, with the assistance of an ODP technician. Final images are still processed at Lamont, where the necessary equipment is available. On the ship, data are now transferrable to the VAX, where it can be sampled via the VAX server. It can then be downloaded to Macs and/or PCs and used with other programs to produce figures, an example of which is presented at the back of the report. They will need input on the format for output of logging data.

T. Moore asked if scientists can get a complete set of data in Terralog. M. Hobart replied that it is possible to provide it upon request. W. Wise wanted to know if there is an interest in logging data from sedimentologists and paleontologists. M. Hobart said that the interest is definitely high and rising, particularly due to the amazing results of correlations.

In an effort to find ways to improve response to requestors, the BRG sent out a survey. About 35 replies have been received during the last two weeks. A report detailing the results of the survey will be prepared by M. Hobart for the Fall meeting of the IHP.

The possibility of using CD-ROM for data distribution was discussed. M. Loughridge explained that, at this time, there is a package available that allows use of LIS data, which is the format that was used to store the DSDP data on the CD-ROM. However, he believes that tapes will remain the prevalent media for data distribution for a while, and that CD-ROMs will continue to be used as a means for archival of data for the moment. The National Media Laboratory set up a group to look at long-term archival needs. They offered to evaluate the environment of the spaces where NGDC keeps their records. They recommended that NGDC should move all data to square cartridges, and that they move away from optical systems. Some problems have come up with the plastic used in optical technology, and the software is not being maintained. NGDC is in the process of moving all data to square tape cartridges.

M. Loughridge also pointed out that data dissemination is now also being accomplished via networks, and that this method will become more widespread. One advantage is that by transferring data via networks the limitations of computer capacity are eliminated.

Paleontological Reference Centers Report

J. Saunders prepared a report on the activities of the Centers (Enclosure 6).

AMOCO offered to prepare the palynological samples, and they would like more information on the amount of materials that they can expect to come (not many more than 1,000).

The proposal from A. Sanfilippo to prepare radiolaria samples was selected.

W. Riedel forwarded a proposal to E. Kappel requesting funding for a workshop on curation and data base management for the Reference Centers. He has not received a response. J. Saunders would prefer to hold the workshop around the Spring of 1992. He and W. Riedel will continue work on this project.

Asked about usage statistics, J. Saunders said that he has been trying to get information from the other Centers. He has statistics for the center in Basel. Based on those, he can say that use of the Centers, at least within Europe, is growing. The style of use is also broadening, and repeated visits by one scientist have taken place. He hopes to get a better response from the other Centers in order to have a report on usage ready for the Fall meeting.

Ship's Data Bases

W. Sager prepared a report from Leg 135 (Enclosure 7). He concluded that there appears to be more to do onboard than people to do it. This is worsened by the learning curve on some of the software, which is more than desirable. He believes that the Panel should decide which minimum sets of data have to be collected by each shipboard party. After that, each shipboard party would then be responsible for deciding how much interpretation of these data is needed for the *Initial Reports*. Some interpretation is unavoidable; it is required for biostratigraphy, physical properties, VCD descriptions. However, it is not uncommon for scientists to get involved in the preparation of very complex figures. These are very time-consuming tasks which help science, but are not necessary for data collection. The Panel should also decide how much effort should be devoted by personnel on the ship to support "additional" science (that is, science in addition to that necessary for production of the *Initial Reports*). Expectations also need to be defined in terms of quality.

R. Merrill said that the above are all addressed at the time of the pre-cruise meeting. Additionally, obligations of the scientists are defined for each position. The latter cannot be made more specific because of the different requirements for each leg.

Asked about whether there have been cases where omissions in data collection have come up, A. Meyer responded that none have. The main problem seems to be on the side of not making intelligent choices on what data are being collected. This is an issue that needs to be addressed and tempered by the co-chiefs.

The amount of artwork produced for each *Initial Reports* volume has also increased considerably. This appears to have been spurred by the addition of MacIntoshes. It is having a serious impact not only on the workload of scientists on the cruise, but also on the cost of printing the increased number of pages. W. Wise suggested that it should be stressed to co-chiefs that decisions on doing very time consuming artwork should be based on its usefulness to the rest of the scientific party.

A complaint often voiced is that there are many programs for which there is no adequate documentation. R. Merrill said that most likely these are programs brought along by scientists and left on the machines. The system manager tries to eliminate copies of those that are not supported and that were copied illegally, but the problem persists.

T. Moore asked if there is a standard set of data available to scientists on the ship. R. Merrill explained that all data collected are available. They can be easily dumped. Additional and cumbersome work is incurred when various scientists want data dumped to their individual specifications. Additionally, depths are collected by various tools, and the values returned do not necessarily match.

Additional discussion centered around which set of data should be kept: raw data (which is what is being collected now), modified data, or both. In general, opening the S1032 data bases to handling by all scientists was not considered a desirable alternative. It was also suggested that data could be dumped into ASCII files, which could then be modified by the scientists. At the end of the cruise, these could be loaded into S1032 and brought back along with the raw (also S1032) data files. The problem with this process is that, after they are massaged, the ASCII data files may not fit the specifications to make it possible to load them back into S1032. These specifications were set up to preserve data continuity. If keeping both, which would be used to fill requests?

It was also noted that some of the largest sets of data don't ever get into S1032 (for example, logging data which are very large and would overwhelm almost any system).

If data are modified and kept instead of raw data, it will be imperative that all corrections to the raw data be documented. Documentation would have to include not only each change, but also the reason for making the change.

A. Meyer and R. Merrill offered to devise a solution to this question.

The Panel came back to the discussion of which project should be of higher priority: gathering data from the DSDP books and their incorporation into a data base or the core re-curation program.

W. Riedel proposed to assign data gathering a higher priority. He realizes that some of the most useful data are not available electronically. In order to gather these data, the project needs to be defined more carefully. Who will do the work? How will it be delivered, in paper or electronic form? Three sets of data that need to be gathered have been identified: stable isotope, carbonate and trace element data. ODP is responsible for collection of data published in the *Scientific Results*, but not much has been done to this point. Efforts in this area have been hampered because ODP has been trying to get the information from the scientists on disc, but has not received a good response.

Can the DSDP data be put in a CD-ROM such as that containing ODP data? M. Loughridge explained that the DSDP data are not in a flatfile, and do not resemble ODP data in format. If put on a CD-ROM, this would create a requirement for customized retrieval software. R. Merrill suggested that it may be possible to make DSDP data "looklike" ODP data. If that is the case, the commercial software being used to retrieve ODP data could be used for both. The ability to use the same retrieval system for both sets of data is a strong point, particularly if commercial software can be used. Usage would definitely increase.

The Panel reached the conclusion that it would be good to try to accomplish both of the above mentioned projects. T. Moore will communicate this conclusion to Bruce Malfait. He will ask how B. Malfait feels about using left-over DSDP funds to this effect.

Demonstration of CD-ROM

M. Loughridge distributed a handout to be perused before the demonstration. He explained that there are two parts to the CD-ROM: the one with DSDP data includes the cumulative index, and the print run will number 2500. These will be sent free of charge to those on the DSDP *Initial Reports* and ODP *Proceedings* distribution lists. Only 500 copies were made of the test version of the CD-ROM with ODP data. The latter also includes a sample chapter from a recent ODP *Proceedings* volume.

N. Rock asked if CD-ROM would be a viable alternative to publish the *Initial Reports* volumes, eliminating printing of paper copies. This would alleviate the budget difficulties imposed by the increasing number of pages to be printed. Most panel members, however, pointed out that paper copies are needed to make the information available to a large scientific community. At the moment, access to CD-ROM technology is even more limited than access to microfiche. Instead, it was suggested that a limit be placed on the number of pages that can be published in any particular volume. This would create a completely different set of problems, with different legs having different requirements. Limits would be impossible to apply to legs that have large recovery rates, for example. Applying limits would also have the effect of reducing storage needs. R. Merrill suggested that at this time ODP Publications is coping with the situation, and that there is not a need to try to change the Program or impose limits on the number of pages that can be printed.

Joint Meeting of SMP and IHP

K. Moran gave a presentation on the items that were considered high priority: (1) integration of data obtained from core and logs, which is critical to presenting results; (2) data handling on the ship; (3) new format for barrel sheets; (4) system units, and (5) smear slides.

After this presentation, B. Meyer reviewed the results of an attempt to accomplish data integration onboard the ship during Leg 134. He stressed that the experiment highlighted several difficulties in accomplishing this objective. These include:

- The necessary tools to achieve integration are not available on the ship. Very powerful PC or MacIntosh machines would be needed to accommodate large amounts of data. Additional customized software would have to be developed to handle routine tasks. All corrections to data would need to be documented. During the 134 experiment, data had to be decimated in order for it to fit.

- In addition to preparing the necessary ASCII data bases for scientists, routine system maintenance procedures would put excessive demands on systems' manager time, who is already working more than the standard 12-hour shifts.
- The scientists are not capable of undertaking this additional chore either. They would have to learn what happens "behind the scenes" with the work they do (stored into a data base).
- Logging data is not available to be incorporated into an "integrated" scheme until the hole is finished.

IHP and SMP concluded (see Enclosure 8) that it is important to have a system on the ship that allows scientists to achieve correlation of core and logging data in real time. To be able to achieve this, another shipboard computer system manager will need to be added to each leg to make it possible to extract the required information from the data archival systems and continue to maintain the system.

Second, additional support is needed to develop the programs needed to extract the data from the data archival systems and to create a second "scientific" data base. This would make it possible to keep the raw data untouched, without risking its loss. Data that has been accessed and modified by the scientists would be kept in the "scientific" data base. On this basis, IHP endorsed the request by the SMP that the following personnel be added to the Program:

1) An additional system manager to sail on each leg (two seagoing, rotating positions). This would be a permanent addition.
2) A programmer, to develop the necessary software. Position to be added only to accomplish the task.
3) A scientist to make corrections to data during the cruise. This task could be performed by a graduate student that would sail as a member of the shipboard party on each leg.

SMP and IHP also discussed presentation of logging and MST data along barrel sheets in the *Initial Reports* volumes. A. Meyer said that ODP is looking forward to presenting this information in that format. The computerized barrel sheet and VCD systems now make it easy to draw to a very small scale. While drawing, data are going into a data base in the background. These data could be made available to requestors at the end of the cruise. The main problem presented by the format recommended by SMP is that it would create a lack of continuity in the data bases. It would also be difficult to enforce the use of the standard units in Publications. The only way would be to return manuscripts to authors who are not using them.

After these two presentations, the panel attended demonstrations of the visual core description system, the new CD-ROM and data base retrieval software, and a CD-ROM journal publication scheme.

Non-Performers

The Panel assigned a subcommittee to review the cases of potential non-performers. The subcommittee reported back with recommendations on the actions to be taken in each case. T. Moore will draft letters that will be sent to J. Austin, PCOM chairman, to be sent to the individual scientists.

After the review of potential non-performers, the Panel met in closed session and discussed the recommendations presented in the executive summary.

000207

DRAFT

JOIDES SITE SURVEY PANEL MINUTES

March 26-28, 1991

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Ans'd............

Ocean Drilling Program
Texas A&M University, College Station, Texas

Members:

Kidd, Rob (University of Wales, Cardiff, UK) Chairman
Farre, John (EXXON, USA)
Hirata, Naoshi (Chiba University, Japan)
Kastens, Kim (LDGO, USA)
Larsen, Birger (Geological Survey of Denmark, ESF)
Lewis, Steve (USGS, Menlo Park, USA)
Larsen, Birger (Geological Survey of Denmark, ESF)
Meyer, Heinrich (BGR, Germany)
Moore, Greg (HIG, USA)
Pautot, Guy (IFREMER, France)
Von Herzen, Dick (WHOI, USA)

Liaisons:

Blum, Peter (JOIDES Office, UT)
Brenner, Carl (Site Survey Data Bank, LDGO)
Garrison, Lou (PPSP)
Meyer, Audrey (ODP/TAMU)
Watkins, Joel (PCOM)

Guest:

Francis, Tim (ODP/TAMU)

Apologies:

Trehu, Ann (Oregon State University)
Ball, Mahlon (PPSP)
Moran, Kate (SMP)

000208

SITE SURVEY PANEL EXECUTIVE SUMMARY
ODP/TAMU, March 26-28, 1991

The College Station Site Survey Panel Meeting was concerned with considering the final status of the site survey packages for the FY'92 drilling, now set for Pacific programs by PCOM at its Hawaii meeting, and then with moving on to initial assessments of the presently highest-ranked Atlantic proposals by SSP's assigned "watchdogs". We also set in place procedures for handling the new S-proposals and tightened up our communications to handle our new phase of Atlantic assessments.

SSP Consensus 1: SSP will make its evaluations of S-proposals based on positive recommendations for drilling by one or more thematic panels. S-proposals will be mailed to all SSP members. Only those S-proposals favoured during the thematic panel review stage will be considered in SSP mail review. SSP Chairman will report the Panel's evaluation to the JOIDES Office after contacting members with appropriate expertise to the proposal.The following schedule is recommended:

S-proposals accepted by JO until	June 1
Thematic panel reviews back to JO by	July 1
SSP reviews back to JO by	August 1

SSP Consensus 2: SSP 'watchdogs' on North Atlantic proposals will not take action in contacting proponents on decisions made at this meeting until JOIDES Office (Blum) distributes the results of PCOM's April global ranking '91.

SSP Consensus 3: The Data Bank should proceed with the program of digitizing its card catalogue. The possible advertisement and distribution of the results to the general JOIDES community will be discussed again when the task is completed.

SSP Consensus 4: SSP reiterates the concerns it has expressed over the quality of seismic data at sites in the Cretaceous Guyots component of the Atolls and Guyots program that have basement objectives. The Panel requests that the DPG examine whether these objectives might be met at other guyots where the seismic data is of better quality.

SSP Consensus 5: Provided that the additional Detroit Seamount site is selected within the 2400-3000 m depth interval in the seismic data grid of the Washington and Farnella seismic lines, the critical data for the North Pacific Transect are in hand. The seismic reflection data are poor for a number of sites, but are still judged as sufficient for the drilling objectives as long as high-quality seismics are run by the drillship on arrival and departure of the sites.

SSP Consensus 6: SSP reiterates its concerns that additional geophysical data is needed at Hess Deep, primarily detailed MCS data to characterise regional crustal structure and deep-towed seismics and sidescan to image possible rubble. The Panel notes that, even for the currently-envisaged single-site petrologic objectives, no survey package is yet available for

assessment and reiterates its recommendation that this exciting science be drilled late in the FY'92 program.

<u>SSP Consensus 7:</u> One operational concern that needs prompt attention from the TAMU engineering staff (in the light of proposals with sea-level objectives on Atlantic margins) is shallow-water drilling. The New Jersey proposal, for example, includes sites (albeit lowest priority) in water as shallow as 20m, and is vitally dependent on successful drilling in water as shallow as 60m.

<u>SSP Consensus 8:</u> SSP considers that it is too early to make major changes in its guidelines, in particular for BSR and FZ drilling. It will, however, provide JOIDES Office with some minor modifications prior to publication of the revised 'Guidelines to Proponents'.

000210

SITE SURVEY PANEL AGENDA
ODP/TAMU, March 26-28, 1991

1. PRELIMINARY MATTERS

   1. Introduction (Kidd)
   2. Logistics (A. Meyer)
   3. Review of LDGO Meeting
   4. Updated Ship Schedules
   5. Other Business for Agenda

2. REPORTS

   1. PCOM (Watkins)
   2. JOIDES (Blum)
   3. TAMU (A. Meyer)
   4. PANCHM (Kidd)
   5. PPSP (Garrison)
   6. DATA BANK (Brenner)
   7. SEA LEVEL WG (Watkins)
   8. DPG's:
      North Atlantic Rifted Margins (Blum)
      North Atlantic Arctic Gateways (Larsen)
      Atolls & Guyots (Watkins)

3. SCHEDULED LEGS - FY '92

   1. East Pacific Rise (Lewis)
   2. Sedimented Ridges (Louden)
   3. Chile Triple Junction (Lewis)
   4. Atolls & Guyots (Kidd)
   5. North Pacific Neogene (Larsen)
   6. Hess Deep (Kidd)
   7. Cascadia (Louden)

4. STATUS OF NORTH ATLANTIC PROGRAMS

   1. NORTH ATLANTIC RIFTED MARGINS DPG PROGRAMS [LEWIS]

      1. 310 — Geochemical Sampling of Dipping Reflector Sequences (previously Kidd)
      2. 358 — Sedimentary Equivalent of Dipping Reflector Sequences (previously H. Meyer)
      3. 365Rev — Conjugate Passive Margins, North Atlantic (previously Louden)

2. NORTH ATLANTIC ARCTIC GATEWAYS DPG PROGRAMS [LARSEN]

1. 305 Arctic Ocean Drilling (Larsen)
2. 320 Paleoceanography and paleoclimatology, Nordic Seas (Larsen)
3. 336 Arctic to North Atlantic Gateways (Larsen)

3. OTHER NORTH ATLANTIC PROGRAMS

1. 361Rev Hydrothermal System, TAG Area (von Herzen)
2. 369 Deep Mantle Section, MARK Area (Hirata)
3. 348 Paleogene/Neogene Stratigraphy, New Jersey Margin (Kastens)
4. 313 Major Oceanographic Pathway, Equatorial Atlantic (Pautot)
5. 333 Evolution of Pull-Apart Basin, Cayman Trough (Lewis)
6. 346Rev Drilling Equatorial Atlantic Transform Margin (Pautot)
7. 347 Late Cenozoic Paleoceanography, South Equatorial Atlantic (Farre)
8. 376 Layer 2/3 and Crust/Mantle Boundaries, Vema Fracture Zone (Hirata)
9. 378Rev Growth and Fluid Evolution, Barbados Accretionary Wedge (Moore)
10. 323Rev Alboran Basin and Atlantic-Mediterranean Gateway (Kastens)
12. 343 Window of Cretaceous Volcanic Formation, Caribbean Zone (Farre)
13. 345 and 345 Add. Sea Level and Paleoclimate, West Florida Margin (Moore)
14. 372 Cenozoic Circulation & Chemical Gradients (Larsen)

5. "ADD-ON" SCIENCE PROPOSALS (Kidd/Brenner)

6. RECOMMENDATIONS FOR REVISION OF SSP GUIDELINES

1. BSR Drilling (Garrison/Francis)
2. Fracture Zone Drilling (Von Herzen/Kastens)
3. Others

7. OTHER BUSINESS

1. Feedback to Proponents (Blum/Kidd)
2. E-Mail communications
3. Panel Membership (Kidd)
4. Next Meeting

000212

SSP ACTION ITEMS

March 26-28, 1991
College Station, Texas

SSP Action Item 1 (Blum): JOIDES Office is asked to routinely send copies of revised active proposals to SSP watchdogs

SSP Action Item 2 (Blum): JOIDES Office is asked to replace the newly-added checkboxes "mature/immature" of the draft Thematic Panel review form (PRF) by a reference to SSP guidelines. Thematic panel members might not be familiar enough with the SSP guidelines, and it is not the mandate of the thematic panels to evaluate survey maturity of proposals.

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SSP Action Item 4 (Lewis/Larsen): Revisions by DPG's of proposals into Programs have lead to consolidation of "watchdog" assignments by SSP. Lewis will take over as watchdog for the North Atlantic Rifted Margin Program and Larsen will handle the North Atlantic-Arctic Gateways Program

SSP Action Item 5: (Kidd): SSP Chairman will respond to proponent Piper's enquiry regarding the Navy Fan S-proposal noting that the intention is for 4 days of drilling maximum for supplemental science and suggesting he take action to obtain better quality seismic data.

SSP Action Item 6 (Kastens/Kidd): A revised version of the SSP Matrix of Data Requirements will be circulated by Kastens. SSP members will contact Kidd with any changes. Kidd will send the final version to Blum by 1 May.

SSP Action Item 7 (All SSP Members): The Panel will begin to communicate by E-Mail through a central Data Bank 'Mailbox'. Each will send an initial message to Carl Brenner using the following:

ODP@LAMONT.LDGO.COLUMBIA.EDU.

SSP Action Item 8 (Kidd): Chairman is to write to J. Austin requesting that the next *SSP Meeting* be held at *ORI, Tokyo* over three days: *September 3-5, 1991*, hosted by *Hirata*. The prime agenda items will be detailed assessment of N. Atlantic data sets in the light of the new PCOM global rankings.

1. PRELIMINARY MATTERS

1. Introduction Chairman Rob Kidd welcomed the Site Survey Panel to ODP/TAMU as the meeting began at 0840. He thanked Mrs Linda Storms and Audrey Meyer for their efforts in making the meeting arrangements at short notice when it became clear that SSP would not be able to meet in Tokyo as previously scheduled. Chairman welcomed Dr John Farre, the new US industry member on SSP from EXXON Houston. He noted that Dr Anne Trehu of OSU was now expected to attend the next SSP meeting. He accepted apologies from PPSP liaison Ball and SMP liaison Moran and explained that Lou Garrison would be attending in place of Mahlon Ball but he also noted that Tim Francis would be attending the first day 'in lieu of Lou'. A message was received that Keith Louden's arrival would be delayed probably to Day 2.

Chairman outlined the business to be covered at the College Station meeting, most importantly a review of the survey status of North Atlantic Programs in the light of recent DPG and WG meetings. He cautioned that SSP would probably have to review the assignments of proposals to "watchdogs"now that some proposals had been merged into programs by the DPG's.

2. Logistics. Audrey Meyer explained the logistical arrangements for the three days of the meeting, including meals and the availability of a tour of the ODP facility for members and liaisons who had not visited College Station previously.

3. Review of LDGO Meeting. Minutes changes and matters arising:
Chairman called for any changes required to the minutes of the LDGO meeting of SSP in July 1990. There were none and it was agreed that there were no matters arising that were not already on this meeting's agenda.

4. Updated Ship Schedules. New ship schedules were received from the Japanese, German and Canadian representatives, which appear as SSP Appendix 1.

5. Other business. No additional items were requested for this agenda.

2. REPORTS

1. PCOM (Watkins)

PCOM met in Hawaii, November 28 - December 1, 1990. The principal results of the meeting were as follows:

- USSR has joined ODP
- DCS testing has identified new problems and delays. As a result, the Sedimented Ridges II and Cascadia II objectives cannot be met during the current planning period.
- The new drilling schedule includes:
  - 504B
  - Chile Triple Junction
  - EPR
  - Atolls and Guyots (2 legs)
  - North Pacific Transect
  - Cascadia
  - Hess Deep
  - Engineering Leg 4

A number of SSP members expressed surprise at PCOM's action on Hess Deep in the light of SSP's recommendations on its data set. There was more concern at the options in the operations schedule for FY92 that could involve drilling at Hess Deep on Leg 140 before any significant work could be done on the site survey package. Kidd, who was present for the PCOM discussions, reported that PCOM viewed this drilling as non-regional and not requiring the seismic coverage that SSP had recommended. It was agreed that an adequate site survey package would still be required and no time was allowed for this. The Panel would return to the Hess Deep item on Day 2.

PCOM agreed that Supplemental ("add-on") Science will be accommodated on an ad hoc basis, not to exceed 4 days per leg and 10 days in each fiscal year of drilling. "Supplemental science" is defined as high priority science that requires much less than a full leg and that can be addressed within the planned ship's track. PANCM had recommended ways of reviewing the proposals recognising that the procedures would impact SSP and PPSP activities greatest. (This item is addressed in Kidd's PANCHM report and later in the agenda).

PCOM established an Atolls and Guyots Working Group to recommend a program for the planned 2 legs and a Sea Level Working Group to set objectives for future drilling for sea level objectives.

2. JOIDES (Blum)

1. Proposal administration The recent process of setting up a database for proposal and other affairs of the JOIDES Office, and also changes in the JOIDES planning procedures, led to the modification of the proposal numbering systems. In particular ocean indices (A, B, ...) previously attached to the three digit numbers are omitted now. A detailed explanation was handed out (SSP Appendix 2). Some SSP members asked for clarification on how revised proposals were to be handled by the JOIDES Office and there was discussion of how SSP watchdogs were to receive revisions.

SSP Action Item 1 (Blum): JOIDES Office is asked to routinely send copies of revised active proposals to SSP watchdogs.

A modified proposal log sheet including thematic objective and site summaries was also presented and SSP members were asked for feedback on the usefulness of such a one sheet proposal summary for panel business and communication purposes.

The proposal review form (PRF), designed to communicate thematic panel reviews to proponents, and modified after discussions at the Panel Chairpersons meeting in Kailua-Kona, Nov 30 1990, was presented and discussed. It was agreed that references to maturity of proposals were likely to cause confusion and the pertinent reference should be to the survey maturity of proposals.

SSP Action Item 2 (Blum): JOIDES Office is asked to replace the newly added checkboxes "mature/immature" of the draft Thematic Panel review form (PRF) by a reference to SSP guidelines. Thematic panel members might not be familiar enough with the SSP guidelines, and it is not the mandate of the thematic panels to evaluate survey maturity of proposals.

A number of SSP members considered that the draft PRF form might be improved by reversing the order of the panel evaluation boxes to present a more positive aspect.

SSP Action Item 3 (Blum): SSP asks the JOIDES Office to include SSP guidelines, or reference to them, with acknowledgement letters for new proposals.

Note that modified SSP guidelines will be forwarded to the JOIDES Office in near future (see later discussion) to be included in the revised guidelines for proposal submission mentioned by Blum as being prepared for publication in the JOIDES Journal.

A list of proposal received by the JOIDES Office since July 1990 was distributed to the SSP members (SSP Appendix 3).

2. Supplemental Science Proposals (S-proposals) SSP was reminded that S-proposals for the scheduled Pacific legs received by the JOIDES Office between mid-February and June 1, 1991 (deadline) need to be mail-reviewed by thematic panels as well as SSP and PPSP. Thematic, site survey and safety reviews will be included in the PCOM agenda book for the August 22-24 PCOM meeting, where the decisions on supplemental science insertions will be made. SSP discussed the implications and timing of this procedure.

SSP Consensus 1: SSP will make its evaluations of S-proposals based on positive recommendations for drilling by one or more thematic panels. S-proposals will be mailed to all SSP members. Only those S-proposals favoured during the thematic panel review stage will be considered in SSP mail review. SSP Chairman will report the Panel's evaluation to the JOIDES Office after contacting members with appropriate expertise to the proposal.The following schedule is recommended:

S-proposals accepted by JO until	June 1
Thematic panel reviews back to JO by	July 1
SSP reviews back to JO by	August 1

3. Assessment of Atlantic proposals All active Atlantic/Mediterranean proposals were presented in a list subdivided according to the global ranking priorities set by the thematic panels during their spring 1990 sessions (Appendix 4). The 1-5 priority proposals of each panel were further subdivided into those forwarded to the North Atlantic Rifted Margins Detailed Planning Group (NARM-DPG), those forwarded to the North Atlantic - Arctic Gateways Detailed Planning Group (NAAG-DPG), and others. Because DPG reports will finally replace original proposals, re-assignments of SSP watchdogs was facilitated by this subdivision.

SSP Action Item 4 (Lewis/Larsen): Revisions by DPG's of proposals into Programs have lead to consolidation of "watchdog" assignments by SSP. Lewis will take over as watchdog for the North Atlantic Rifted Margin Program and Larsen will handle the North Atlantic-Arctic Gateways Program.

Atlantic proposals highly ranked last spring are likely to be highly ranked at the present global ranking, the result of which will be summarized and illustrated for the agenda book for the April PCOM meeting in Narragansett, Rhode Island. New proposals (last group on the list) may eventually occupy high ranks also.

SSP Consensus 2: SSP 'watchdogs' on North Atlantic proposals will not take action in contacting proponents on decisions made at this meeting until JOIDES Office (Blum) distributes the results of PCOM's April global ranking '91.

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3. TAMU (A. Meyer)

1. New cruise schedule. Based on deliberations at the PCOM November 1990 meeting, a schedule of ODP cruises in the Pacific Ocean through January 1993 was compiled (see SSP Appendix 5). The decision about whether Leg 140 will deepen Hole 504B or drill in Hess Deep will be made after attempts at cleaning Hole 504B during Leg 137 are completed. Drilling plans and strategies for Legs 143 and 144 (Atolls and Guyots A & B) were prepared at the Atolls and Guyots Detailed Planning Group (February 27-28; Ann Arbor, Michigan), and will be discussed at the upcoming April PCOM meeting. OHP discussed and prioritized drilling targets for the North Pacific Transect (Leg 145) at their recent meeting (February 28-March 2; Chapel Hill, N.C.). If Hess Deep is not drilled during Leg 140, it will be drilled during Leg 147.

Leg 137 is the cruise currently underway; *JOIDES Resolution* is now in transit from Honolulu to the Costa Rica Rift region to begin fishing/milling operations at Hole 504B. Leg 136 recently ended in Honolulu (March 20), after successfully establishing a cased reentry hole at proposed site OSN-1 (Hole 843B) for Ocean Seismic Network pilot studies. A prototype "cork" was successfully tested in the reentry cone.

None of the recent ODP cruises for which SSP/PPSP had safety concerns (i.e., Leg 133/NE Australia and Leg 135/Lau Basin) experienced any hydrocarbon problems. In conjunction with PPSP, ODP is developing extensive safety procedures and precautions for dealing with potential H_2S and high-temperature safety problems on Leg 139 (Sedimented Ridges I).

Leg 133 (NE Australia) proved to be a record-breaking cruise in many regards; numbers of sites, holes and cores; total penetration and recovery.

2. Scientific staffing update. The Soviet Union has signed the MOU to join ODP, and their membership will be effective in May, 1991. Scientific staffing is complete through Leg 139, except for the addition of 2 Soviet scientists on each of Legs 138 and 139. Staffing of the shipboard scientific parties for Legs 140-142 is currently underway.

Co-Chief Scientists for future ODP cruises are as follows: Leg 140--Henry Dick (Woods Hole Oceanographic Institution) and Jorg Erzinger (Univ. Giessen, F.R.G.); Leg 141--Steve Lewis (U.S. Geological Survey) and Jan Behrmann (Univ. Giessen, F.R.G.); Leg 142--Rodey Batiza (Univ. Hawaii). Co-Chiefs for Legs 143-146 will be invited following the April PCOM meeting.

3. Publications update. ODP Publications published a record 20 volumes (16722 pages!) during FY90, as part of their ongoing efforts to speed up publications of the *Initial Reports* and *Scientific Results* volumes. Publication schedules have now been reduced to ~12 months post-cruise for the *Initial Reports* volumes, and ~36 months post-cruise for the *Scientific Results* volumes. Fourteen volumes are currently scheduled for publication during this fiscal year. There has been a trend toward larger *Initial Reports* volumes since ODP began, related to increased core recovery and increasing use of Macintosh graphic capabilities onboard ship; this trend results in increased publications costs.

4. Budget Committee update. BCOM met in Washington, D.C. on March 14-16 to discuss ODP budgets for FY92. NSF gave JOI a target budget level of $41.4 M, and BCOM made recommendations to ODP/TAMU, LDGO/BRG, JOI, and JOIDES to successfully meet this level. In addition, BCOM is recommending that NSF identify an additional ~$1M to support technological developments critical for furthering JOIDES and COSOD scientific goals.

5. EOS to publish cruise results. Beginning with Leg 136 (OSN-1), EOS will routinely publish papers on ODP cruise results. This is in addition to articles that are currently published in Geotimes and Nature. EOS will also publish calls for S- proposals when FY drilling programs are set.

4. PANCHM (Kidd)

The JOIDES Panel Chairmen met in Hawaii prior to the end of year PCOM meeting and then took part in the PCOM meeting itself. SSP Chairman Kidd had chaired PANCHM and reported on its concerns and recommendations to PCOM. For a number of these items Kidd was able to provide updates because of subsequent action by PCOM.

Panel Chairmen were concerned with:

- improving the advertising of upcoming ODP activities to the general scientific community (see EOS item above);
- secretarial and other support for Chairmen (Kidd reported that in the UK NERC had agreed to fund a quarter-time secretary to support SSP activity);
- achieving greater flexibility for meetings between subgroups of panels;
- and the perception that PCOM frequently misses and fails to act on important recommendations in panel minutes.

General PANCHM issues included:

- improving feedback to proponents (see PRF item above and SSP's own discussions on Watchdog contacts with proponents below);
- add-on/supplemental science proposals (PANCM discussion had been led by the needs of SSP and PPSP and the procedures eventually adopted by PCOM came largely from the recommendations of these Chairmen);
- recommendations for deep drilling test sites; and
- panel membership procedures (PCOM modified its policy on proposals for panel membership to accommodate perceived difficulties in invitations to industry scientists).

5. PPSP (Garrison/Francis)

The PPSP met on Sept. 17-18, 1990 at the Pacific Geoscience Center at Sidney, B.C. Legs 136 (OSN-1 hole), 138 (Eastern Equatorial Pacific) and the Sedimented Ridges sites in the Middle Valley of the Juan de Fuca Ridge and in the Escanaba Trough were reviewed.

A portion of the Sedimented Ridge sites will be drilled as Leg 139. The Middle Valley sites MV1 through MV8 were approved with the understanding that the drilling order should be MV6, then MV1 or MV2 prior to drilling MV8, a hole expected to encounter high temperatures. Escanaba Trough sites ET-1 and ET-2, the latter to be drilled first were approved, but with the constraint that if temperatures greater then 350^{o} C were encountered, drilling should be stopped.

The OSN-1 site and the entire set of EEQ sites were approved.

The possibility of encountering H_2 at toxic levels in drilling the Juan de Fuca and Escanaba sites was discussed at some length. PPSP asked the Science Operator to develop a contingency plan to deal with this, as well as with H_2S released by sampling cores. As the COGLA imposes an extensive set of safety requirements dealing with H_2S all exploratory drilling, PPSP asked that they be informed of how the Science Operator responded to these requirements, but otherwise left the problem on hold, with the understanding that it was being handled effectively.

6. DATA BANK (Brenner)

BCOM approved a funding level of ~241K for the Data Bank. This is $2000 less than requested, but is not expected to cause any hardships. Brenner was uncertain what the impact of the "add-on" science program would be on the Data Bank's level of activity, but expressed the opinion (and hope) that it would not be too dramatic.

Brenner has redesigned and computerized the safety check sheets for PPSP. The changes were approved by present PPSP Chairman Ball and also sent to past Chairmen Garrison and Claypool for comments. The new sheets will be used for the first time at the May meeting of PPSP.

The Data Bank is in the process of turning its "card catalog" (cards describing data submitted to the Bank in support of DSDP/ODP drilling) into a digital document. Most likely this will be done as a Hypercard stack. Though the card catalog is primarily for internal Data Bank use, Brenner asked if SSP felt that the stack should be advertised and made available to the JOIDES community. He cautioned that: 1) the cards contain descriptions of data rather than actual data; 2) much of the data described on the cards is proprietary and not freely available, even to members of the JOIDES community; and 3) the cards describe only a portion of the actual data holdings at the Site Survey Data Bank (that is, they describe only the data that was submitted explicitly for DSDP/ODP purposes, and they ignore the huge volume of background reconnaissance data - which in fact has fewer restrictions on its release - that the Data Bank has on file).
SSP Consensus 3: **The Data Bank should proceed with the program of digitizing its card catalog, and the possible advertisement and distribution of the results to the general JOIDES community will be discussed again when the task is completed.**

PPSP will next meet in May at ODP/TAMU to review packages for Legs 140, 141, and 142. SSP members noted the possibility that one of these packages could include Hess Deep!

7. SEA LEVEL WORKING GROUP (Watkins)

The Sea Level Working Group, chaired by Paul Crevello, Marathon Oil Co., is charged with formulating a global approach to investigate the sea-level signal in strata from a diversity of depositional and geographic settings. Ultimately SLWG will develop guidelines, approaches and recommendations for use by ODP in investigations of global sea-level history as evidenced in the sedimentary record.

The first meeting of SLWG was devoted to a 'state-of-the-knowledge' review of the global sea-level issue, discussion of principal objectives, and establishment of an agenda for SLWG. SLWG developed an outline that will be the basis of a position paper to be presented to PCOM. SLWG also plans to identify and prioritize high-potential sites/transects/legs. Current proposals under consideration include the New Jersey and West Florida margin proposals. SSP members agreed that there was no basis yet for treating the sea level oriented proposals as anything other than individual proposals.

Some, perhaps many, of the sites will be located on continental shelves and slopes and will require detailed, sometimes shallower water, site surveys in order to meet objectives and satisfy PPSP requirements.

SLWG plans to conduct much of its work by fax or mail. A second meeting is proposed for November 1991.

8 DPG's

NORTH ATLANTIC RIFTED MARGINS (Blum)

The North Atlantic Rifted Margins Detailed Planning Group (NARM-DPG) met for the first time on March 25-27, 1991, at Woods Hole Oceanographic Institution. The DPG's mandate is to construct a prioritized plan for drilling volcanic and non-volcanic rifted margins based on a set of 7 highly ranked North Atlantic proposals (310, 311, 328, 334-Rev, 358, 363, 365-Rev), the COSOD reports, the Long Range Plan and other white papers. Rationale, objectives and strategies for drilling these margins are summarized in a preliminary DPG-Report draft at presently being prepared. All the proposed sites of the above mentioned proposals are plotted in the appendix map #1. (SSP Appendix 6).

The DPG defined two conjugate margin transects as first priority targets: 1) North Newfoundland Basin - Iberia Abyssal Plain (NNF-IAP) non-volcanic transect, and 2) southeast Greenland - Faeroe-Hatton Bank (SEG-FHB) volcanic transect. Individual sites have not been selected yet, and the originally proposed sites will be more or less modified based on the number of holes that can be drilled in the timeframe approved by PCOM. The sites from which the final drilling sites will be selected are highlighted in Appendix 6 (map #2).

The non-volcanic transect is identical to one of the two conjugate margins transects in proposal 365-Rev by Srivastava et al (Appendix 6, log sheet). Three of the originally proposed 10 holes on the NNB side, and three of the originally proposed 4-6 holes on the IAP side are considered the minimum for studying these margins.

As for the volcanic conjugate margins, only the SE Greenland transect, proposal 310 of Morton et al., (log sheet, Appendix 6) is likely to be drilled, and tied to DSDP Sites 552-555 and geophysical data on the Faeroe-Hatton transect. The strategy of drilling many shallow holes for systematic stratigraphic sampling of the seaward dipping reflector sequence was replaced by the strategy to drill only four; but these are planned to be approximately 500 m deep basement sections in order to recover more proximal parts of the basalt flows. One site on the Vøring margin from from proposal 358 of Eldholm et al., approximately between sites VM3 and VM4), was added to the drilling plan with the aim of getting a longitudinal component for variations in geochemistry and source material along the eastern volcanic rifted margin.

NORTH ATLANTIC ARCTIC GATEWAYS (Larsen)

A preliminary draft of the report of DWG "North Atlantic-Arctic Gateways (NAA DPG) Feb/Mar 1991 was reviewed. The DWG examined three proposals:

- 305 Arctic ocean drilling (Mudie).
- 320 Paleoceanography and paleoclimatology, Nordic Seas (Jansen)
- 336 Arctic to North Atlantic gateways (Thiede)

and provides a prioritized plan for a drilling program consisting of 15 sites (two legs).

The Norwegian-Greenland Sea links the cold Arctic Ocean with the warm-temperate North Atlantic Ocean via the northern gateway. The Fram Strait and the southern gateway across the Scotland-Iceland-Greenland Ridge in the Denmark Strait, the Faroe-Shetland Channel as well as across the Iceland-Faroe section of the ridge. The purpose of the programme is to describe the temporal and spatial variation in the important current systems and in sea ice distribution in the northernmost Atlantic and the Arctic Ocean and the development of the exchange through the gateways. In addition ,the history of mountain glaciers and ice sheets around the Nordic Seas is an objective.

The Arctic ocean sites (proposal 305) are mostly inaccessible with *JOIDES Resolution*. One site on the northern slope of the Yarmak Plateau may be accessible in favorable ice-years. The two other proposals are fairly similar. The basic plan is for:

sites on the Yermak Plateau and just to the south of the Fram Strait to track the development of the northern gateway;

a north-south transect along the East Greenland continental slope in order to track the history of the East Greenland Current and the glacial influence from Greenland; and an east-west transect from the Leg 104 holes on the Voring Plateau to Scoresby Sound in order to improve understanding of the evolution in surface water masses and of the downwelling of deep water. In addition to the above pattern of sites (a "paleo-environmental cross"), a few sites on both sides of the Faroe-Iceland ridge are included. The programme resulting from the DWG is a two leg program consisting of 15 sites, now a mix of the sites originally proposed. These are:

Northern Gateway Region:
- YERM 1, 4 and 5 (from 320), ARC 2A (from 305)
- FRAM 1B and 2 (from 320), identical to FST - 1
- FST - 2 (from 336)

Greenland Margin
- EGM 2 and 4 (from 336)
- GREEN 2 (from 320)

Greenland - Norway Transect.
- ICEP 1-4 (from 320)

Southern Gateway.
- DENS 1 (from 320)
- NIFR (from 336)
- SIFR (new).

ATOLLS & GUYOTS (Watkins)

The Atolls and Guyots DPG was charged with planning a two-leg drilling program that included all of the high priority targets of proposals 203-rev and additional targets of 203-rev and 202-rev to produce a balanced, maximized return from the range of scientific objectives in these proposals.

Principal objectives of the A & G proposals include investigation of Cretaceous sea-level changes, causes of drowning of carbonate platforms, investigation of regional uplift in the central and western Pacific, and plate motions. The investigation of sea-level changes are especially important to the establishment of global synchroneity of sea-level changes during the Cretaceous.

The area of investigation (see map, SSP Appendix 7) includes three families of sea mounts, viz., seamounts, mainly in the Wake Group, eroded with little or no carbonate development; guyots in the Japanese group capped by barrier reefs with thin lagoonal sediments; and drowned atolls of the Wake Group and Mid-Pacific Mountains. The latter were uplifted and karsted immediately prior to drowning.

The A&G DPG reviewed the scientific objectives of the two proposals, identified redundant targets and, subject to a port call in Majuro which will save 10-12 days transit, was able to arrange targets in a manner that met all objectives.

The DPG expressed concern over recovery and has requested that an effort be made to provide DCS capability during the drilling. Sites are located mainly on fans and in back reef areas. Fan sites will provide information on the deep water response to sea-level signals, whereas back reef sites will provide data from near surface signals.

Day Two began at ODP/TAMU at 0830 and Chairman welcomed Keith Louden and Lou Garrison.

3. SCHEDULED LEGS - FY '92

1. EAST PACIFIC RISE (Lewis)

New and/or recent data for both the 09° 30' N site and the 12° N site include near-bottom source/receiver refraction experiments performed by M. Purdy and G. Fryer. Short 1 - 1.5 km refraction lines were run in a wide variety of tectonic settings over both the northern and southern EPR sites. Preliminary interpretations of the refraction data suggest that there is a systematic variation in the thickness of low velocity "rubble" zone across the EPR. **SSP members commented that, should the apparent success in imaging the rubble zone be confirmed by the first drilling at EPR, we would need to consider incorporating this technique in our guidelines for survey data at bare-rock sites.**

In addition, *ALVIN* submersible observations of the 09° 30' N region of the EPR will take place in the Spring of 1991. The combination of new near-bottom refraction data and submersible observations with existing data should provide an adequate basis for drillsite selection.

2. SEDIMENTED RIDGES (Louden/Meyer)

No changes are currently proposed to drillsites for Leg 139 Sedimented Ridges 1. SSP recommended collection of additional deep-towed seismics and heat flow data for Sedimented Ridges 2 objectives but now that this drilling is scheduled after ODP's excursion into the North Atlantic, there is plenty of time to gather these data. It was noted that proponent Earl Davis has not yet lodged the latest Middle Valley data set with the Data Bank.

3. CHILE TRIPLE JUNCTION (Lewis)

Chile margin drilling, scheduled for November 1991- January 1992, will comprise one leg (141), concentrated on the collision zone of the triple junction region. One three-hole dip transect (sites SC-1, -2, and -3) are located along Conrad MCS Line 745, with additional sites located on MCS Line 750 (SC-4), Line 751 (SC-5), and Line 762 (SC-6). All sites lie within the region mapped by SEABEAM and GLORIA, and all sites are covered by other underway geophysical data. The seismic data along which sites SC-1 through SC-6 are located have been post-stack migrated, with pre-stack depth migration completed on some lines and being completed on the other lines. Watergun SCS data are being used to calculate the regional thermal gradient distribution based on the depth to the BSR reflector. Imaging of the BSR reflector is clear on most seismic lines, and a drilling strategy is being formulated with input from SGPP to incorporate clathrate/gas hydrate scientific objectives into the overall Chile Margin drilling program. Safety review of these sites is expected in May, 1991. PPSP is likely to require a specific order of drilling the sites to gradually build up knowledge on drilling the BSR. Updated SSP matrices for the Chile Margin drillsites have been finalised.

4. ATOLLS & GUYOTS (Kidd)

The data set from the USSAC-funded Marshall Islands cruise on *Moana Wave* has been lodged with the Data Bank. As far as SSP is aware there has been collection of new data related to the Cretaceous guyots component of the A & G program since the Panel voiced concerns over the quality of seismic reflection data over sites planned for basement objectives. Proponent Winterer was requested, following his presentation at the April '90 Menlo Park meeting of SSP, to pursue ways of either collecting better seismic profiles or obtaining sonobuoy data because imaging of basement was very unclear on the profiles presented. The A&G DPG has apparently retained these particular sites in its two leg program.

SSP Consensus 4: SSP reiterates the concerns it has expressed over the quality of seismic data over sites in the Cretaceous Guyots component of the Atolls and Guyots program that have basement objectives. The Panel requests that the DPG examine whether these objectives might be met at other guyots where the seismic data is of better quality.

5. NORTH PACIFIC NEOGENE (Larsen)

Site PM-1 (Patton Murray Seamount) was approved by SSP at the Hannover meeting.

Sites NW1A, NW3A and NW4A were also approved at the Hannover meeting, however SSP recommended that other opportunities to collect better data should be investigated and pursued.

OHP recommended that Site NW3A be deleted from the scheduled leg.

SSP received a map with new positions for the DS1, DS2, and DS3 from Lloyd Keigwin. The drilling position was not marked on the enclosed photos of the seismic lines, so the exact positions are unclear. Further we were told that OHP propose an addition of one site, DS4, but the position of this is not known to SSP.Because of the shift of positions of the sites from the ones reported in SSP minutes from July '90 meeting in Lamont we require a new designation for the sites.

DS-1D - the new site, was selected on two crossing SCS lines from the *Thomas Washington* data. The layers outcrop in erosional channels about 5 nm from the site so the structure is not closed. Basement is poorly imaged and the deepest parts of the sequences appear missing at the site. **The Panel recommended a shift of the new site DS-1D along its SCS line to avoid the possible omissions in the deeper parts of its sedimentary sequence**

DS-2B - This new site is positioned on a SCS line but with additional SCS lines within a distance of 1-5 nm. The data are sufficient from an SSP point of view.

DS-4 is called "DS-2B - 3300 m" in the letter from Keigwin but is not the one called DS-2B in the SSP minutes from July 12-13 '90. DS-4 is positioned on crossing SCS lines from the Washington data set. The data are sufficient for SSP.

SSP Consensus 5: Provided that the additional Detroit seamount site is selected within the 2400-3000 m depth interval in the seismic data grid of the Washington and Farnella seismic lines, the critical data for the North Pacific Transect are in hand. The seismic reflection data are poor for a number of sites, but are still judged as sufficient for the drilling objectives as long as high-quality seismics are run by the drillship on arrival and departure of the sites.

6. HESS DEEP (Kidd)

SSP returned to discussion of PCOM's decisions on Hess Deep. There was strong condemnation of its actions in the light of JOIDES' general philosophy that ODP is beyond the exploratory stage and now aims to test well-constrained models with drilling. It was reiterated that part of SSP's function is to ensure that site survey data is sufficient to place any drilling in a regional context.Our view of the absence of quality seismic data at Hess

Deep was that this was certainly not possible there. Louden and von Herzen pointed out that SSP members were wasting their own time and JOIDES funding if PCOM were prepared to ignore the panel's findings in such a blatant way. Kidd, who attended PCOM as Panel Chair, stated that SSP's mandate was to advise PCOM and it was then up to PCOM whether to act on its recommendations or not. In this case, PCOM had considered that the single site leg now inserted in the program did not require the regional control that could be provided by MCS surveys. The concerns of the SSP members were such that PCOM liason Watkins arranged for a telephone call between Kidd and PCOM Chairman Austin.

Austin made the following points to be relayed to the Panel:

"PCOM does listen to the recommendations of SSP and the other Panels";

PCOM needed to insert a leg after it became clear that DCS development was likely to be slower than it had previously envisaged. Hess Deep was the top LITHP target after EPR and top TECP target after CTJ.

The inserted Hess Deep leg is now specifically for lower oceanic crust objectives and Moho petrology at a single site;

PCOM members considered the MCS surveys to be necessary only for later more regional objectives and any SCS to be largely inadequate. The proposal for MCS surveys has not been funded in the present NSF program but the Dorman et al deep-towed work would be done.

Proponent Henry Dick has obtained USSAC funds to travel to French and other institutions to gather together a survey package for drilling on either Leg 140 or Leg 141 Austin offered to sanction a meeting for Dick to present the resulting data package to a sub-group of the Panel between now and the next SSP meeting, or to have Dick attend as a guest at the next SSP meeting.

SSP returned to its discussion with no great feeling that its concerns had been allayed. Members were most concerned over the impossibly short leadtime, should Hess Deep be scheduled for Leg 140 (Sept/Nov '91), for review the data related to the single site. Some noted our LDGO recommendation that drilling should not be scheduled before late 1992, which fits better the option to drill Hess Deep on Leg 147. There seemed no point in arranging for a sub-group to meet to view data for Leg 140 drilling; the proponent would be better employed getting together with Carl Brenner to prepare a package for direct presentation to PPSP. Arrangements could be made for SSP to assess the survey package if the leg is scheduled as Leg 147. (SSP members wished ODP/TAMU every success in cleaning out Hole 504B!)

SSP Consensus 6: SSP reiterates its concerns that additional geophysical data is needed at Hess Deep, primarily detailed MCS data to characterise regional crustal structure and deep-towed seismics and sidescan to image possible rubble. The Panel notes that, even for the currently-envisaged single-site petrologic objectives, no survey package is yet available for assessment and reiterates its recommendation that this exciting science be drilled late in the FY'92 program.

7. CASCADIA (Louden)

The panel reviewed briefly the final sites selected by the Cascadia Margin DPG in Aug 1990 and subsequently adopted by PCOM in Hawaii. The Oregon sites are all located along recent multi-channel profiles at or close to cross lines. These profiles, as previously reviewed by SSP, reveal clear images of the various faults which are the primary targets of these drill holes. Surface evidence for these faults is indicated by previous deep-towed side-scan images and submersible dives. The Vancouver sites are also located with multi-channel seismic lines. With the exception of site VI-5, these are all on or close to cross lines and also include high resolution images from deep-towed side-scan profiles. The primary objective of Site VI-5 is to drill through a complete hydrate section including a clearly imaged BSR. The issue of this BSR drilling is being addressed by the working group of PPSP. We note that Site VI-5 lies on a basement high and is not close to a crossing multi-channel seismic line. The exact location of this site requires further justification and supporting documentation, particularly from a grid of high resolution (watergun single channel) seismic profiles at the proposed site location. Data in support of this site location and results of the working group on hydrate drilling should be provided at the next SSP meeting. The remaining sites satisfy SSP requirements. We note, however, numerous errors in the table of site locations from the DPG report which need to be corrected.

4. STATUS OF NORTH ATLANTIC PROGRAMS

1. NORTH ATLANTIC RIFTED MARGINS DPG PROGRAM (Lewis)

The NARM-DPG preliminary report defines drilling objectives on North Atlantic rifted margins to be "the description and understanding of upper crustal to upper mantle igneous and deformation processes and deeper mantle processes and dynamics associated with and causing continental break-up". The DPG has combined specific sites and objectives from 7 individual proposals into a coherent drilling plan based on the "conjugate margin transect" concept. Four transects, requiring approximately 4-6 drilling legs, were identified:

1) Northeast Greenland - Voring Plateau (proposal #358 and sites 642-644,
2) Southeast Greenland - Faeroes/Hatton Bank (proposal #310 and sites 552-555,
3) Northern Flemish Cap - Goban Spur (proposal #365 Rev.), Newfoundland Basin - Iberia Abyssal Plain (proposal #365 Rev. and sites 637-641.

These transects include both volcanic and non-volcanic margin targets.

Data in support of proposed drillsites include a wide variety of single-ship MCS data, some two-ship constant offset and expanding spread profiles, previous drilling results, side-scan sonar data, submersible observations, and coring samples. However, some proposed sites are not presently located at seismic line intersections, and other site survey requirements are not explicitly satisfied. Additional site survey data may be required for some sites. Specific drilling objectives and site locations will continue to be refined during a possible additional meeting of the NARM-DPG, to take place during the summer of 1991.

2. NORTH ATLANTIC-ARCTIC GATEWAYS DPG PROGRAM (Larsen)

1. Northernmost Atlantic Paleoceanography: Arctic Gateway proposals:

-305 Arctic Ocean - the basic problem here is ice so the area is hardly accessible for the drillship. Most of the proposal should probably be included in the NAD project.

-ARC 1 A, B, C, on Alpha ridge. No specific sites so SSP evaluation is not possible. In general the seismic data is hardly adequate - but we need to assess better copies of the material.

-ARC 2A and 2B. Yermac Plateau. Site 2A is included in the NNA-DPG programme. High resolution seismic profiles along and approximately perpendicular to the slope. The MCS lines need migration in order to clarify the top of basement. Coring data for reentry is desirable. Proponents should consider whether to split the objectives into two sites one for basement and one for the sedimentary sequence. For Site 2B a much better regional data set exists - see proposals 320 and 336.

-ARC3 Nansen G. Ridge - Better definition of the basement target will be required.

-ARC 4 - No data to review

2) The YERMAC and FRAM Strait sites. The data seem in general to be sufficient. However, high frequency processing for better definition of the sequence to be drilled will be a requirement.

3) The East Greenland margin sites. EGM1-4 - In general the data is adequate but seismic sections along the shelf slope and roughly perpendicular to the slope will be desirable. Most of the seismic sections illustrated in the proposal are very low frequency and consequently there is low resolution for the sequences to be drilled. Processing will be required for better resolution of the upper sedimentary sequence at many of the sites. The occurrence of coarse ice-rafted debris should be evaluated using existing sample information and coring at the sites.

Green 1 and Green 2 Sites are to be determined after upcoming site surveys.

4) The Greenland - Norway Transect ICEP high resolution seismic lines roughly N-S and E-W and with good imaging of the basement are needed. Magnetic measurements across the sites are also required to determine magnetic anomalies.

5) The Southern Gateway.

-NIFR-1 (North of the ridge) Here data is probably sufficient to meet SSP's guidelines.

-NIFR-1 and DANS-1 - No data available

SSP Consensus 7 : None of the seismic data for the North Atlantic- Arctic Gateways Program are in the ODP data bank and proponents are urged to begin sending the pertinent material. In general, seismic data illustrated in the proposals are very low frequency so details of importance for the planning and interpretation are not visible. Higher frequency processing or collection of high resolution SCS will be required. As processes objectives in many sites are both for transport along-slope as well as transport down-slope, crossing seismic lines will be necessary. Data on frequency and size of ice-rafted debris should be compiled in order to select proper drilling methods.

3. OTHER NORTH ATLANTIC PROGRAMS

1. 361Rev Hydrothermal System, TAG Area (von Herzen)

This proposal for drilling an active hydrothermal system near a slow spreading ridge axis has been revised only very recently; it was not available to the Panel and not discussed in any detail. Some survey data are available from several cruises to the site, including one with submersible (Alvin) observations/sampling. Watchdog responsibilities are now assigned to K. Louden, after R. von Herzen has become a minor proponent on the drilling proposal.

2. 369 Deep Mantle Section, MARK Area (Hirata)

For the Kane Fracture Zone, we already have the SeaBeam and SeaMARC data from the *Conrad* and *Hudson* surveys for Legs 106/109, including the processed sub-bottom profiles and bottom photos. There are also refraction data, magmatic survey data, gravity data, and submersible studies with the *Alvin* and the *Nautile.* So, we have good data in this area. We do need to obtain the submersible dive results for assessment.

3. 348 Paleogene/Neogene Stratigraphy, New Jersey Margin (Kastens)

This proposal seeks to evaluate the timing and amplitude of eustatic sea level changes during the lower and middle Miocene by drilling a transect of holes across the continental slope and upper continental margin offshore New Jersey, eastern U.S.A. Taken together with analogous passive margin transects in different age sediments on different rift-age margins, this leg would test the "Vail hypothesis" which ties seismic stratigraphy to eustatic sea level changes, and would help to constrain the mechanism of climatically-driven sea level change.

The existing proposal is a preliminary proposal without specific sites. The preliminary proposal was based on a respectable network of U.S.G.S. and industry seismic lines, exploratory industry drilling, plus DSDP drilling during legs 93 and 95. The strategy is to drill onshore-offshore transects into representative sedimentary "sequences," where a "sequence" is an unconformity-bounded lens of sediment hypothesized to correspond to a sea level cycle. Both the ages of the sequence boundaries and the onshore-offshore facies relationships within a given sequence are of interest. An effort will be made to site holes such that each hole can penetrate vertically through several sequences. Since the preliminary proposal was written, a dedicated seismic cruise (R/V Ewing EW9009) has collected 2400km of multichannel seismic lines on the continental shelf and 1400km of single channel seismics lines on the continental slope in the proposed drilling area. In addition, the detailed bathymetry of the area has been mapped with SeaBeam and Hydrosweep multi-narrow beam echo sounders, and a series of *Alvin* submersible dives has sampled the stratigraphy exposed along the deeply-incised slope canyons. The proponents anticipate submitting a mature drilling proposal, incorporating the new data and pinpointing specific drillsites, in June of 1991. They do not anticipate any significant changes in experimental design in the revised proposal.

This project appears in good shape with respect to Site Survey Panel requirements. The seismic network is extensive, and the new EW9009 data appear to be of excellent quality. All of the data designated as "vital" for passive margin drilling on the SSP matrix (MCS & velocity determination, grid of intersecting seismic lines, and 3.5 or 12kHz) is in hand. No refraction data (designated "desirable" on the matrix) are available, but the MCS velocity determinations seem adequate for the relatively shallow holes proposed. The proponents have not yet compiled heat flow data ("desirable" for passive margin drilling) for the area. Hydrocarbon shows have been found in nearby exploratory industry boreholes, so the proponents will need to do their homework carefully to satisfy the PPSP; however, the anticipated quality and quantity of the seismic data are such that it should be possible to select and document safe drillsites.

SSP Consensus 7: One operational concern that needs prompt attention from the TAMU engineering staff, in the light of proposals for sea-level objectives on North Atlantic margins, is shallow-water drilling. The New Jersey proposal, for example, includes sites (albeit lowest priority) in water as shallow as 20m, and is vitally dependent on successful drilling in water as shallow as 60m.

4. 313 Major Oceanographic Pathway, Equatorial Atlantic (Pautot)

The quality of seismic lines shown in this proposal is not appropriate for the deep drilling : >1km penetrations are proposed on poor quality SCS lines. Additional seismic data will be expected for any site survey package and with more precise site locations.

5. 333 Evolution of Pull-Apart Basin, Cayman Trough (Lewis)

Six proposed drillsites address problems of the tectonics of pull-apart basin structural geometries and subsidence patterns (CAY-1 and CAY-2); the mode and timing of the inception of spreading of the Cayman Trough spreading center (CAY-3, CAY-4, and CAY-6); and verification of magnetic anomaly identifications and sampling of oceanic crustal layer 3 (CAY-5). In addition, the state of stress will be measured in all sites in order to determine whether or not the Cayman Trough transform system is characterized by a broad (50-100 km wide) zone of compressive stress, as is the case for the San Andreas and Philippine faults.

Data in support of site selection includes both MCS and SCS seismics, GLORIA and SeaMarc II acoustic imagery, submersible sampling, and underway geophysical data. Most sites are presently located at the intersections of seismic lines. CAY-5 is a bare-rock site, and will require the deployment of a guidebase. The level of data available is such that it was possible to prepare at the meeting site survey matrices for sites CAY-1 through CAY-6.

The watchdog role for this proposal now passes from Lewis to Kidd.

6. 346Rev Equatorial Atlantic Transform Margin (Pautot)

Seabeam and quality SCS watergun data are the basis of this proposal for drilling. The set of data presented in the proposal and supporting data announced as available seems to be appropriate for the proposed drilling. MCS lines and refraction analysis on the proposed sites should be deposited in the Data Bank since penetrations of 1.0 to 1.5km are suggested. All other relevant information including SCS, magnetics, gravity, submersible informations should also be filed in support of this proposal.

7. 347 Late Cenozoic Paleoceanography, South Equatorial Atlantic (Farre)

The purpose of this proposal is to reconstruct the dynamics of trans-equatorial heat transport in relation to NADW formation; intermediate currents and productivity variations throughout the Neogene.

Three drilling transects are proposed: 6-1/2 to 9-1/2 weeks estimated time - Double or triple APC holes:

S. Equatorial East Transect: 4 sites - 3-4.5 km water depth - Low Frequency seismics and "Parasound" echosounder records available (~40m penetration);
S. Equatorial West Transect: 4 sites - 3-4.5 km water depth-"Parasound" profiler data available;
SE of Sao Paulo Transect - 5 sites - 3-5 km water depth - plans are to collect "Parasound" profiler data in Spring '91.

8. 376 Layer 2/3 and Crust/Mantle Boundaries, Vema Fracture Zone (Hirata)

According to the track chart provided by the Data Bank, a large amount of data is already filed on the Vema Fracture Zone area. We need to see the SeaBeam data that the proponents cite, that are not in the Data Bank. Also the data collected by the *Nautile* dive which includes bottom photos should become part of the site-specific data package. The watchdog has been now been changed from Hirata to von Herzen.

9. 378Rev Growth and Fluid Evolution, Barbados Accretionary Wedge (Moore)

This proposal is for a 4-leg, 26-site drilling program aimed at understanding 1) fluid flow through an accretionary prism, 2) processes occurring at the deformation front, and 3) evolution and growth of an accretionary wedge. Three areas would be drilled: the lower slope of the north Barbados Ridge (NBR), the lower slope of the south Barbados Ridge (SBR) and the upper slope of the SBR. NBR drilling would be in the Leg 78A/110 transect and would deepen three existing holes to basement and add additional sites higher up the slope. The lower SBR holes would be aimed at understanding subduction zone processes in an area where thick terrigenous sediments are being deformed. The upper SBR holes would be drilled to understand deformation at the outer-arc ridge - forearc basin boundary.

Site survey data in the lower slope areas consist of SeaBeam maps, fairly old, low-fold, low resolution French MCS lines, four LDGO/British wide aperture MCS lines, and French near-bottom side-scan and 3.5 kHz data. A cruise to obtain higher resolution MCS lines plus OBS velocity data will be carried out by Westbrook in 1992. 3-D seismic acquisition is being proposed for the NBR lower slope by T. Shipley and G. Moore thus the watchdog role on this proposal now shifts from Moore to Kidd.

10. 323Rev Alboran Basin and Atlantic-Mediterranean Gateway (Kastens)

This proposal combines two conceptually different goals which are geographically contiguous. The first goal is tectonic: to understand the rifting and subsidence history of the Alboran Sea (east of the Straits of Gibraltar, between Spain and Morocco) and its relationship to compressional tectonics in the surrounding orogens. The second goal is paleoceanographic: to elucidate the Neogene history of water exchange between the Atlantic and the Mediterranean, with a particular emphasis on the amplification of climatic signals (e.g. sealevel oscillations) in a marginal sea. The paleoceanographic goal requires sites both east and west of the Straits of Gibraltar; however the eastern sites can be the same as those required for Alboran Sea tectonic objectives. The original proposal (dated March 1989) envisioned one drilling leg for both goals. The current proposal (dated January 1991) requests two legs, one in the Alboran Sea and one in the Gulf of Cadiz (west of the Straits of Gibraltar).

The available data set in the Alboran Sea, as documented in the proposal, seems quite extensive. There is a dense network of industry MCS lines on the Spanish margin, and a less dense reconnaissance network covering the rest of the Alboran Sea. It is difficult to evaluate the data quality, but judging from the xerox-reduced profiles in the proposal the quality appears to be adequate for preparation of site survey packages. The proposal discusses five "sectors" for potential drilling. In the three highest priority sectors, specific sites have been documented and pinpointed at intersecting MCS lines of apparently good quality. In the two lowest priority sectors (which would only be drilled if the Alboran Sea gets an entire leg), existing data were not considered adequate to specify sites. A Spanish-German MCS cruise planned for 1991 is expected to complete the requisite seismic data set for sectors 4 and 5. Well logs and cuttings are available for four industry boreholes on the Spanish margin; a single industry borehole on the Moroccan margin exists, but the proponents have not yet been able to acquire data from these wells. Single channel seismics, 3.5kHz, and core samples are said to be abundant. Seismic refraction, gravity and magnetics data are mentioned in the text, but the extent of these data are not documented. GLORIA, Deep Tow (SAR) side-looking sonar, SeaBeam and heat flow measurements are scheduled or proposed for 1991-1992.

The Gulf of Cadiz data base is not as well documented in the proposal. A network of MCS commercial seismic lines is mentioned in the text, but neither a track chart nor sample profiles are provided. A reasonably dense network of single channel seismics seems to have been used to select the three primary and three alternate sites in the Gulf of Cadiz. The illustrated SCS profiles appear to be of high quality. Numerous gravity cores and "almost complete" GLORIA coverage are also available. Apparently the OHP asked the proponents to add a site southwest of the Gibraltar Sill; no documentation is provided for this extra site.

In summary, this project has a good start towards satisfying SSP requirements. A critical turning point for this project will be the decision for one leg or two legs. If two legs are allocated, then considerably more data must be provided to evaluate Sectors 4 and 5 in the Alboran Sea, and the site SW of the Straits of Gibraltar. In either case, additional information will be required for the Gulf of Cadiz sites. No data at all has been forwarded to the ODP Data Bank for either the Gulf of Cadiz or the Alboran Sea.

11. 343 Window of the Cretaceous Volcanic Formation, Carribean Zone (Farre)

The purpose of this proposal is to better understand the processes, history, tectonics and origin of thickened oceanic crust that resulted from widespread Cretaceous mid-plate volcanism in the Venezuelan & Columbian Basins. Other topics include evolution of the Beta Ridge (that separates the Columbian from the Venezuela Basin) and the Pecos Fault Zone (the boundary between the Columbian Basin and the Beta Ridge).

Three sites are proposed:

1) Foot of a "cliff" marking the edge of thickened oceanic crust: to sample normal oceanic crust. The proposal is for 1100 meters of drilling to the top of oceanic crust then (?) m of basement penetration.

2. Sample the "cliff" edge to recover a section of thickened oceanic crust (~800 m to 1km of volcanic section) then (?) m of basement penetration.

3. Rough basement penetration at top of Pecos Fault Zone (900 meters of sediment then (?) of basement penetration).

The proponents note that the existing seismic data are not sufficient to select the sites. If this proposal was highly rated they recognise that they will need to plan for an MCS survey.

12. 345 and 345 Add. Sea Level and Paleoclimate, West Florida Margin (Moore)

The objective of this proposal is to provide documentation of the timing of sea level change and to "bracket" amplitudes of Cenozoic sea levels. The west Florida margin is a carbonate ramp with good lateral continuity between shallow and deep-water regions and with well-developed seismic stratigraphic sequences. The proposed sites will provide the basis of multi-disciplinary paleoclimate studies addressing 1) the timing and magnitude of Pliocene meltwater discharge from mid-latitude ice sheets, 2) the extent of phosphorite deposits along the west Florida margin, especially within the Tertiary, and 3) the history of Loop Current circulation in the Eastern basin.

A transect of 6-7 sites is planned, extending from shallow (90 m) to deep water (1125 m), with penetrations of 500 to 1170 m. Drilling time would be 40 days.

The site survey data set for this proposal is excellent. A grid of high-quality single-channel seismic lines has been collected by one of the proponents (Mullins) and a detailed grid of MCS lines has been shot in the area by Digicon. Several of these lines have been provided by Unocal. In addition, numerous bottom samples exist in the area, ODP site 625 was drilled along strike (about 300 km away), three industry wells have been drilled on the shelf landward of the proposed transect, and correlative on-land sections exist nearby. The Site Survey Panel notes the existence of USGS GLORIA data in this area and suggests that the proponents arrange to study these data in light of known slumps and channels on the west Florida margin.

13. 372 Cenozoic Circulation & Chemical Gradients (Larsen)

Site NAMD-01 is a proposal for redrilling of DSDP Site 116.

In addition to the site survey data from DSDP Leg 12, new MCS data exist at the Geological Survey of Denmark.

Site NAMD-02 (Morocco) The drilling depth is not indicated for this site. In order to detect sediment disturbances it is recommended that the site is selected on crossing high resolution SCS lines. The lines shown in the proposal may be sufficient.

It was noted that the latter site probably is included in the revised Mediterranean gateway proposal 323-Rev.

Day Three began with discussion of more general business.

5. "ADD-ON"/SUPPLEMENTAL SCIENCE PROPOSALS (KIDD)

Two S-proposals have been received to date by the JOIDES Office but enquiries have been made linked to other submissions. The two received (Appendix 8) are for drilling on Navy Fan (Piper et al) and for additional downhole measurements in Hole 801C Jurassic Crust (Larson et al). The latter will require no action by SSP but the Navy Fan proposal involves poor quality (old) seismics and also proposes 6 days of drilling. This will certainly require SSP review if it is favoured by the thematic panels. Kidd has received a letter requesting information on SSP procedures from Piper.

SSP Action Item 5: (Kidd): SSP Chairman will respond to proponent Piper's enquiry regarding the Navy Fan S-proposal noting that the intention is for 4 days of drilling maximum for supplemental science and suggesting he take action to obtain better seismic data.

SSP member Kastens offered to help with mail review if this becomes a favoured proposal. All members will await contact on S-proposals that pass thematic panel review.

6. RECOMMENDATIONS FOR REVISION OF SSP GUIDELINES (Kidd):

JOIDES Office expects to publish a revised version of the 'Guidelines for Proponents' in the June JOIDES Journal. SSP discussed possible changes in the light of probable relaxation of safety guidelines on BSR drilling; the implications of deep-towed seismics for imaging of the rubble zones of bare-rock sites and the needs of fracture zone and other petrologic drilling in the light of the Hess Deep saga. Members took the view that in none of these areas were we ready to make major changes or create new categories in our guidelines matrix of requirements. Some minor changes were recommended which would be in the 'desirable' category and Kastens took the task of circulating a modified matrix that Kidd could pass to Blum when agreed.

SSP Consensus 8: SSP considers that it is too early to make major changes in its guidelines, in particular for BSR and FZ drilling. It will, however, provide JOIDES Office with some minor modifications prior to publication of the revised 'Guidelines to Proponents'.

SSP Action Item 6 (Kastens/Kidd): A revised version of the SSP Matrix of Data Requirements will be circulated by Kastens. SSP members will contact Kidd with any changes. Kidd will send the final version to Blum by 1 May.

7. OTHER BUSINESS:

1). ***Feedback to Proponents (Kidd).*** It was agreed that feedback to proponents from SSP should be by personal contact through its 'watchdogs'. Initial letters should always reference the current "Guidelines to Proponents" and the SSP's matrix of data requirements and also note the matrix categories that we see the proposed sites falling in. An example letter was prepared by Kidd with additions from Brenner to ensure that all the points discussed were covered. **Copies of all feedback correspondence will be sent to Kidd but also filed with the Data Bank. Proponents will be encouraged to continue to submit their data there rather than directly to SSP** watchdogs. *Feedback to North Atlantic proponents from this meeting will await PCOM's April rankings.*

2) *Panel Membership* (Kidd). In the light of discussions at the Hawaii PANCHM & PCOM meetings, Chairman polled the members on their status for rotation. Only *H. Meyer* is due for rotation in 1991. He will be replaced by another German representative after SSP's fall meeting.

3). *Electronic Communications* (Brenner). After discussion of how SSP could speed up its communications given the introduction of S-proposal mail reviews, it was agreed that each member would pursue getting themselves linked through E-Mail. Brenner offered to set up a SSP 'central mailbox' through the Data Bank.
SSP Action Item 7 (All SSP Members): The Panel will begin to communicate by E-Mail through a central Data Bank 'Mailbox'. Each will send an initial message to Carl Brenner using the following:

ODP@LAMONT.LDGO.COLUMBIA.EDU.

4) *Next Meeting.* After discussion of member's time constraints for a Sept./Oct.'91 SSP Meeting with regard to seatime and teaching, the Panel decided on dates in the second week of September. The present SSP Meeting was originally scheduled for a foreign member country, namely Japan, and Naoshi Hirata said he could host the meeting in Tokyo.
SSP Action Item 8 (Kidd): Chairman is to write to J. Austin requesting that the next *SSP Meeting* be held at *ORI, Tokyo* over three days: *September 3-5, 1991*, hosted by *Hirata*. The prime agenda items will be detailed assessment of N. Atlantic data sets in the light of the new PCOM global rankings.

The ODP/TAMU meeting was officially closed at 1130 on Day Three allowing members to prepare their sections of these minutes prior to leaving College Station.

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University of Texas at Austin

Copies to Messrs :

SUBJECT : PCOM April 23-28

TEDCOM affairs that need to be brought up:

- Deep drilling.
  I am still awaiting details of hypothetical deep drilling sites, so that they can be used by TAMU as the basis of deep drilling studies. These details were promised by LITHP at the Kona meeting, but have not yet been received.

- Approval of next TEDCOM at San Diego. Proposed dates:

  July 7 Ship visit
  July 8-9 Meeting.

  Host: Scripps

  Participants: TEDCOM members and liaisons.

  Tentative Agenda:
  . Operations reports
  . Results of Eng. Leg 3A (137)
  . Development of DCS 2 and 3
  . Perspectives for Eng. Leg. 3B (140)
  . Deep drilling studies

000234

JOIDES LITHOSPHERE PANEL: MINUTES OF 14-16 MARCH 1991 MEETING LA JOLLA, CALIFORNIA

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Ans'd............

EXECUTIVE SUMMARY

1.0 LIAISON REPORTS

1.6 Downhole Measurememts Panel

LITHP is concerned about the status of the Wireline Packer, which it views as critical to meeting the high priority objectives of several upcoming legs.

LITHP endorses DMP's requests for a group to be convened to address this issue, and stresses the urgency for the 1992 drilling schedule. In addition, high temperature capabilitities need to be investigated.

1.8 North Atlantic Rifted Margins DPG

LITHP is in overall agreement with the preliminary selection of the high priority transects. However, a number of concerns, particularly relating to the timing of magmatism and the development of testable models of magmatic evolution during early rifting need to be addressed..

LITHP recommends to PCOM that an additional petrologist be added to the NARM-DPG, and nominates A. Saunders (U. Leicester) for that position. In addition, S. Cloetingh will act as LITHP liaison to the NARM-DPG.

2.0 RESULTS OF RECENT CRUISES AND PLANS FOR UPCOMING CRUISES

2.1 Preliminary results of Leg 135

This leg emphasized the need for 24-hour coverage of the XRF and thin section labs during cruises with hard rock objectives.

LITHP endorses the recommendation of the Shipboard Measurements Panel that shipboard technician coverage on hard rock legs be sufficient for the XRF, XRD and thin section facilities to be operational continuously throughout each day.

2.2 Plans for Leg 137

The possibility exists that the viability of Hole 504B, or the likelihood of being able to deepen it significantly, may not be clear-cut after Leg 137. A decision to continue or to abandon future efforts at this Site will need to be made quickly so that appropriate preparations can be made for Leg 140.

If this situation arises, LITHP will review the results of Leg 137 as soon as they are available and make a recommendation to PCOM regarding the future of Hole 504B.

2.4 Plans for Leg 142

LITHP strongly supports the change in primary site for EPR drilling to the on-axis site--EPR-2--to be started during Leg 142. This recommendation is based on an examination of recent seismic data, consideration of the scientific objectives of EPR drilling, and the desire to select the least problematic drilling site to adequately test the DCS Phase II system for bare-rock drilling.

4.0 UPDATE ON ENGINEERING DEVELOPMENTS

LITHP is concerned with the current communication mechanisms that exist between the panel and ODP Engineering activities. It is critical that concerns arising during engineering development that could seriously impact LITHP's planning process be conveyed to the panel.

Given the sensitivity of LITHP decisions concerning scheduling of high priority drilling programs to the timeliness of engineering developments, LITHP requests that an ODP Engineer attend both of its meetings each year.

5.0 RANKING OF PROPOSALS

Twenty-nine programs were considered in the ranking procedure, which was carried out be each panel member ranking their top ten priorities. The top ten highly ranked programs were:

Rank	Program/Theme	Proposal #	Area	Total Votes
1	Offset drilling: Layer 2/3. etc.	375-Rev.	Hess Deep	106
2	Hydrothermal processes at slow spreading ridge	361/A	TAG	78
3	Axial crustal drilling-- EPR II	EPRDPG Report	EPR, 9°30'N	75
4	Volcanic rifted margins	392-396	N. Atlantic	62
5	Sedimented Ridges II	SRDPG Report	Escanaba Trough	45

6	Layer 2/3, Layer 3/ mantle transitions	376/A, 382/A	Vema FZ	45
7	Upper mantle	369/A	MARK area, MAR	43
8	Non-volcanic rifted margins	334-Rev., 365-Rev., et al.	N. Atlantic	29
9	Hydrothermal processes at medium spreading ridge	325/E	Endeavor Ridge	26
10	Oceanic plateaus	142/E-Rev.	Ontong-Java	21

Two PCOM action items arose from this procedure:

1) There are now three programs within the top seven that relate to offset drilling strategies. The first leg of Hess Deep is on the 1992 schedule, and offset drilling is specifically mentioned in the Long Range Plan.

   LITHP once again strongly urges PCOM to create an Offset Drilling Working Group to establish and prioritize the scientific objectives of a program for drilling offset sections of the crust and upper mantle. It is critical that this begin as soon as possible in order that a program be formulated for implementation within the upcoming drilling schedule.

2) The Red Sea is a region of high scientific interest to LITHP, but there are concerns over the availability of research clearance.

   LITHP requests an update from PCOM and/or ODP concerning the status of obtaining research clearances in the Red Sea, and advice as to whether drilling in this region can now be considered.

7.0 OTHER BUSINESS

7.1 Panel Replacement

M. Perfit is due to rotate off LITHP. LITHP nominates S. Bloomer (Boston University) as his replacement (he is willing to serve).

7.3 Next Meeting

The next meeting will include a joint session with TECP and will be held on 9-11 October 1991 in Cyprus.

JOIDES LITHOSPHERE PANEL: MINUTES OF 14-16 MARCH 1991 MEETING LA JOLLA, CALIFORNIA

Attending: J. Bender, T. Brocher, M. Cannat, S. Cloetingh, J. Erzinger, S. Humphris, D. Moos, M. Parfit, J. Phipps-Morgan, A. Saunders (alternate for P. Kempton), G. Smith, Y. Tatsumi, R. Zierenberg

Liaisons & Guests: J. Natland (PCOM), J. Karson (TECP), J. Allan (TAMU), M. Storms (TAMU)

Regrets: J. Franklin, J.McClain

WELCOMING REMARKS

J. Phipps-Morgan welcomed the Panel to Scripps Institution of Oceanography and discussed meeting logistics.

S. Humphris welcomed J. Bender, M. Cannat and R. Zierenberg as the new members of LITHP, J. Karson as the new liaison to TECP, A. Saunders as the U.K. representative in place of P. Kempton who is at sea, and M. Storms as a guest.

1.0 LIAISON REPORTS

1.1 PCOM (J. Natland)

The major item of business at the November meeting of PCOM in Hawaii was to establish a schedule for drilling between mid-November 1991 and October 1992 based on the thematic panel rankings of the programs presented in the Pacific Prospectus. The following sequence of legs were approved, resulting in a two-month extension of Pacific drilling:

Leg 140	Site 504B* or Hess Deep
Leg 141	Chile Triple Junction
Leg 142	Engineering Leg - East Pacific Rise
Leg 143	Atolls and Guyots A
Leg 144	Atolls and Guyots B
Leg 145	North Pacific Transect
Leg 146	Cascadia Accretion
Leg 147	Hess Deep or Engineering - EPR**

* If cleaning operations are successful on Leg 137
**If DCS Phase III System is ready.

In view of this schedule, PCOM created an Atolls and Guyots DPG to construct a two-leg drilling plan that maximized the scientific return for the two proposals under consideration. PCOM chose not to set up an Offset Drilling Work Group at this time, even though the recommendation had been made jointly by TECP-LITHP.

TAMU engineers reported that the DCS Phase II System, which incorporates a platform occupied by 3-4 drillers above the rig floor, raises some serious safety concerns, particularly in high temperature environments and in hydrothermal settings, where blow-outs and high H_2S concentrations are possible. Even though these concerns will be less serious once the DCS Phase III system is operational, the unlikelihood of achieving the scientific objectives for East Pacific Rise and Sedimented Ridges II drilling with the present status of technological development seriously impacts the planning process. In recognition of this problem, PCOM agreed to consider these two programs as high priorities for drilling, which should occur at the earliest possible date commensurate with technological development and ship scheduling, <u>assuming that the science remains a high priority for the thematic panel</u>.

PCOM also discussed the concept of Supplemental Science (or "Add-On") proposals and generally endorsed the recommendations of the PANCHM (see PANCHM report) for the implementation of such a program. This will begin in FY92 and has been advertised in EOS and the JOIDES Journal.

Another major activity of the meeting was the presentation of Annual Reports by the Panel Chairs (LITHP Annual Report is attached in Appendix I).

The purpose of the next PCOM meeting will be to advance the direction of the ship by one year, based on the global rankings of the thematic panels to be completed at the March meetings.

1.2 <u>PANCHM (S. Humphris)</u>

The PANCHM meeting which was held in November in Hawaii prior to the PCOM meeting addressed a wide range of topics, including proposal review and panel membership procedures, the need for flexibility in facilitating meetings of specialist groups, and the ODP Long Range Plan.

The most substantive issue concerned the requirements for Supplemental Science ("Add-On") proposals, which are encouraged for drilling that can be completed along the cruise track for a particular fiscal year. The following guidelines were suggested:

- The science must be exciting and consistent with ODP high priority objectives.

- The proposal must be mature and meet SSP guidelines.

- Operation time, including transits from the scheduled ship's track, must be only 1-4 days.

- Proponents should be prepared to serve in the shipboard party.

- Total Supplemental Science should not run to more than 12 days of operations in any fiscal year.

1.3 Ocean History Panel (G. Smith)

OHP met in early March at the University of North Carolina, Chapel Hill. The usual reports were presented (e.g., PCOM, TAMU, etc.). The two most important objectives of the meeting were planning the North Pacific Transect (for which OHP is functioning as a DPG) and ranking programs. The North Pacific Transect serves a variety of purposes. The primary one is a paleo-ocean/climate transect. A secondary goal is to obtain a basement age in two locations in the north central Pacific (NW-3&4) in order to distinguish between two Pacific plate reconstruction models (one which has only a single plate, and one with the proposed Chinook plate). Another objective is to drill into basement at several sites on the transect. Two of these sites are on seamounts and the remainder on normal Pacific crust. These basement sites are of some LITHP interest, especially Patton Murray seamount, which is at the old end of the Cobb-Eickleberg chain.

The basic problem is that one of the proposed sites (NW-1) was originally placed on the now defunct CEPAC Bering Sea leg, primarily for logistical reasons. It was thus necessary to reduce the leg length to the current ODP maximum.

The major modification to the leg was the elimination of one of the tectonic sites (NW-3). NW-4 was judged sufficient to resolve the plate reconstruction issue (with Rea, one of the proponents, concurring). The Detroit Seamount program was modified to eliminate deep penetration at the medium depth site (DS-2) and to add an additional APC site to provide a better depth transect. Basement penetration (bit destruction) on top of Detroit seamount was maintained. Significant basement penetration at the deep site (on normal Pacific crust) is debatable. I argued (after discussion with Bob Duncan) that LITHP was more interested in the seamount drilling than another small chunk of normal Pacific crust. Patton-Murray was left pretty much intact. It was originally slated for 50 m of basement drilling (or to bit destruction).

The most interesting site of the leg is Patton-Murray seamount which addreses the issue of long term evolution of seamounts. Detroit Seamount is close to Meiji and will probably not provide any major new information (especially with no more than

50 m of penetration). The major problem is that Patton Murray is the last site on the leg, which leaves the basement drilling here in an exposed position. Given the tight time constraints, LITHP should investigate the option of suggesting deeper penetration at Patton Murray (150 m?) while sacrificing other basement drilling as necessary.

The other major endeavor was ranking the twelve proposals judged interesting and sufficently mature. The proposals were divided into five groups (high frequency, low frequency, sea level, upwelling, and high latitude) and ranked within each group. The best of the top five was then chosen, the next in the group moved up and the process repeated. In order:

1. North Atlantic Gateways (305/320/336)
2. Miller, New Jersey Margin (348)
3. Angola/Namibia (354/339)
4. Ceara Rise (388)
5. Shatsky Rise (253 Rev)
6. S. Equatorial Atlantic (347)
7. Bering Sea (CEPAC/229)
8. California Current (386)
9. West Florida Margin (345)
10. Rifted Margins (DPG)
10. Ross Sea (296)
12. Jones Equatorial Atlantic (313)

The tie for tenth was resolved for Rifted Margins as it was judged more mature (and low enough on the list that it didn't really matter that much). The next meeting will be Oct. 1-3 and is proposed for Yamagata, Japan.

1.4 Tectonics Panel (J. Karson)

The tectonics panel is scheduled to meet next week in Davis, California. E. Moores is the new Chairman, and J. Karson is the new TECP liaison to LITHP. S. Cloetingh has replaced C. Mevel as the LITHP liaison to TECP.

1.5 Sedimentary and Geochemical Processes Panel (R. Zierenberg)

The SGPP meeting in March at College Station, TX was preceded by an ODP Gas Hydrate Workshop chaired by Keith Kvenvolden. General topics of discussion included:

1) The global distribution of gas hydrates (GH) and their role in the global carbon cycle.
2) The chemistry and physics of GH.
3) The geophysical signature of GH, in particular the evidence supporting the presence or absence of a free gas phase, and alternative models of formation

requiring upward advection of a methane-bearing fluid through the zone of GH stability verses subsidence of a sedimetary section containing biogenic methane produced in situ through the zone of GH stability.

4) The current status of the Pressure Core Sampler (PCS), including recommendations to PCOM to "revive" engineering efforts on both the PCS and a compatible sampling manifold.
5) Safety considerations of drilling through GH, including consensus views that neither overpressured gas or H_2S hydrates represent significant drilling risks in area where structurally trapped thermogenic gas is avoided.

The primary business of the SGPP meeting was the discussion of new proposals and a global ranking of proposals that addressed long range SGPP goals. The approach taken was to include both mature and immature proposals and to rank them for their potential to address SGPP priorities rather than to strictly evaluate proposals based on their content as submitted. The resulting ranking is more a reflection of where SGPP would like to see ODP science directed rather than a plan for upcoming drilling. As a result of this approach, in some cases the priorities cannot be strictly identified with a single (or in some cases with any) proposal, and those that do correspond to a proposal number may reflect SGPP's consensus on the potential for drilling in an area rather than the stated objectives of the proposal. The top 20 priorities of SGPP are as follows:

	Theme or Area	Associated Proposal
1	Gas hydrate	335
2	Mediterranean, sapropels	391
3	Sedimented Ridges II	DPG
4	New Jersey margin	348
5	VICAP (Canary Islands)	380
6	Cascadia II	DPG
7	Benguela upwelling	354
8	Sediment instabilities	59
9	EPR II	DPG
10	New Zealand sea level	337
11	Valu Fa sulfides	360
12	Ceara Rise	388
13	Return to 801	368
14	TAG hydrothermal	361
15	NW Australia	340
16	Mediterranean, Ridge	330
17	Barbados	378
18	South Australia margin	367
19	Gulf of California	275
20	North Atlantic evolution	372

The new SGPP liaison to LITHP will be J. Alt.

From an engineering standpoint, M. Storms indicated that more scientific input regarding the application of the Pressure Core Sampler (PCS) was required. It is likely that further development--specifically the method of transfer of the core at borehole pressures to a deck unit--will be put on hold until an individual with specific scientific interests is funded to continue this effort. The decision to put this project on hold is pending at PCOM.

1.6 Downhole Measurements Panel (written report from J. McClain)

The Downhole Measurements Panel met February 7 and 8 in College Station, Texas, preceded by a workshop on borehole stability in overpressured zones (see section 1.7).

A number of issues were addressed at the DMP Meeting that are of interest to LITHP.

1) The Geoprops Probe was successfully tested on land. DMP was encouraged and optimistic. However, they were adamant the tool must undergo substantial additional testing prior to deployment on the Cascadia leg. This will include additional land tests as well as at least one test deployment at sea.

2) The present Wireline Packer was judged by DMP to be an "engineering failure". The goal of the tool was to obtain uncontaminated downhole fluid samples, and this remains a critical goal for many upcoming programs. However, it is not clear that the Wireline Packer has any hope of accomplishing this task. In an excellent and useful report, the LDGO Borehole Geophysics Group (specifically Erich Scholz) evaluated the present system and presented three alternative plans. Their preferred plan was a nearly complete redesign and rebuilding program. This would cost about $250K. Their argument was based on what they interpret as the fundamental soundness of the Packer concept, but the fundamental engineering flaws of the present system.

   The response of the DMP was to recommend abandonment of the Wireline Packer. Several panelists argued that the Packer concept was flawed and "may never work". Others argued that starting over was essentially a new project, and alternatives should be explored first. The panel recommended that a "working group" or "workshop" be convened to address this critical issue. It was noted that $250K had already been lost on the present project.

3) It appears that some high-T downhole measurements will be made on LITHP relevant legs. The priorities are "temp.", "pressure", "fluid sampling", "formation resistivity".

   LDGO is negotiating a contract with JAPEX for their pressure, temp., and flow rate tool that apparently works. Negotiations with Sandia will proceed only if money is forthcoming for testing. A French temperature tool is also being investigated.

Fluid sampling tools from Los Alamos and Lawrence Berkeley Labs are scheduled for testing on Leg 137, and are being upgraded for higher temperatures.

A proposal from LDGO to purchase a slimhole tool for "formation resistivity". This tool would then be double-dwarded for high temperature work. This is a high-risk approach and was endorsed by the panel.

4) DMP endorsed a proposal to use a sodium bromide tracer on leg 137 at hole 504B to monitor downhole mixing in hole.

LITHP is concerned about the status of the Wireline Packer, which it views as critical to meeting the high priority objectives of several upcoming legs. LITHP endorses DMP's request for a group to be convened to address this issue, and stresses the urgency for the 1992 drilling schedule. In addition, high temperature capabilities need to be investigated.

1.7 Borehole Stability in Tectonically Active Areas Workshop (D. Moos)

The problems of hole instability during Legs 110 (Barbados Accretionary Wedge) and 131 (Nankai Trough) were addressed as they pertained to the upcoming drilling on Legs 141 (Chile Triple Junction) and 146 (Cascadia Margin). Traditionally, the problems have been related to swelling clays and sandy, unstable sections that slough off into the Hole. However, some information from Nankai suggested that breakouts resulting from the borehole stresses were the principal source of the hole sloughing problems. The solution used by the oil industry is to drill with weighted mud which adds radial stress and keeps the hole open. A number of strategies were discussed to enhance the prospects of logging under these conditions. Some of these were simply modifications of the drilling plans to case upper portions of unstable holes or drill offset dedicated logging holes. Others included the use of heavy muds weighted with barite. This strategy would be more expensive and would preclude the use of some logging tools (e.g. lithodensity measurements). A major recommendation is to devote a portion of a future engineering leg to evaluate borehole stability strategies in preparation for upcoming programs.

1.8 North Atlantic Rifted Margins DPG (from a draft Preliminary Report - H.C. Larsen)

The NARM-DPG was formed by PCOM at the request of LITHP and TECP in order to develop a scientific drilling plan to study rifting and the variations in continental break-up processes.

At its first meeting in February, seven proposals were considered--additional proposals currently under review by the thematic panels will be included at the next meeting.

The NARM-DPG considered various conjugate margin segments formed in association with the Early Cretaceous to Early Tertiary progressive break-up of the North Atlantic. They identified two end member modes of continental break-up in the region:

1) multiple rift, non-volcanic margins with wide zones of continental crust thinning
2) single to no pre-break up rift, highly volcanic margins with large volumes of extrusives during break-up and early spreading.

As first priorities, the DPG will probably recommend two transects representing these end members and requiring 6-7 legs of drilling time:

1) The North Newfoundland Basin - Iberia Abyssal Plain conjugate margins - this will provide a complete cross-section of the two possibly asymmetric margins.

2) The SE Greenland volcanic margin, which is conjugate to the DSDP-drilled Faroe-Hutton margin, supplemented with one drillsite on the outer Voring Margin to provide a longitudinal transect component.

An additional high priority objective is to drill the deep seismic reflectors (e.g. the S-reflector below Galicia Bank) if and when the drilling technology is available.

The DPG will be meeting once more in the fall to consider the new proposals under review and to finalize their recommendations.

LITHP reviewed the report and is in overall agreement with the selection of the high priority transects. However, the following concerns (which are based on review of a draft report without all the Figures and Appendices) need to be considered.

1) Early rifting and continental break-up processes are a fundamental problem of high interest to LITHP. The DPG needs to focus the program on well-defined, key questions that can be addressed by a drilling strategy.

2) LITHP believes that the question of the timing of rifting and magmatism is key to our understanding of rifting processes--drilling should specifically address this problem.

3) Testing of the volcanic plume model is of high interest to LITHP and should be incorporated into the drilling program.

4) There is a need to further develop quantitative models for basin extension that can be tested by drilling.

5) There is a large geochemical database available that could be used to set up testable models of magmatic evolution, and could help define where to drill--the DPG needs to fully investigate this prior to determining drilling locations. The involvement of petrologists who are concerned with the petrogenesis of basaltic rocks in both continental and oceanic environments is critical if drilling is to address not only the tectonics, but also the evolution of magmatism, during rifting processes.

In view of these concerns, LITHP recommends to PCOM that an additional petrologist be added to the NARM-DPG, and nominates A. Saunders (University of Leicester) for that position. In addition, Sierd Cloetingh will act as LITHP liaison to the NARM-DPG.

1.9 Atolls and Guyots DPG (from a Report - D. Rea)

The A&G-DPG met in Ann Arbor in late February with the charge to construct a two-leg drilling plan to include priority 1 and 2 targets of proposal 203-Rev. and additional targets of proposals 203-Rev. and 202-Rev. A report of the most recent guyot drilling at Site 831 on Bougainville Guyot, W. of the New Hebrides Trench was presented. Drilling at a lagoonal location penetrated about 750 m of Cenozoic reef rock with recovery rates of 5%. Based on this, the sites recommended by the DPG are either in a back reef setting or on the marginal reef itself, where better recovery might be possible.

Basement objectives of interest to LITHP are to:

a) define the age of the edifices and their paleolatitudes
b) define the geochemistry in regards to the broad Southern Hemisphere geochemical anomalies (DUPAL and SOPITA).

In addition, deeper drilling (300-400 m) at one site per leg was considered preferable to shallow penetration at several sites, as it would allow evaluation of the geochemical and isotopic evolution of magmas in several flows, and would provide enough inclination data to average out secular variations in paleolatitude determinations.

The major basement penetration is currently planned for Huevo and MIT Guyots, although basement will be sampled at a number of other locations.

LITHP reviewed these recommendations and suggests that the major rationale for deeper penetration at these sites is for paleolatitudes, which will determine the motion of the Pacific plates. Hard-rock orientation will be critical--can the Japanese 3-component magnetometer to be available on this leg be used for this purpose? Since MIT and Huevo Guyots are old, it is possible that drilling will not recover basalts with the DUPAL and SOPITA geochemical anomalies, which tend to be in rocks of intermediate to younger ages.

2.0 RESULTS OF RECENT CRUISES AND PLANS FOR UPCOMING CRUISES

2.1 Preliminary results of Leg 135-Lau Basin (J. Hawkins)

The objectives of Leg 135 were to deduce the geologic and tectonic history of the Lau Basin to gain a better understanding of how backarc basins evolve, and to address broader problems of crustal evolution that pertain to other intraoceanic trench-forearc-backarc systems. A drilling transect of five sites was originally planned to sample the backarc basin crust and the arc-forearc area of the Tonga Ridge.

The Lau Basin is actively spreading and separates the Lau Ridge from the Tonga Ridge. The Lau Ridge has an age of about 14 Ma and is the remnant arc of the trench-arc-backarc system related to the convergent plate margin of the Tonga Trench. The Tonga Ridge includes the presently active arc of basaltic volcanism. Two models have been proposed for the post-late Miocene Lau Basin. The original model (proposed by Karig) suggested that the Lau Ridge arc system split and the Lau Basin subsequently formed in the rifted area. More recently, a model has been proposed (by Hawkins and others) in which the rifting to form the Lau Basin was initiated in the forearc rather than in the Lau Ridge volcanic arc.

Sites 834 and 835 were located in the western Lau Basin about 100 km and 200 km respectively east of the Lau Ridge. The objectives of Site 834 were to sample the igneous rocks formed in the first 0.5 my. of crustal extension of the Lau Basin, and to determine the age of the beginning of opening of the basin. Drilling sampled a number of sills or flows intercalated with sediments and a thick section of supposed basement. Geochemically, these basaltic lavas were more similar to Lau Basin backarc crust than to Lau Ridge arc samples. Biostratigraphic and paleomagnetic data indicated an age of 5.6 Ma, suggesting the age of inception of spreading may be greater than around 5.6 Ma.

Site 835 was located on crust of about 3 Ma according to the magnetic anomaly patterns. The principal goals were to assess the age and chemistry of the basement rocks, and to determine their petrogenetic relationship to Site 834 rocks. Surprisingly, the basalts recovered showed a closer affinity to Lau Ridge arc samples, even though this site was closer (~80 km) to the propagating ridge of the Central Lau Spreading Center.

Sites 836 through 839 were drilled in the backarc basin close to the Lau Spreading Center on crust estimated to be less than 1 Ma. The igneous rocks recovered ranged from basalts to basaltic andesites, with an overall geochemical signature very similar to rocks of an island arc tholeiitic series. Of particular interest were the recovery of some samples with very high concentrations of Mg, Cr and Ni; these may represent near-parental magmas for some of the Lau Basin volcanic rocks with arc-like affinities.

Site 840 was drilled on the west flank of the Tonga Platform, which forms the southern crest of the Tonga Rift. It was designed to reach an acoustic unconformity of Miocene/Pliocene age, which was believed to be an event coinciding with the initiation of rifting and opening of the Lau Basin. Although drilling penetrated the reflector, no lithogic changes were observed at that depth, and drilling continued through turbidites and beds of volcanic breccia and conglomerate.

Site 841 was located on the forearc slope and unexpectedly drilled into a high-SiO_2 dacite. In the upper section of the hole, drilling encountered several hundreds of meters of volcanoclastic turbidites dating back through the Miocene with several basaltic andesite sills or dikes injected into this series. This was underlain by an Upper Eocene reef assemblage, and at about 600 mbsf, the high-silica, low potassium volcanic complex of welded tuffs and tuff breccias which had clearly erupted subaerially was encountered. This may represent the remnants of a silicic volcanic arc; however, such rocks are rare in the earliest stages of development in other intraoceanic island arcs.

One problem encountered on the cruise was that there was the limitation on XRF analyses and thin section production imposed by having only one technician on board. It is important on hard-rock legs to have sufficient personnel to provide adequate coverage of these two critical functions.

LITHP endorses the recommendation of the Shipboard Measurements Panel that shipboard technician coverage on hard rock legs be sufficient for the XRF, XRD and thin section facilities to be operational continuously throughout each day.

2.2 Plans for Leg 137--Return to Hole 504B (Engineering) (M. Storms)

The primary objective of this leg will be to attempt to clear out the Hole 504B in preparation for deepening during Leg 140. The 22 days on site will be devoted to downhole logging, clean-out operations, coring tests, and possibe contingencies.

In accordance with LITHP and DMP recommendations, a series of downhole measurements will be made prior to the clean-out operations. The casing will be inspected using the conventional casing-inspection logging tools and the borehole televiewer. If the casing is bad, it may be necesary to install a protective liner--such action would be deferred until Leg 140. LITHP had recommended that the liner be carried on Leg 137 so any hole repair could be completed on the Engineering Leg; however, due to financial and lead time considerations, this is not possible.

If clean-out operations are successful, the remainder of the leg will be devoted to deepening the hole and completing some coring tests with different types of hard-formation RCBs and new drill bits. One alternative system to be tested will be conventional oilfield diamond coring. This system is not wireline retrievable, so requires a round trip of the drill string to recover each core. However, this may not represent a major time loss as, by the time 30-60 ft. of core has been cut, it is likely that the bit needs to be changed requiring tripping the complete drill string. A new artificial diamond drill bit used by Amoco very effectively in shales and carbonates and now redesigned for crystalline rocks, will also be used. The original plan was to test one of the two bits during Leg 136 at the base of the Hole. However, one bit was lost at sea during the recent helicopter accident, so only one remains.

An additional test will be the inflation of a drillstring packer in the upper part of the hole to better document the changes in permeability. This will use conventional formation tests as well as a new flowmeter injection experiment.

In terms of contingencies, the first will be to run additional logs and downhole measurements before abandoning the Hole. If additional sufficient time (about a week) is available, one of the sites proposed for Leg 138 (Pacific Neogene transect) will be started. If only a few days are available, the investigations of the hydrogeochemistry of the sediments around Site 504 will continue with ACP and XCB coring at the site of greatest local heat flow.

There is some concern over the schedule in terms of gearing up after Leg 137 for either deepening Hole 504B or preparing for Hess Deep. If the viability of Hole 504B is not clear-cut during Leg 137, a decision to continue or to abandon future efforts at this Site needs to be made quickly. If this proves to be the case, LITHP will review the results of Leg 137 as soon as they are available and make a recommendation to PCOM regarding the future of Hole 504B.

2.3 Plans for Leg 139--Sedimented Ridges I (M. Storms)
(See Appendix II for overhead used)

A preliminary engineering and operations planning document has been prepared that addresses:

- the drilling environments likely to be encountered (as defined by the SRDPG report)
- the limitations of the current equipment in terms of meeting the science objectives
- the safety requirements as specified by Canada, ODP, and SEDCO
- the sampling/measurement tools required.

In addition, a high T/H_2S contingency plan has been prepared that includes safety both in the lab and on the rig floor.

All the planning documents have been reviewed by COGLA and by independent H_2S consultants.

Currently, the hardware necessary for drilling in this area is being evaluated. Specifically, it is likely that non-sealed ball-bearing bits which can withstand temperatures up to 400°C will be used rather than the current bits (which are good to only 180°C). High temperature seals will also be needed in the pressure core sampler (PCS). Borehole T will be monitored during drilling.

The motor-driven core barrel (MDCB) will not be used during Leg 139 not only because of the high T, but it also needs more testing. This means that this Leg will accomplish only the hydrological part of the experiment, because the MDCB is required to recover the top section of deposits, which is needed to study near-surface mixing, and alteration of sulfides and basalts. However, the MDCB is never effective down to 50m as the BHA system has to be buried to achieve the stability necessary to use the MDCB. It may be possible to piston core the material at the top of the section of deposits.

2.4 <u>Plans for Leg 142--East Pacific Rise (Engineering) (M. Storms)</u>
(See Appendix II for Overheads)

I. <u>Engineering Concerns</u>
About 35 days of on-site operations are scheduled for Leg 142. Although transit time is high, it can be used for setting up the DCS system.

The primary engineering goals for this leg are:

1) <u>to maximize coring time with the DCS system</u>
The statistics from Legs 124E and 132 show that experience actually coring with the DCS system is limited to 25 hours. The system is at a point where rotating

time is needed to prove its effectiveness, and for the drillers to gain experience using it. First and second-stage drill-in BHAs will be set to stabilize the new 3-leg guide base and to isolate the upper rubbly section.

2) to evaluate a new diamond core barrel (DCB) as an option to the second stage drill-in BHA system
This will be the first test of this bit for ODP purposes and, if successful, would allow core recovery in the upper section with a hole size of 7-1/4".

Leg 132 demonstrated the ability to pick up the guidebase and move it to a new location if drilling proved unsuccessful. This means that on Leg 142, it will be feasible to set the guidebase, attempt to drill in a minimum amount and then back-off; if unsuccessful, the guidebase can be moved. Hence, the spud-in tests that had to be completed on Leg 132 to establish the depth of the BHA will be unnecessary.

The preliminary operations plan calls for setting the mini hard rock guidebase and stabilizing the upper 10 m of rubble with the first stage drill-in BHA. Three options are then available:

- evaluation of the DCB to 50 meters with the RCB wireline system and cores of 2.31" diameter

- stabilization of the rubble zone to 50 meters with the second stage drill-in BHA without coring

- use of the DCS Phase II system with cores of 2.20" diameter in 10 ft. sections.

The overall penetration to be expected on this Leg is 100-200 mbsf.

This operation plan will allow a number of engineering developments to be evaluated that have included new design of some components as well as modification and upgrade of many others. Total funds allocated so far have been about $1.6 million, of which about $1.2 million have been spent on sea-floor structures (guidebase, BHA, etc.). Much of the effort has focussed on the new mini-hard rock guidebase, which now has 3 legs, and a reentry cone of 8' diameter (compared with 14' in the original guidebase), and a counter-balance gimbal system for the cone. With the smaller cone, it is now possible to see bullseyes on top of the cone with the TV, and the guidebase is also equipped with electronic tilt beacons. The nested drill-in BHA system is much the same as that used on Leg 132, and has the same back-off capability.

A number of bits will be evaluated, including a 2-cone bit, which has a 4" center hole. This provides another option for making hole in that this bit can be used to drill in and back off, and then the DCS system can be deployed through the 4" hole in the bit. Although this may cause some deviation of the hole, it could allow further penetration.

A number of modifications to the HQ DCS core barrel have been made so that a variety of samplers (eg. push sampler, piston-type sampler, etc.) can be deployed, and there is also more flexibility in the variety of core catchers available.

A developmental system for the CSG advancer latch for the drill-in BHA will be tested. The new system is made of high impact plastic and will provide a re-entry guide for the second stage BHA. The use of plastic may provide protection for the drilling bits during re-entry.

II. Scientific Concerns (S. Humphris)

The recent refraction data collected by M. Purdy and G. Fryer have resulted in a request from R. Batiza to PCOM to make EPR-2 (rather than EPR-1) the primary site for Leg 142. This is based on the fact that there are significant and systematic differences in the thickness of the low-velocity rubble zone, with evidence that the unconsolidated surficial layer doubles in thickness during the first 10,000 yrs. Within the axial summit graben, this layer is less than 100 m thick, and within 200 m, Vp is up to 5.5 km/sec, whereas, off-axis the rubble layer is 100-200 m thick. Given the previous lack of success in drilling young mid-ocean ridge sites (Leg 54 in the East Pacific Rise and Legs 106 and 109 on the Mid-Atlantic Ridge), and the urgent need to demonstrate that DCS drilling is a viable technique in such terrain (particularly as ODP comes up for renewal), it seems prudent to drill initially at the least problematic site from an engineering point of view.

LITHP reviewed the Cruise Report submitted by M. Purdy. The data and their interpretation are consistent with submersible observations at Hess Deep (on 1 myr old crust), where more than 200 m unconsolidated rubble is exposed overlying consolidated crustal layers, and on the Juan de Fuca Ridge, where the only rubbly areas in the central rift are highly localized collapsed lava lakes. Hence, it would appear that upper crustal drilling conditions might be more favorable in the axial summit graben, particularly if detailed *Alvin* surveys can determine and mark a visually promising site.

The highest priority for drilling, as outlined by the EPRDPG was to establish "a single deep hole near the ridge axis that penetrates as closely as possible to the top of the geophysically defined axial low velocity zone, which is interpreted to be the top of an axial magma chamber". The low velocity zone appears from the seismic data to be well-defined under both EPR-1 and EPR-2, so making EPR-2 the primary site does not compromise the highest priority. The overall plan calls for both holes to be drilled, with EPR-2 being drilled to only 500 m. In terms of meeting the hydrothermal objectives of EPR drilling, alteration may be better developed at EPR-1 (the off-axis site) so deeper penetration might be preferable. However, the most important requirement to look at fluid flow and fluid/rock interactions in the upper part of the crust is that both holes be drilled in a multi-leg program. Hence, it is critical that Leg 142 is successful to ensure the future of drilling in this region.

Given all of these considerations:

LITHP strongly supports the change in primary site for EPR drilling to the on-axis site--EPR-2--to be started during Leg 142. This recommendation is based on an examination of recent seismic data, consideration of the scientific objectives of EPR drilling, and the desire to select the least problematic drilling site to adequately test the DCS Phase II system for bare-rock drilling.

3.0 PROPOSAL REVIEWS

3.1 The following proposals were evaluated to not fall within the mandate of the LITHP:

Joides Ref. No.	Title	Author(s)
59-Add	Continental Margin Sediment Instability Investigation by Drilling Adjacent Turbidite Sequences	P.P.E Weaver and R.B. Kidd
247/E Add	Water Mass Conversion in the Glacial Subarctic Pacific (54°N, 148°W): Physical Constraints and the Benthic-Planktonic Stable Isotope Record	R. Zahn, T.F. Pedersen, B.D. Bornehold, A.C. Mix
345-Add	Drilling Proposal for the West Florida Continental Margin, Gulf of Mexico: Sea Level and Paleoclimatic History	Drs. J.E. Joyce, H.T. Mullins, L.R.C. Tjalsma, and S.W. Wise
363-Add	Paleooceanographic record at proposed drillsites NR1, NR2, and NR3	B. Tucholke
388	A Proposal to Advance Piston Core the Ceara Rise, West Equatorial Atlantic: Neogene History of Deep Water Circulation and Chemistry	Drs. W.B. Curry, J. Backman, N.J. Shackleton
389	Cretaceous N-S Traverse in the Western South Atlantic	B.A. Malmgren
391	Depositional History and Environment During the Formation of Sapropels in the Eastern Mediterranean	R. Zahn, E.A. Boyle, S.E. Calvert, F.G. Prahl, and R.C. Thunell
S-1	Documentation of Lithofacies and Depositional Cyclicity, Navy Deep-Sea Fan, California Borderland	D.J.W. Piper, M.B. Underwood, W.R. Normark

3.2 Proposal 323-Rev.
The Alboran Basin and the Atlantic - Mediterranean Gateway: Neogene Evolution of Continental Basement Overthrusting and Extension in the Alboran Sea and the Development of the Atlantic - Mediteranean (M.C. Comas, J.C. Faugere, J.A. Flores, V. Garcia-Duenas, M.J. Jurado, R. Kidd, J. Mackris, A. Maldonado, A.G. Megias, H. Nelson, F.J.Sierro, D.A.V. Stow, R. Stephenson, C. Vergnaud-Grazzini and J. Woodside)

The dynamics of rifting, and the tectonic evolution and subsidence history of the Alboran Basin are of interest to LITHP, but represent important objectives more directly related to the thematic concerns of TECP. A number of clarifications and additions to this proposal would be helpful. LITHP had some difficulty relating the proposed objectives to the specific holes to be drilled; there needs to be a more detailed description of how the proposed drilling will address the tectonic problems. For example, it is not clear how drilling will determine whether lithospheric deformation occurred by delamination or convective processes. In addition, some tectonic interpretation of information available from the many commercial drill holes in the area might strengthen the proposal.

Further development of the impact of drilling on understanding the nature of volcanism in the area is necessary. There is no mention of mineralogical or geochemical investigations of the volcanoclastics, which could potentially be most interesting, and are likely to be encountered in a number of holes. There is only one site (AL-1B) where substantial (100 m) basement penetration is proposed into a structural high. It is not clear that a single basement hole will meet the objectives defined in the proposal.

3.3 Proposal 334-Rev.
Galicia margin S reflector and ultramafic basement (G. Boillot, E. Banda, M. Beslier, and M. Comas)

This proposal addresses a number of LITHP objectives for understanding non-volcanic, stretched passive margins. Although drilling the S-reflector is important, LITHP's interest would be greater if drilling continued below this horizon. Of particular concern is the question of the regional continuity of the S-reflector--it is not clear that it can be traced seismically, particularly in a N-S direction. Hence the question arises as to whether one hole will be representative of this horizon. Site 1 is of interest, although it would help to obtain seismic refraction data prior to drilling in order to differentiate clearly between crystalline basement and syn-rift sediments.

It is also not clear from this proposal that drilling is needed to address the Site 2 objectives to determine the southerly extent of the peridotite ridge. Magnetic or seismic data might be useful. In addition, five days is an unrealistic time estimate to complete the proposed drilling and logging at this site.

Further interpretation of the data are needed--the cross-sections presented do not appear to restore successfully. Overall, this is an interesting proposal to drill in an excellent locality but additional seismic data might help better frame the problems that it tries to address.

3.4 Proposal 362-Rev.2.
Proposal for Scientific Ocean Drilling, Chile Margin Triple Junction, Southern Chile Trench (S.C. Cande, S.D. Lewis, G. Westbrook)

Sites SC-3, 4, and 5 address high-priority objectives of hydrothermal circulation and crustal accretion (mid-ocean ridge volcanism); however, this component of the proposal is currently not well-developed. While the proposal is written primarily to evaluate forearc evolution, from a LITHP viewpoint the Chile triple junction offers a unique natural laboratory to evaluate the effect on crustal genesis (and magma plumbing) from covering the crust with a thermal blanket of sediments. The proponents are encouraged to consider expanding their investigation of Site SC-3 with this viewpoint in mind. Similarly, to place the drilling results into context, it will be necessary to perform a great deal more water column work.

Site SC-6, on the Taitao ridge, would be of interest to LITHP if a second leg for this program is warranted. While the process of ophiolite emplacement is important to LITHP, the proposed drilling will provide limited information in this regard. Dating the basement rocks and determining their geochemistry will help constrain the origin of Taitao ridge, and will date the sediments overlying the ridge. It is not clear, however, that these samples could not be obtained from either dredging or submersible. Also, additional geophysical data are necessary to better constrain the subsurface geometry of the proposed "ophiolite" body.

3.5 Proposal 365-Rev.
Conjugate Passive Margin Drilling--North Atlantic Ocean (J. Austin, G. Boillot, M.C. Comas, A. Grant, F. Gradstein, L. Jansa, C. Keen, K.E. Louden, P.R. Miles, J.C. Sibuet, S.P. Srivastava, B.E. Tocholke, and R.B. Whitmarsh)

This proposal to investigate processes associated with continental rifting is of high interest to LITHP and is certainly mature! The southern transect addresses objectives of greater importance to LITHP than the northern transect. Of particular interest are the objectives at the presumed peridotite ridge (IAP4) and the conjectured continental (?) crust at NB3; this site could be either continental or oceanic, depending on the position chosen for the OCB.

Drilling of the southern transect is estimated to require about 3-1/2 legs to complete 3 holes on each margin. LITHP suggests that the proponents consider whether some time savings can be made by drilling without coring where the objectives in the sediment column can be addressed with logging--for example, in modelling subsidence history and basin reconstruction. In addition, industry drilling results could perhaps be used to extend heat flow data.

3.6 Proposal 390.
Proposals for the drill sites location in the Shirshov Ridge region (Bering Sea) (V.E. Milanovsky and Y. Neprochnov)

LITHP considered this proposal very immature at this stage but noted that there was general LITHP interest in this area. The panel suggests that the proponents use other mature proposals that have been submitted as models for the type of proposal they should resubmit. In particular, they should detail the results of recent geophysical and geological surveys and clearly discuss the objectives they hope to meet by drilling. They should note that there have been previous proposals to drill in the region and that there are difficulties in drilling deep holes at this time, particularly in view of the thick Neogene sedimentary cover. Site selections and depths of drilling required should be well-documented in the revised proposal.

3.7 Proposal 392.
A Mantle Plume Origin of the North Atlantic Volcanic Rifted Margins: Testing the Model Against Geological Data (H.C. Larsen, J.A. Chalmers, L.M. Larsen, A.K. Pedersen, N. Hald, C. Keen, S.P. Srivastava, K.G. Cox)

This proposal addresses high priority LITHP objectives--namely, the nature of magmatism and its relationship to tectonic extension at a volcanic rifted margin (VRM). The following deficiencies need to be addressed:

1) A depth of penetration of 1000 m into basement is proposed for Site LABS-1. This would require a complete drilling leg be devoted to this hole; more justification is needed for LITHP to support this site.

2) The interpretation of the seismic data to indicate the "peridotite ridge" at proposed site LABS-5 is uncertain. Perhaps other types of geophysical surveys (e.g. bottom gravity?) may help resolve this structure and strengthen the argument to drill at this location.

3) There is a need for the formulation of a testable model using existing

geochemical data, either from this region or from analogous margins in the North Atlantic.

Overall, LITHP strongly supports the scientific objectives and would like to see them integrated with other NARM proposals.

3.8 Proposal 393.
Drilling the Continent-Ocean Transition on the SE Greenland Volcanic Rifted Margin: Linking Continental Flood Basalts to Seaward Dipping Reflector Sequences (H.C. Larsen, T.D.F. Nielsen, L.M. Larsen, C.K. Brooks, K.G. Cox, A.G. Morton, B. Larsen)

Although quite immature, this proposal to investigate the igneous and tectonic processes at the continental-oceanic lithosphere transition is important for LITHP, and its objectives should be integrated with other proposals for this region. The major criticism of this proposal is that there is no presentation of a geochemical model that can be tested. There is considerable data from this region, both from land-based field studies and previous drilling legs, which is not discussed or used to constrain the possible models. In addition, the need for Site SEG-1 needs to be more fully justified--its proximity to land raises the issue as to whether some of the objectives could not be met by drilling on the continent.

3.9 Proposal 394.
Evolution of pre- and syn-volcanic extensional basins on passive volcanic continental margins (L.V. Kiorboe, K. Gunnarson, M.S. Andersen, and L.O. Boldreel)

This proposal primarily addresses themes within the mandate of the Tectonics Panel, but potentially addresses area of thematic interest to the Lithosphere Panel (LITHP). In particular, drilling of seismic unit three interpreted to be syn-rift volcanic rocks, is of interest to LITHP, but scientific objectives that could be met by sampling these rocks are not well developed. The continuity and relationship of seismic unit 3 to well-developed seaward dipping seismic reflectors (SDSR) to the west is not described in detail. Specific geochemical models to be tested by the drilling are not presented. Expansion of this area of the proposal might increase LITHP interest in this proposal, especially how drilling volcanic rocks at this site relates to the larger problem of volcanic rifted margins. This proposal should be considered by the North Atlantic Rifted Margins Detailed Planning Group as part of an integrated approach to passive margin drilling.

3.10 Proposal 395.
Post-Breakup Compressional Tectonics on a Passive Volcanic Continental Margin

(L.O. Boldreel and M.S. Andersen)

This proposal suggests an interesting approach to investigating post-break up deformation--using basins to date deformation and, by implication, to understand internal deformation of the Eurasian plate and its relation to plate motion changes.

As presented, this proposal is too local in its scope, and needs to be defined in terms of the regional North Atlantic geology. Is this an isolated feature, or is it an example of structures that are widespread and regionally significant? It is not clear that the program is optimal to address the objectives--the justification from the bathymetric and geophysical data is not well stated.

If drilling in this area, together with other geophysical evidence, can be used to tie down the internal deformation of plates and its relation to plate motion, this would be a very interesting target of secondary interest to LITHP, but probably of high interest to TECP.

3.11 Proposal 396.
Testing of the Hot-Spot Model for the Origin of Volcanic Passive Continental Margins (M.S. Andersen)

The existing geophysical models (plume vs. convective melting) proposed for the formation of Atlantic-type volcanic passive margins are not well-constrained by the current data base. This proposal, although rather preliminary, presents a good justification for testing the plume model by drilling a "transect" of holes over a broad geographic area.

This is a fundamental problem of high interest to LITHP. The proponents need to evaluate the existing "Faroe" petrologic data, and also show how any geochemical data acquired from drilling can be effectively used to constrain the petrogenesis of the volcanics associated with North Atlantic volcanic rifted margins.

3.12 Proposal 361-Rev.
A proposal for drilling an active hydrothermal system on a slow-spreading ridge: MAR 26°N (TAG) (G. Thompson, et al.)

This proposal directly addresses high priority objectives of LITHP, COSOD II and the ODP Long Range Plan, and is strongly supported by LITHP. The proposal stresses the hydrothermal/mineralization aspects of the region and is fairly mature; however, some important structural/tectonic/magmatic aspects were not covered or discussed in sufficient detail. There is no discussion of the basalt petrology or the potential interrelationship of volcanic and hydrothermal processes in the TAG area.

For example, is there evidence for later "off axis" volcanic activity and is it chemically distinguishable from earlier activity? There is also great concern about the ability to properly site drill holes to best address objectives 2, 3, and 4. The drilling locations for priority 1 are presented with respect to a model. The detailed geologic relationships that lead to the model should be presented for consideration. Every attempt should be made to obtain further detailed site survey information, particularly as regards structural and hydrologic control of the hydrothermal system.

Perhaps the UW hard rock drill could be used to obtain a number of shallow holes in the upper sections before ODP drilling.

LITHP is also concerned with the relative importance of shallow (<200 m) and deep holes in the area. Deep drilling is necessary to address changes in T, fluid flow and mineralogy with depth. Although a great deal can be learned from the proposed holes, it is likely that more deep drilling will eventually be needed to understand the system, particularly as it is a prime locale to evaluate the evolution of ophiolite-type massive sulfide deposits.

There is concern that Phase III of the diamond coring system (DCS) will not be available to optimize the return from drilling, but the opportunity for drilling in the TAG area should not be missed even if the DCS is not available. Finally, there was discussion of the desire for extensive drilling on a slow spreading center to complement planned EPR drilling. It would be desirable to present TAG drilling as one aspect of a longer range plan to understand crustal accretion and evolution at slow spreading ridges.

4.0 UPDATE ON ENGINEERING DEVELOPMENTS (M. Storms)

A detailed description of the current configuration of the DCS Phase II system was presented. Recent modifications have been made to the mini hard rock guidebase and the re-entry cone which have resulted in the capability to build the entire assembly in the moon pool area. The total new guidebase assembly weighs about 150,000 lbs. The limitations of the DCS Phase II system include the need for a drilling platform above the rig floor. as well as the headroom problem which can accommodate only a 10' core barrel.

A feasibility study for the Phase III system--in which drilling operations are brought down to the rig floor--is in the initial stages. It is estimated that 18-24 months will be required to develop the Phase III system after the feasibility study is completed. Hence, it should be ready for scientific use by late 1993.

LITHP is concerned with the current communication mechanisms that exist between the panel and ODP Engineering activities. Over the last year, a number of decisions have been made and actions taken (or not taken) by ODP-TAMU concerning further progress in developing drilling technology that have not been conveyed to LITHP--the panel most seriously affected by such changes in terms of realistically planning future drilling strategies. It is critical that concerns arising during engineering development that require a deviation from the projected implementation plans be communicated to LITHP, so the Panel can make informed decisions on their high priority objectives to be met within a given time frame.

The presence of an ODP Engineer at the LITHP Meetings has always proved to be extremely valuable, not only in providing an education in drilling systems currently in use and proposed for the future, but also as a reality check in terms of the time necessary for each step required to advance the drilling capabilities to meet objectives within LITHP's mandate. However, ODP Engineers are not present at all meetings and, although the ODP Liaison can bring information from them, questions and concerns always arise that cannot be addressed directly.

Hence, given the sensitivity of LITHP decisions concerning scheduling of high priority drilling programs to the timeliness of engineering developments, LITHP requests that an ODP Engineer attend both of its meetings each year.

5.0 Ranking of Proposals

LITHP identified twenty-nine programs (with associated proposals) that address high priority objectives and are of interest to the panel. These are listed in Appendix III, grouped according to themes or topics. No topic was included for which a proposal did not exist; hence, although a continuous section of oceanic crust remains a major goal, it could not be included in the rankings. In addition, it did not seem realistic to include it when the technology is unlikely to have advanced sufficiently to achieve such an objective in the time-frame for which the ranking was being done (i.e. one year beyond the current drilling schedule).

Once the programs to be ranked had been identified, each panel member assigned their top ten priorities, awarding 10 points to their highest ranked program, 9 points to their second highest program, etc. Proponents on proposals were not permitted to include their own proposals in their rankings. This procedure was carried out with the understanding that, should ambiguities arise due to the variation in the number of panel members permitted to vote on each proposal, a second round of voting would be conducted: this proved unnecessary.

The total numbers of votes for each program are shown in Appendix III. For brevity, only the top ten highly ranked programs are listed below:

Rank	Program/Theme	Proposal #	Area	Total Votes
1	Offset drilling: Layer 2/3, etc.	375-Rev.	Hess Deep	106
2	Hydrothermal processes at slow spreading ridge	361/A	TAG	78
3	Axial crustal drilling-- EPR II	EPRDPG Report	EPR, 9°30'N	75
4	Volcanic rifted margins	392-396	N. Atlantic	62
5	Sedimented Ridges II	SRDPG Report	Escanaba Trough	45
6	Layer 2/3, Layer 3/ mantle transitions	376/A, 382/A	Vema FZ	45
7	Upper mantle	369/A	MARK area, MAR	43
8	Non-volcanic rifted margins	334-Rev., 365-Rev., et al.	N. Atlantic	29
9	Hydrothermal processes at medium spreading ridge	325/E	Endeavor Ridge	26
10	Oceanic plateaus	142/E-Rev.	Ontong-Java	21

A number of comments need to be made concerning some of the programs considered and the overall rankings:

1) There are now three programs within the top seven that relate to offset drilling strategies. We also have the first leg to Hess Deep on the 1992 schedule, and offset drilling is specifically mentioned in the ODP Long Range Plan. It is absolutely critical that a drilling program be formulated to use this strategy to best achieve our scientific objectives and optimize the scientific returns. This is not a project that can be undertaken by one, or a combination of, thematic panels. Individuals with expertise in the likely geophysical and geochemical structure of lower crustal and upper mantle layers is necessary, as well as others who are familiar with the tectonic settings of the proposed areas.

   LITHP once again strongly urges PCOM to create an Offset Drilling Working Group to establish and prioritize the scientific objectives of a program for drilling offset sections of the crust and upper mantle. It is

critical that this begin as soon as possible in order that a program be formulated for implementation within the upcoming drilling schedule.

LITHP would also appreciate consideration of the objectives to be outlined in the WG's mandate, and the suggestions for membership, as submitted in the LITHP minutes from last November.

2) EPR II and Sedimented Ridges II both continue to be highly ranked programs. LITHP is gratified that PCOM has recommended that these be drilled at the earliest possible date commensurate with technological progress and ship scheduling.

3) Drilling into old Pacific crust (proposal #368/E) ranked as LITHP's eleventh priority. However, there is considerable LITHP interest in returning to Hole 801C to complete detailed logging in the basement section.

4) The Red Sea is a region of high scientific interest to LITHP. There are at least three proposals to drill there; however, such a program was not included in the rankings because of the concerns over whether research clearance could be obtained to drill in the region.

LITHP requests an update from PCOM and/or ODP concerning the status of obtaining research clearances in the Red Sea, and advice as to whether drilling in this region can now be considered.

6.0 LONG-TERM PLANNING

6.1 Deep Drilling

Deep crustal drilling continues to be a high priority for LITHP. In response to a request from the Deep Drilling Working Group, who met last September, LITHP devised six "example sites" of prospective drilling locations, with details of anticipated lithologies, temperatures, permeability, etc. These "example" sites included:

1) zero age crust - fast spreading
   - slow spreading

2) off axis crust - fast spreading
   - slow spreading

3) subduction zone - forearc crust

4) passive margin - seaward dipping reflectors

C. Sparks (TEDCOM Chairman) has requested that these examples be narrowed down to one or two high priority examples.

LITHP believes that it is ultimately going to be critical to drill deep holes at a number of sites in order to understand lithospheric processes. It is likely that several deep holes in fast and slow spreading environments, together with a deep off-axis hole tied to a moderately deep on-axis site to study changes due to alteration, will be necessary.

Clearly, achieving these objectives is a long way off, and may or may not be reached using the current drilling vessel. However, it is important that the objectives of scientific drilling programs proposed for the next few years continue to push technological developments towards deeper drilling capabilities. **Hence, LITHP's short-term strategy will include drilling a scientifically sound program of intermediate (2-3 km) depth holes to maximize the present vessel's capabilities, to advance the technology, and to increase knowledge of the challenges to be faced in very deep drilling.**

For planning purposes for TEDCOM and ODP, LITHP has developed a single "ocean crust" site, that uses information from Holes 504B and 735B. The final version will be approved by all LITHP panel members before submission to TEDCOM and the JOIDES office.

6.2 ODP's Long Range Plan

LITHP continued to address PCOM's charge to consider development of implementation plans for the Long Range Plan. The major objectives of interest defined at the last meeting have been assessed in terms of:

- current status
  - submitted proposals
  - WG or DPG
  - technology

- requirements for implementation
  - other necessary proposals
  - new WG or DPG
  - technological developments
  - other (e.g. site survey, interpretation of available data, etc.)

An additional objective--Structure and Dynamics of Rifted Margins--has also been included. This is likely to be of significant interest to TECP; however, LITHP is concerned with studies of the amounts of extension and associated volcanism in different tectonic regimes.

7.0 OTHER BUSINESS

7.1 Panel Replacement

M. Perfit is due to rotate off LITHP. Mike has provided a great deal of help, and LITHP thanks him for his dedicated service.

LITHP recognizes that the panel needs an individual with expertise in the geology and geochemistry of lower crustal/upper mantle layers, and unanimously nominates:

S. Bloomer (Boston University)

as the replacement for M. Perfit. (Sherm has been contacted, and is willing to serve.)

7.2 LITHP liaisons and representatives on working groups

The following is a complete list of LITHP liaisons to other panels, Working Groups, and Detailed Planning Groups:

OHP - G. Smith
SGPP - R. Zierenberg
TECP - S. Cloetingh
TEDCOM - D. Moos
DMP - J. McClain

NARM-DPG - S. Cloetingh
Sea Level Working Group - S. Cloetingh
Atolls and Guyots DPG - T. Brocher

Offset Drilling WG - J. Phipps-Morgan (if this WG is established)

7.3 Next meeting

The next LITHP meeting will include a joint session with TECP, and will be held on 9-11 October 1991 in Cyprus.

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Appendix I.

JOIDES Lithosphere Panel FY'90 Annual Report

The JOIDES Lithosphere Panel (LITHP) has met twice in the last year: once in March in New Orleans, where a joint morning session was held with the Tectonics Panel (TECP), and more recently in October. Our activities are documented in detail in the minutes from those meetings.

A number of important steps have been taken in the last year to begin to address LITHP's long-term goals that were outlined in our 1988 Long-Range Planning Document. In order to address our overall thematic objective of understanding the structure and composition of the oceanic crust and upper mantle, the lithosphere community now recognizes that both a complete crustal section and a program of offset sections of the lower crust and upper mantle are necessary. In the last year, progress has been made in both areas:

1) **drilling a complete crustal section** - this continues to be a critical long-term goal of LITHP and, based on the recommendation that resulted from the joint LITHP-TECP meeting in March, PCOM has created the Deep Drilling Working Group to identify the technology needed and to examine the strategies required to achieve this objective.

2) **drilling offset sections** - in the shorter term, drilling offset partial sections of the lower layers of the oceanic crust affords a way of characterizing parts of the crust using more immediately available drilling capabilities. Much of the interest in this strategy was generated by the DOLCUM workshop held 18 months ago, and a number of proposals have been submitted in the last year to use offset drilling in a number of different tectonic settings.

   LITHP is now urgently recommending that PCOM establish a working group to prioritize the scientific objectives that can be realized by offset drilling, and to determine a drilling program to meet the goals that are set.

In the last year, we have seen an initial step taken towards our goal of establishing global seismic arrays with the scheduling of the pilot hole off Hawaii. LITHP is very much aware that the most effective way to continue installation of new observatories is as an integral part of the ODP Long Range Plan so that all drilling sites that are in appropriate locations to become part of the seismic array, be equipped with re-entry cones when initially drilled. This requires, in the short term, identification of appropriate locations and, in the long term, continued monitoring to ensure re-entry cone installation in all potential observatory sites.

Other important highlights of the year include the formation of two Detailed Planning Groups to formulate drilling programs for the East Pacific Rise (this is already completed) and for North Atlantic Rifted Margins. In addition, LITHP is encouraged with the progress being made in locating or developing high temperature and slimhole logging tools, and wishes to stress that the success of LITHP's drilling programs next year depends on at least the basic suite of tools previously defined being available.

A major activity at both meetings has been ranking proposals, first in order to provide input to determine the track of the vessel through 1994 and, more recently, to prioritize the proposals in the Pacific Prospectus. In this report, I will present only the latter. Only six of the nine programs in the Pacific Prospectus were included in our rankings, and these fell into two clearly separated groups. The top three - EPR Bare Rock Drilling, Hess Deep, amd Sedimented Ridges II - received notably higher ratings (in fact, all but one of the 1st, 2nd, and 3rd place votes). Each of the top three addresses high priority LITHP objectives and hence are all critical to achieving our goals. EPR drilling has been a long-standing very high priority of the Panel in its efforts to obtain crustal sections of new oceanic crust. Sedimented Ridges II addresses fundamental hydrogeological and geochemical problems in hydrothermal systems and is essential to the overall Sedimented Ridges program that has been formulated. Hess Deep, by comparison, is a relatively new proposal, but provides an exciting opportunity to investigate the lower crust and upper mantle at a fast-spreading ridge. LITHP feels that we need to demonstrate success in addressing lithospheric problems and these three programs are critical in that effort.

ODP ENGINEERING AND DRILLING OPERATIONS

HIGH TEMPERATURE DRILLING/H_2S PLANNING

LEG 139 SEDIMENTED RIDGES I

* A PRELIMINARY ENGINEERING AND OPERATIONS PLANNING DOCUMENT HAS BEEN PREPARED
  * ENVIRONMENT DEFINED
  * EQUIPMENT LIMITATIONS IDENTIFIED
  * SAFETY REQ'MTS (CANADA/ODP/SEDCO) IDENTIFIED
  * DESCRIPTION OF SAMPLING/MEASUREMENT TOOLS
* A HIGH TEMP/H_2S CONTINGENCY PLAN HAS BEEN PREPARED
  * INCLUDES LAB/RIG FLOOR SAFETY
* ALL PLANNING DOCUMENTS HAVE BEEN REVIEWED BY COGLA AND BY INDEPENDENT H_2S CONSULTANTS

LEG 142 EAST PACIFIC RISE

* COMPUTER MODELING OF POTENTIAL STEAM FLASH CONDITIONS HAS BEEN CONDUCTED (ENERTECH)
* HIGH TEMPERATURE/H_2S REGIMES SHOULD BE AVOIDED AS MUCH AS POSSIBLE.
* A TUBING BOP WILL BE MOUNTED BELOW THE DCS PLATFORM FOR LEG 142 DCS/EPR OPERATIONS.
* THE PHASE III DCS (RISER TENSIONER CONCEPT) SYSTEM IS CONSIDERED VASTLY SAFER FOR DCS DRILLING IN HIGH TEMPERATURE REGIMES.

000270

SUMMARY OF DCS OPERATING TIME
(LEGS 124E AND 132)

LEG 124E STATISTICS

(BASED ON 16.5 DCS OPERATING DAYS)

* DCS OPERATIONS DERRICK/RIG FLOOR[1,2] 44%
* DCS CORING TIME[3] 5%

 20 HOURS TOTAL OF WHICH 5 HOURS IS CONSIDERED EFFECTIVE CORING TIME.

LEG 132 STATISTICS

* DCS OPERATIONS DERRICK/RIG FLOOR[1,2] 38%
* DCS CORING TIME[3]

 20 HOURS EFFECTIVELY CORING (2 BIT RUNS)
 79.6 METERS CORED

FOOTNOTES:

1 - EXCLUDES CORING TIME.

2 - INCLUDES DCS TRIPPING, MAST/PLATFORM RIG UP, DCS COMPONENT CHECK OUT AND FUNCTION TESTING.

3 - INCLUDES WASH CORING, WIRELINE TIME, AND DRILLING AHEAD TIME.

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

LEG PARAMETERS

IN PORT VALPARAISO, CHILI	JANUARY 13-17, 1992
DEPART VALPARAISO, CHILI	JANUARY 18, 1992
TRANSIT TO EPR-1	13.2 DAYS
OPERATIONS ON SITE EPR-1	34.6 DAYS
TRANSIT TO HONOLULU, HAWAII	13.2 DAYS
ARRIVE HONOLULU, HAWAII	MARCH 19, 1992

TOTAL DAYS IN PORT	5.0
TOTAL TRANSIT DAYS	26.4
TOTAL DAYS ON-SITE	34.6
TOTAL DAYS ON LEG	66.0

000272

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

PRIMARY ENGINEERING GOALS

* THE ABSOLUTE NUMBER ONE PRIORITY FOR LEG 142 IS TO: MAXIMIZE CORING TIME WITH THE DIAMOND CORING SYSTEM.

* TO ACCOMPLISH THIS TASK A NEW 3-LEG/HEX SIDED HARD ROCK GUIDE BASE WILL HAVE TO BE SET AND THE UPPER "RUBBLY" SECTION ISOLATED BEHIND THE FIRST AND/OR SECOND STAGE DRILL-IN-BHA.

* A NEW DIAMOND CORE BARREL (DCB) WILL BE EVALUATED AS AN OPTION TO THE SECOND STAGE DI-BHA SYSTEM. SHOULD CORING WITH THE DCB PROVE UNSUCCESSFUL THE 2ND STAGE DI-BHA WILL BE DEPLOYED.

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

SECONDARY ENGINEERING GOALS

* TEMPERATURE/CALIPER LOGS IN 7.25" DCB HOLE
* TEMPERATURE/CALIPER LOGS IN 3.96" DCS HOLE

NOTE:

A SECOND HARD ROCK GUIDE BASE (HRB) MAY BE DEPLOYED BUT ONLY UNDER THE FOLLOWING CONDITIONS:

(1) THE INITIAL HRB/HOLE IS LOST AND DEEMED UNRECOVERABLE.

(2) CONTINUED CORING OPERATIONS ON THE INITIAL HOLE ARE PREVENTED DUE TO TEMPERATURE CONCERNS.

(3) DCS CORING AHEAD OF SCHEDULE AND CANNOT CONTINUE DUE TO OTHER CONSTRAINTS SUCH AS DRILL ROD SHORTAGE, OR MECHANICAL MALFUNCTION.

000274

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

SPECIFIC ENGINEERING GOALS

* EVALUATE PLATFORM MODS
    * IMPROVED DCS WINCH/TUGGER CONTROL SYSTEM
    * EVALUATE SECONDARY HEAVE COMPENSATOR MODS
    * EVALUATE LOW FRICTION SEALS F/HYD FEED CYLINDERS
    * EVALUATE HIGH PRESSURE POWER PACK FILTER SYSTEM
* EVALUATE NEW MINI HRB HEX DESIGN
    * 3 LEG/HEX SIDED DESIGN
    * COUNTER BALANCE GIMBAL ELIMINATES FLOATATION
    * 8 FT DIAMETER REENTRY CONE
* EVALUATE NESTED DI-BHA SYSTEM
* EVALUATE DCB, 1ST/2ND STAGE DI-BHA BITS, AND CTR BITS
    * 2-CONE, 4-CONE, 6-CONE HYBRID TCI BITS
    * IMPREGNATED/CARBONADO DIAMOND BITS
    * 1-CONE, AND 2-CONE CENTER BITS
* EVALUATE MODS TO HQ DCS CORE BARREL
* EVALUATE CSG ADVANCER LATCH F/DI-BHA CENTER BIT
* EVALUATE RE GUIDE/DEPLOYMENT ASBLY F/DCB & DI-BHA
* EVALUATE HQ C'BBL SAMPLING OPTIONS (AS REQUIRED)

LEG 142 EAST PACIFIC RISE

ENGINEERING LEG III

PRELIMINARY OPERATIONS PLAN

* DEPLOY MINI HARD ROCK GUIDE BASE AT EPR SITE

* STABILIZE UPPER 4-10 METERS OF RUBBLE ZONE

    * WITH 1ST STAGE DRILL-IN-BHA
    * HOLE SIZE 11.25" TO 12.25", CTR BIT/NO CORE

* EVALUATE DIAMOND CORE BARREL (DCB) TO 50 METERS

    * WITH RCB WIRELINE C'BBL SYSTEM AND DIAMOND BIT
    * HOLE SIZE 7.25", CORE SIZE 2.31" X 30.0'

* STABILIZE RUBBLE ZONE TO 50 METERS

    * WITH 2ND STAGE DRILL-IN-BHA
    * HOLE SIZE 7.25", CTR BIT/NO CORE

* DIAMOND CORING (DCS PHASE IIB SYSTEM)

    * WITH HQ C'BBL SYSTEM, DIAMOND BIT
    * HOLE SIZE 3.96", CORE SIZE 2.20" X 10.0'

* ACHIEVE PENETRATION WITH DCS OF 100-200 MBSF

000276

ODP ENGINEERING AND DRILLING OPERATIONS

DEEP DRILLING REQUIREMENTS AND PLANNING

- JOIDES PANELS HAVE BEEN ASKED FOR INPUT ON DEEP DRILLING REQUIREMENTS/GOALS (GENERIC SITE ???).

- TEDCOM PANEL HAS DISCUSSED TASK AND WILL PROVIDE INPUT TO ODP AFTER DRILLING GOALS HAVE BEEN DEFINED.

- INTERNAL ACTIVITY HAS CONCENTRATED ON:

  - DEFINING CURRENT VESSEL/TECHNOLOGY/HARDWARE LIMITATIONS.

  - IDENTIFYING POSSIBLE SYSTEMS TO BE USED, MODIFIED FOR POTENTIAL USE, ETC. (I.E. TRIPLE CASING STRING, DCB, CONVENTIONAL CORE BARRELS, ETC.)

- TIME ESTIMATING HAS LIMITATIONS BECAUSE TECHNOLOGY, HARDWARE, TECHNIQUES, AND DRILLING REQUIREMENTS ARE PRESENTLY ILL DEFINED.

Appendix III. Proposals Included in the Ranking

Program/Theme	Proposal #	Area	No. of Votes
DEEP DRILLING			
Layer 2/3 transition and other offset sites	375-Rev.	Hess Deep	106
Upper Mantle	369/A	MARK area, MAR	43
Layer 2/3, Layer 3/ mantle transitions	376/A and 382/A	Vema FZ	45
Upper mantle	374/A	Oceanographer FZ	15
Layer 3	352/E	Mathematician Ridge	2
Layer 3/ mantle transition-- extinct ridge	300/B	Site 735B, AII FZ	18
Mantle-back arc basin	379/B	Tyrrhenian Sea	10
RIDGE CREST/HYDROTHERMAL PROCESSES			
EPR II	EPRDPG Report	EPR, 9° 30'N	75
Sedimented Ridges II	SRDPG Report	Escanaba Trough	45
Hydrothermal-slow spreading ridge	361/A	TAG	78
Hydrothermal-medium spreading ridge	325/E	Endeavor Ridge	26
Zero age crust/extinct spreading ridge	331/A	Aegir Ridge, Norwegian Sea	7
Hydrothermal/back arc basin	360/D	Value Fa Ridge, Lau Basin	8
Extinct hydrothermal system	319/E Rev.	Galapagos	5
Transform-dominated ridges	333	Cayman Trough	1
OLD OCEAN CRUST			
Return to 801C	368/E	NW Pacific	19
Cretaceous volcanism	343/E	Caribbean Sea	0

000278

<u>HOT SPOT/SEAMOUNT</u>			
Early hot spot evolution	252/E	Loihi Seamount	13
Near axis seamount	290/E	Axial Seamount	13
Temporal evolution of hotspots	291/E	Marquésas	3
VICAP	280/A-Rev.	Canary Islands	7
<u>CONVERGENT MARGINS</u>			
Ridge-trench collision	362/E Rev.	Chile Triple Junction	15
Back-arc tectonics	390	Shirshov Ridge, Bering Sea	2
Geochemical reference hole	267	W. Pacific	6
<u>DYNAMICS OF RIFTING</u>			
Volcanic rifted margins	392-396	N. Atlantic	62
Non-volcanic rifted margins	334-Rev., 365-Rev., etc.	N. Atlantic	29
Dynamics of early rifting	323-Rev.	Alboran Basin	9
State of stress in lithosphere	373/E	Site 505. Costa Rica Rift	8
<u>OCEANIC PLATEAUS</u>			
Oceanic plateau	142/E Rev.	Ontong-Java	21

Ocean History Panel Meeting 28 Feb - 2 March 1991

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Ans'd...........

Executive Summary

Proposal ranking

OHP reached the following ranking among proposals for the guidance of PCOM in their producing a tentative 4-year plan:

1 320/A Drilling in the Nordic Seas (the Arctic Ocean-the Norwegian/Greenland/Iceland Sea - the NW Atlantic Ocean System), Addressing High Northern Latitude paleoceanography and paleoclimatology Jansen, E. et al

336/A Arctic to North Atlantic Gateways, Oceanic Circulation and Northern Hemisphere Cooling Thiede, J. et al

305/F Arctic Ocean Drilling Mudie, P. et al

(probably 2 legs as advocated by the DPG)

2 348 Upper Paleocene to Neogene sequence stratigraphy: the ice house world and the US middle Atlantic margin. Miller, K.G. and Christie-Blick, N.

3 354 Late Cenozoic history of the Angola/Namibia upwelling system. Wefer, G. & Berger, W.S.

339 Paleoceanographic record of the Benguela Current and Associated High-Productivity Areas: Drilling Transects on the Southwest African Margin. Diester-Haass, L. et al

4 388 A proposal to Advance Piston Core the Ceara Rise, West Equatorial Atlantic: Neogene History of Deep Water Circulation and Chemistry. Curry, W.B., Backman, J. & Shackleton, N.J.

5 253 Black Shales/Shatsky Rise. Schlanger, S.O. & Sliter, W.V.

6 347 Late Cenozoic Paleoceanography, South-Equatorial Atlantic.
Wefer, G. and Berger, W.H.

7 CEPAC/390 Bering Sea.

8 386E/Rev California Margin: Neogene Palaeoceanography of the California Current, Coastal Upwelling, and Deformation of the Gorda Plate. Lyle, M., Barron, J., et al

9 345/A The West Florida Continental Margin, Gulf of Mexico: Sea Level and Paleoclimatic History. Joyce, J.E. et al

10 365/Rev Conjugate passive margin drilling - North Atlantic Ocean. Austin, J. et al with 363/ADD Paleoceanographic record at proposed drillsites NR1, NR2 & NR3 Tucholke, B.E.

11 296/C Ross Sea, Antarctica. Cooper (tied with the above)

12 313/A Evolution of a major oceanographic pathway: The Equatorial Atlantic. Jones et al

North Pacific Transect
OHP generated a drilling plan for this leg that will fit in a normal length leg providing that the leg starts from Yokahama. OHP urges PCOM and TAMU not to waste five days of science in this distant part of the ocean by returning to Honolulu after the previous leg.

Reviews
OHP reviewed many new proposals and also discussed several that have been "in the system" for a while. The proponents of some of these will be urged to update them.

OHP met 28 February in Chapel Hill, North Carolina, hosted by Tim Bralower. Present were: N Shackleton (chair), Bob Duncan (PCOM), Audrey Meyer (TAMU), Guy Smith (LITHP), Peter Swart (SGPP), Bill Berggren, Tim Bralower, Jim Channell, Peggy Delaney, Tim Herbert, Al Hine, Tom Loutit, Alan Mix, Lisa Pratt, Edith Vincent, Gerold Wefer.

On 29 February the panel was joined by Dave Rea (chairman, Atolls & Guyots DPG), Isabella Premoli Silva (alternate to Eystein Jansen, ESF), Joe Morley and Lloyd Keigwin (Proponents for the North Pacific Transect proposals).

Apologies for absence were received from Peter Davies, Eystein Jansen, John Barron and Hise Okada.

After welcoming remarks from Tim Bralower, welcome to new members and introductions, we proceeded to the PCOM Report (Duncan).

PCOM REPORT

USSR has signed an MOU and will participate from Leg 138.
The FY '92 plan was introduced (see JOIDES JOURNAL).

NJS commented that he was pleased that PCOM now allows Panel Chairmen to present Thematic Panel prioritisation at the PCOM Annual Meeting. He feels that this is a better way of ensuring that when the next Fiscal Year's drilling is planned by PCOM they are fully aware of Thematic Panel interests.

The concept of Add-On short proposals, discussed by OHP at the last meetings, is being tried. Proposals for the FY '92 plan will be accepted up to 1 June. NJS explained that this will require that the panel review these by mail since the decision on these will be taken at the August PCOM meeting before OHP meets again.

Whole-round blind sampling for OGP has been terminated as recommended by OHP.

NSF have committed support for unexpected fuel price rises, forestalling the possible delay to publication schedules that might have arisen due to the funding shortfall.

NSF has decided to renew the program for five years with the Joides Resolution, with the decision regarding other platforms to be critically evaluated after that.

STRATCOM is enthusiastic to see more good review articles on those areas of ODP science that "will be in the textbooks within a decade". Members could look, for example, to Geology Today that is edited by Eldridge Moores for GSA.

DPG's in operation are:
North Atlantic/Arctic Gateways (has met; Berggren and Jansen members from OHP, Berggren to report)
Atolls and Guyots (meeting 27-28 February, Rea to report)
Atlantic Rifted Margins (Berggren member, to report)

In addition there is one Working Group:
Sea Level (to meet 2 March, Davies and Loutit members from OHP)

NJS also reported on the Panel Chair Meeting the day before PCOM. Many of PCOM's decisions came out of this meeting. For example, this group discussed the concept of supplemental or add-on proposals in greater depth than PCOM had time for.

TAMU SCIENCE OPERATORS - REPORT (AUDREY MEYER)

AM explained that a serious effort is being made to ensure that

PCOM design drilling legs for no more than 56 days except in really exceptional circumstances.

Although the schedule for FY '92 is set, the port calls are not firm; the ports currently written in involve excessively long transits.

Staffing pressures will change with the entry of USSR. Up to now the 2-members per leg written into the MOU with non-US countries has been balanced by the informally preferred 50% US participation. To maintain this would require 4 more scientists; more likely is that the 50% US participation will not be maintained, especially as USAAC is experiencing funding difficulties. Duncan reported that the idea that non-US student participants might sail as technicians is apparently not receiving much support at present unless they were not counted in the agreed number of scientists (it had been proposed that this could ease the pressure on the number of scientist slots; there is general agreement that on many legs it would be more useful to have more technicians rather than more scientists.

ODP-TAMU has a position open for a geochemist (hopefully filled soon) and several technical staff changes.

Publications are coming very close to the target with Initial reports out around 10-14 months post cruise and Science Reports close to the 36 month target. There is funding concern resulting from the extreme length of some Initial volumes (Leg 133 may need two volumes!).

Several concerns regarding the publications and editorial handling were aired again; Audrey Meyer accepted that some of the criticisms were valid but assured the OHP that many had been dealt with already.

Leg 135: of interest to OHP is that the computer-input barrel sheets were used on this leg, although they were not actually filled through the computer on that leg. On Leg 138 the Visual Core Descriptions will be entered into the computer.

Leg 134: the Sonic Core Monitor was used successfully. This device was designed to record exactly where in section each piece of core originated. However, it requires rebuilding with sturdier components before it can be regarded as useable. Core Recovery in reefal carbonates was poor (below 15%), a which gives cause for concern for two Atolls/Guyots Legs.

The French downhole Magnetic susceptibility tool was deployed successfully, as was the new German downhole borehole televiewer.

The Vibra-Percussion corer is regarded as not yet having operated effectively despite having recovered some material on leg 133.

PCOM has declared the Formation Microscanner one of the Routing Logging Tools on the basis of its successes.

The Diamond Coring System has a great deal of development ahead before it can be used as a routine tool. Current expectations are that we cannot anticipate using it for OHP purposes in the next couple of years.

SMALL ITEMS OF BUSINESS

It was not possible to identify a permanent Liaison to SGPP; Hine is unable to attend the next meeting and NJS will try to find an ad hoc liaison for the following one.

NJS drew attention to the Moran/Worthington report on the integration of core and downhole data; the panel welcome the document.

The existence of the AGU Paleoceanography Committee Bulletin Board PALEOCEAN on TELEMAIL was drawn to the attention of OHP members.

The USAAC Workshop on Antarctic Paloeceanography will be hosted by Kennett, 28-30 August.

The USAAC Paleogene workshop was attended by OHP members Shackleton, Herbert and Berggren. The report should help us with future planning.

PROPOSAL REVIEWS

A few points were re-iterated or re-emphasised for new members:

1. Reviews are not judgements on proponents. Proposals are the documents from which the drilling program is constructed.

2. Panel Members are chosen for their expertise. During their short tenure they should contribute as much as possible and should be encouraged to submit and promote drilling proposals; the system has ample controls as well as delays, that there is very little danger they that an individual panel member might have undue influence.

3. It is nonetheless important that every review represents the collective opinion of the panel.

4. It may well be necessary for the level of proposals addressing OHP themes that are to be presented to PCOM with high ranking to be improved considerably; the OHP should probably put more effort into assisting the proponents of proposals that the panel

seriously hopes to see drilled.

5. Proposals that have been in the system for over two years without any new support from their proponents are liable to be regarded as "dead". The OHP must keep an eye to prevent proposals that they judge important from falling into this category.

389 Cretaceous N-S Traverse in the Western South Atlantic
Malgrem, B.A.

As presently proposed only a very narrow problem is presented; either a much more substantial Mesozoic plus Cenozoic proposal should be put together (probably involving other proponents) that could justify a major N-S transect, or the proponent should contact proponents of existing proposals so that his interests can be added to their proposals.

Objectives The objectives of this proposal relate entirely to Cretaceous micropaleonotology; 1) To study biotic evolution, radiations, extinctions, speciation processes and phyletic evolution, 2) To investigate the paleobiogeography of planktonic and benthic microfossils with changes in South Atlantic paleoceanography and Late Cretaceous climate.

Drilling requirements 6-7 sites along a N-S traverse from 5°N to 50°S in South Atlantic. No site survey or depth data given.

Review This proposal is still in a very preliminary state. Even so, we feel that it is worthwhile to pass along some remarks/advice to the proponent at this time in order to help him formulate as strong a drilling proposal as possible. This proposal contains very narrow goals. If the proponent is to make it of more interest to OHP, he must broaden the scope of the proposed investigation to include wider paleoceanographic goals such as circulation, thermal gradients, productivity etc. We have several questions which must be addressed in a more detailed proposal: (1) How will biogeographic factors be separated from other variables such as local circulation, preservational changes etc. (2) Will preservation in these sites be sufficient to do detailed biogeographic work? (3) How was the location of sites selected and are site survey data available? (4) Why the Western and not the Eastern South Atlantic? (5) What about the overlying Cenozoic section? Several of the important themes, especially those relating to evolution, should be addressable from presently drilled S.Atlantic sites. The proponent must demonstrate that many of the questions posed cannot be answered from existing material. In addition, the proponent must make an effort to compile data from existing S.Atlantic sites especially from more recent legs 73, 74, 75 and 114 and to show that the drilling is still necessary.

390 Drilling in the Shirshov region Milanovsky, V. & Neprochnov, Y.

A brief proposal with new seismic data for the Shirshov Ridge. The proponents should be encouraged to contact the proponents of the two earlier Bering Sea proposals. OHP does have strong interest in drilling in the Bering Sea and would welcome either a new major proposal or the formation of a DPG for the Bering Sea.

59/Add Continental margin sediment instability investigation by drilling adjacent turbidite sequences Weaver, P.P.E. & Kidd, R.B.

OHP feels that this proposal primarily addresses the sedimentological consequences of sea level change and is thus primarily in the SGPP mandate. However, OHP believes that the proposal will not add to our understanding of sea level history or processes for a number of reasons. The proponents have not illustrated a link between sea level and turbidite deposition - no obvious pattern based on figures shown. There is no question that there is a repetitive pattern, but the pattern is not documented relative to specific changes in sea level. Error bars on turbidite ages are not shown and no O-18 curve was provided for comparison.

Probably should be accompanied by work on understanding the sedimentary processes on the adjacent African margin. How well known is the upwelling history on this margin? No discussion of mechanisms of mass wasting. This would seem to be a critical component of the model and should be addressed.

OHP also raised some questions concerning the effective use of nannofossil biostratigraphy in the time intervals to be studied.

Thr methodology outlined may be more appropriate for long term monitoring of sea level activity rather than details of sea level events.

323-REV The Alboran Basin and the Atlantic - Mediterranean Gateway: Neogene evolution of continental basement overthrusting and extension in the Alboran Sea and development of the Atlantic - Mediterranean Gateway. Comas, M.C. et al

The goal of reconstructing paleoceanographic changes in the Mediterranean gateway is central to OHP's themes. However, the paleoceanographic aspects in this proposal do not seem to effectively address these goals. The panel is sceptical whether the primary paleoceanographic sites in the Gulf of Cadiz will provide a suitable record, as their interpretation is based on the presence of sand coutourites and turbidites, making stratigraphic interpretation difficult. The proposal does not discuss in any detail the potential paleoceanographic studies in the Alboran Sea. The sites are positioned primarily for achieving tectonic objectives; to receive strong support from OHP, site selection would need to fully address recovering complete, continuous pelagic sequences.

The Ocean History Panel does recognize the importance of a good tectonic reconstruction in the Mediterranean region and its role in constraining paleoceanographic reconstructions, but thinks that evaluation of these aspects is better handled by the Tectonics Panel.

391 Depositional history and environmental development during the formation of Sapropels in the Eastern Mediterranean Zahn, R. et al

This proposal outlines a PROCESS STUDY to assess the roles of productivity versus preservation in forming sapropels (but favours productivity). As proposed, the process study does not require long ODP records, and does not explain the need for transects of several cores. This study could be done more effectively on large-volume, short gravity cores available at several institutions in Europe and the U.S. The Ocean History Panel does recognize the importance of sapropel history as a part of the paleoclimatic evolution of the Mediterranean. This proposal, however, does not design a coherent experiment to address these historical aspects, as would be required to gain strong support from the Ocean History Panel.

365-REV Conjugate passive margin drilling - North Atlantic Ocean

Austin, J. et al

Objectives This proposal addresses major paleoceanographic objectives. These include the determination of earliest (Late Triassic-Jurassic) paleoenvironments of the Atlantic, documentation of Cretacous sea level fluctuations and study of circulation changes in the Cretaceous and Cenozoic.

Sites Scores (it would help in reviewing this proposal if we could get some idea of how many legs this program expects to occupy.)

Review Parts of this drilling program will doubtlessly be rewarding from a paleoceanographic point of view. Numerous excellent Upper Cretaceous and Cenozoic sections should be recovered. The site selection has clearly been dominated by tectonic considerations, however, there are numerous sites which are well positioned to achieve paleoceanographic goals.
Transect drilling is an important part of the document drawn up after the Cretaceous Rhythms, Events and Resources meeting last year, and although these transects are not in an ideal position for answering some of the questions related to the origin of organic-rich sediments in the Cretaceous, they should compliment other proposals which are currently being prepared. A major problem with the location of both transects is the likelihood of recovering sections dominated by redeposition, especially in the basinal locations, however, this is a ubiquitous problem in this part of the Atlantic. The Triassic-Jurassic goals are certainly less attractive as these sediments are likely to be highly lithified and poorly recovered.

393 Drilling the continent - ocean transition on the SE Greenland volcanic rifted margin: linking continental flood basalts to seaward dipping reflector sequences Larsen, H.C. et al.

The proposal is primarily of TECP and LITHP interest. In order to maximize the paleoceanographic objectives of this leg the OHP suggests that the proponents contact Bill Ruddiman at LDGO who is the chair of the North Atlantic Gateways DPG. The NAGDPG recently completed a meeting and are in the process of writing a document outlining their plans. OHP also recommends that the proponents obtain copies of proposals 305, 320 and 336 as soon as possible.

395 Post-breakup compressional tectonics on a passive volcanic continental margin Boldreel, L.O. & Andersen, M.S.

Primarily of TECP and LITHP interest. However, 2 sites are of interest to OHP. Two sites in the Faroe Bank Basin offer an opportunity to look at the evolution of deep water exchange between the Arctic Ocean/Norwegian Sea and the North Atlantic. One site HPC and the other double HPC. In order to maximize the paleoceanographic objectives of this leg the OHP suggests that the proponents contact Bill Ruddiman at LDGO who is the chair of the North Atlantic Gateways DPG. The NAGDPG recently completed a meeting and are in the process of writing a document outlining their plans. OHP also recommends that the proponents obtain copies of proposals 305, 320 and 336 as soon as possible.

396 Testing of the hot-spot model for the origin of volcanic passive continental margins Andersen, M.S.

Primarily of TECP and LITHP interest. However, secondary objectives are concerned with: the Cenozoic paleoceanography of the Greenland-Iceland Faroe Ridge and the influence of this ridge on water exchange between the Nordic-Arctic Ocean and the Atlantic Ocean; drift sediments in the area; correlation of paleoceanographic events and marine biostratigraphy to glacial events.

Specific objectives include: 1) the subsidence history of the Greenland-Iceland Faroe Ridge 2) the longevity of a possible Scotland-Faroe-Greenland land bridge 3) the history of water exchange between the Norwegian-Arctic Sea and the Atlantic Ocean; 4) the evolution of cold, oxygen-rich bottom waters.

Sites FIR/A-1,-2; FIR/B-1,-2,-3; subsidence of the ridge
Sites ICB/A-1,-2,-3; evolution of deep water drifts, sediment transport mechanisms, correlate glacio/volcanic events with paleoceanography (intercalated drift and indurated volcaniclastic sediments.)

In order to maximize the paleoceanographic objectives of the leg, the OHP suggests that the proponents contact Bill Ruddiman at LDHO who is the chair of the North Atlantic Gateways DPG.

Proposals 393, 395 and 396 all offer paleoceanographic objectives in the Norwegian-Greenland Sea. On the one hand OHP felt that since a DPG has just met to generate a drilling plan for the region taking account of carefully prepared proposals to tackle the same problems, OHP would be unlikely to give support to proposals that include contributions in this area on the side. On the other hand there was a strong feeling that if any or all of these proposals obtains strong support from other panels then the proponents should have the opportunity to make the case for their paleoceanographic interests within the context of the work proposed by the North Atlantic Gateways DPG, which should probably then be reconvened to maximize opportunities for the area. Meanwhile the proponents of these proposals should contact Bill Ruddiman as chairman of NAGDPG to be well informed.

A single S-category proposal was received for review (OHP had at their previous meeting strongly supported the proposal for the Santa Barbara Basin in anticipation of the possibility that PCOM might create this category).

Proposal S-1 is to document Lithofacies and Depositional Cyclicity, Navy Fan, California Borderland. On a technicality, NJS pointed out that in requesting 6 days drilling this proposal does not fall within the PCOM guidelines. However, on the assumption that it could be resubmitted with fewer holes in order to satisfy the guidelines, it was discussed by OHP. The objectives clearly fall only within the SGPP mandate.

ARCTIC GATEWAYS DPG

Berggren reported on the meeting of the DPG on Arctic Gateways/Norwegian Sea Drilling. A report with drilling recommendations will be produced shortly. The report will recommend two legs of drilling a year apart. Aside from enabling all the objectives to be achieved, this strategy maximizes the chance of obtaining the most important objectives which are so far North that the ice conditions would not permit drilling in some years.

Clearly since the scheduling of the second leg a year after the first would require that the decision on the second leg be taken, the panel will need, at the meeting one year from now, to rank the second leg in isolation without information on the success of the first one. OHP discussed this, and on the basis of Berggren's verbal report on the DPG meeting, were firmly convinced that a two-leg program will be needed to achieve the large range of objectives in a satisfactory manner. It was recalled that latitudinal, longitudinal and depth transects are needed in an area that is quite large, both in detail for high-resolution Neogene investigations and for the very important geologically longer record of the role of the Norwegian-Greenland Sea in relation to the global ocean.

NORTH PACIFIC TRANSECT

The major item of business: the North Pacific Transect, was discussed next. NJS explained that PCOM scheduled this leg on the basis only of OHP support. For this reason OHP, rather than a new DPG, were invited to distil a program that could be accommodated in a not-too-long leg with transit from West to East built in. NJS also explained that he had assured PCOM that the OHP strategy of investigating the history of the response of the ocean to high-frequency climatic variability absolutely requires a North Pacific Transect; that the recovery of sequences containing carbonate microfossils had appeared impossible until recently and that these sequences will be of huge value despite the evident fact that the stratigraphic sequences are not so well displayed as in some other areas of the ocean. He also informed PCOM that the North Pacific is also very important in relation to longer-timescale objectives and here he defended sites NW3A and NW4A on the grounds that since these are not chiefly high-frequency sites there is no significant danger that low-quality survey data will prejudice the scientific returns.

Morley presented the prime justification for site NW1, which will contain an excellent high-resolution paleoceanographic record that will be documented primarily by radiolarians. The potential is well documented by the data from piston-core V20-122 and the data will extend northwards the transect provided by Leg 86 sites. Good magnetostratigraphy is expected on the basis of experience with leg 86 sites. In discussion, OHP recognised the great importance of this site.

Lloyd Keigwin presented the rationale for the Detroit Seamount sites. The chief objective is to obtain Neogene sequences across a depth transect in order to monitor changes in the vertical structure of the ocean (using stable isotope and geochemical tracers in benthonic foraminifera as well as benthonic faunal changes). In discussion, the panel also appreciated the value of this objective. However, rather than spend time drilling deeper into Site DS2 (which was never envisaged by the proponent as a deep site) they would prefer only to APC core this intermediate water depth site, but to insert two sites in the mid part of the transect so as to improve the scientific return from the transect. Keigwin will provide survey data to support sites DS2 and DS2A. The position of the basement at site DS1 was queried by Loutit; if the basement is to be cored to satisfy non-OHP objectives then the site must be chosen so that it can be achieved without coring sediments that appear jumbled.

Alan Mix presented the rationale for the Patton-Murray seamount site since none of the proponents was able to attend. Again the chief importance of this site lies in the fact that carbonate microfossils are present in a stratigraphic sequence that appears to contain considerable promise. The basement is a significant scientific objective at this site and OHP believe, like CEPAC, that in such a distant part of the ocean time should be found for important objectives outside the thematic objectives of the leg where feasible.

Dave Rea presented the rationale for sites NW1, 3 and 4 in terms of understanding the history of wind transport (trajectories and intensity) as well as the contribution that NW3 and NW4 will have to understanding plate dynamics and the contributions that the deeper part of the sections at virtually all the sites will make to understanding the Mesozoic history of the region.

Dave Rea presented drilling time estimates and also transit time estimates (later confirmed by TAMU) on the basis of a leg starting from Yokahama and ending in Seattle. The consensus was that in spite of the possible extra cost of using a Japanese port, the saving of five days' science was especially important for this distant part of the ocean and the panel were unanimous that planning should assume that the Yokahama option will be taken.

Even with this port call, the drilling times estimated to attain all the objectives in the CEPAC prospectus for this leg add up to about 49 days which with transit would require a 69 day leg.

CEPAC estimates:

site	drill	log	total
NW-1A	3.8	1.6	5.4
NW-3A	3.8	1.6	5.4
NW-4A	3.8	1.5	5.3
DS-1	5.3	1.6	6.9
DS-2	5.9	1.7	7.6
DS-3	10.3	2.1	12.3
PM-1	5.2	1.5	6.7
Total			49.6

OHP discussed various options and made a well balanced assessment of the multiple objectives in the program. It was proposed that site NW3A could be sacrificed. Rea explained that, although the site is desirable for both wind and tectonic objectives, its material would represent an incremental increase in information for the Aeolian history while the alternative plate history scenarios are making sufficiently different predictions of the age of the crust at NW4A that drilling this site without NW3A should solve the problem.

OHP also advocate dropping the deeper objectives of site DS2 which have not been proposed by Keigwin and could not be justified by the seismic data. However, the OHP encouraged Keigwin to seek a second site for APC drilling at a depth intermediate between that of DS1 and DS2. Thus the original proposal for the region to drill a depth transect to learn the Neogene history of intermediate- and deep- water stratification in the North Pacific, will be strengthened to a four-site program. Site DS1 on the top of Detroit Seamount may yield a valuable Paleogene record and sample the seamount core, although at the site proposed, the sediment appears from the seismic line to be nearer 1000m than 500m in thickness; further thought is needed to optimise this site.

After examining the seismic data for DS3, OHP were optimistic that this site will yield a valuable high-latitude Mesozoic record above basement. The program then becomes:

Transit Yokahama to NW1A

site	drill	log	total
NW1A	3.8	1.6	5.4
DS-1	5.3	1.6	6.9
DS-2	1.5		1.5
DS-2A	1.5		1.5
DS-3	10.3	2.1	12.4
NW-4A	3.8	1.5	5.3
PM-1	5.2	1.5	6.7

Transit PM to Seattle

Add 19 days transit

Transit estimates given to Audrey Meyer by TAMU 2.3.91:

Yokahama to Detroit Seamount sites	5.8 days (Honolulu, 10 days)
DS to NW-1 A	1.4 days
NW-1A to NW-4A	3.5 days

NW-4A to PM-1	5.1 days
PM-1 to Seattle	4.5 days
Total transit	20.3 days

But a better option is to re-order, starting with NW-1A in which case the time reduces to about 19 days as used above (or somewhat over 23 days if the transit were from Honolulu).

These drilling times assume that the objectives of sites NW1A and NW4A can be achieved by the combination of 2*APC and XCB. They also assume no significant setting up time for DS-2 and DS-2A, and that these APC-only holes will not be logged.

Guy Smith (LithP) informed the panel that the most important basement sampling would be at DS1 and PM1. However, the drilling times are based on terminating Site DS-1 at around 500m which possibly would be far short of basement.

OHP also discussed the option of returning to DSDP 192 now that USSR have signed an MOU to join ODP. This site might well have some advantages over DS2 as a component of the depth transect, but the remainder of the section at DSDP 192 does not appear from the Initial Reports to be of special value and the extra transit time to DSDP 192 would not be warranted solely to take an APC core there instead of at DS2.

ATOLLS AND GUYOTS LEGS

Dave Rea outlined the outcome of the meeting of the Atolls and Guyots DPG. He reported that the meeting had gone very smoothly despite the rather large attendance. Two legs of exciting drilling have been planned on the basis of the excellent proposals; the draft minutes of the meeting are already available and will not be repeated here.

The new Japanese downhole 3-component magnetometer may be available for this leg (for basalt); this is designed to be compatible with the Schlumberger tool string (Audrey Meyer cautioned that it will need to have been tested successfully if it is to be used).

Peter Swart commented that although pore waters cannot properly be taken without a packer (which Rea had remarked implies that pore waters will not be available) the use of a Barnes type tool after logging can, if a tracer such as tritium is used to determine the seawater end-member, provide very valuable information on the porewater and should be used.

PROPOSAL RANKING

Proposal ranking was undertaken in four steps. (1) before the meeting NJS circulated with the minutes a list of proposals (including a few that were submitted some while ago) with names of panel members to whom copies would be sent, and invited panel members to suggest any others that ought to be reconsidered. (2) at the meeting each of these proposals was discussed. This gave the panel (including members who had not been party to earlier reviewing) the opportunity to decide whether there are any proponents who should be encouraged to do more work and submit new proposals. In effect this means that a few proponents will receive new reviews from this panel. (3) all the proposals that (a) were of thematic interest to the panel and (b) are of sufficient maturity to rank, were assigned to one of five themes. As regards (b) the degree of maturity deemed "sufficient" was judged subjectively in that taking account of the geographical area as well as the degree to which the support of the panel may accelerate the maturing of the proposal. The themes used were:

"low frequency global change/Mesozoic and Paleogene"; "high frequency global change/Neogene; "upwelling/productivity history"; "sea level history"; "high latitude problems". The last category is not a "geographical theme" but a recognition of the fact that the best proposals for inaccessible high latitude regions have multiple objectives. (4) the proposals within each "theme" were ranked (within most themes the ranking was agreed without any difficulty on the basis of the remarks made during the previous discussion). (5) the panel took a series of votes in each of which the voting was between the highest-ranked proposal remaining in each theme. In the event of a tie between the first two in a voting round, the vote was re-taken between only the two proposals tied. All panel members voted, but if at any stage the number of votes separating the first and next proposal on the slate was small enough so that the result could have been affected by the vote of a proponent, the vote was re-taken with proponents abstaining. Although this procedure was a little cumbersome, the panel judged that it was very fair and that the ranking of twelve proposals given below does reflect the judgement of the panel.

1 320/A Drilling in the Nordic Seas (the Arctic Ocean-the Norwegian/Greenland/Iceland Sea - the NW Atlantic Ocean System), Addressing High Northern Latitude paleoceanography and paleoclimatology Jansen, E. et al
336/A Arctic to North Atlantic Gateways, Oceanic Circulation and Northern Hemisphere Cooling Thiede, J. et al
305/F Arctic Ocean Drilling Mudie, P. et al

(probably 2 legs as advocated by the DPG)

2 348 Upper Paleocene to Neogene sequence stratigraphy: the ice house world and the US middle Atlantic margin Miller, K.G.

and Christie-Blick, N.

3 354 Late Cenozoic history of the Angola/Namibia upwelling system Wefer, G. & Berger, W.S.

339 Paleoceanographic record of the Benguela Current and Associated High-Productivity Areas: Drilling Transects on the Southwest African Margin Diester-Haass, L. et al

4 388 A proposal to Advance Piston Core the Ceara Rise, West Equatorial Atlantic: Neogene History of Deep Water Circulation and Chemistry Curry, W.B., Backman, J. & Shackleton, N.J.

5 253 Black Shales/Shatsky Rise Schlanger, S.O. & Sliter, W.V.

6 347 Late Cenozoic Paleoceanography, South-Equatorial Atlantic Wefer, G. and Berger, W.H.

7 CEPAC/390 Bering Sea

8 386E/Rev California Margin: Neogene Palaeoceanography of the California Current, Coastal Upwelling, and Deformation of the Gorda Plate Lyle, M., Barron, J., et al

9 345/A The West Florida Continental Margin, Gulf of Mexico: Sea Level and Paleoclimatic History Joyce, J.E. et al

10 365/Rev Conjugate passive margin drilling - North Atlantic Ocean Austin, J. et al 363/ADD Paleoceanographic record at proposed drillsites NR1, NR2 & NR3 Tucholke, B.E.

11 296/C Ross Sea, Antarctica Cooper (tied with the above)

12 313/A Evolution of a major oceanographic pathway: The

Equatorial Atlantic Jones et al

Proposals 323, 337, 338 and 391 were also regarded as of sufficient long-term interest to be included in the ranking process although the panel chose to cut off the actual ranking above that level.

The ranking reflects the awareness of OHP that a new proposal for the Upwelling studies off Namibia is being written as a result of OHP's request after reviewing proposals 354 and 339. It also reflects the awareness of OHP that a new proposal is being written for Shatsky Rise in view of the conceptual advances that have been made since proposal 253 was submitted. As regards this proposal OHP re-emphasise that this objective, high in the panel's ranking for many years, cannot be achieved unless advances are made in the engineering problems inherent in drilling and recovering chert-chalk sequences. In view of the continuing interest in the Bering Sea, ranked well above an important Antarctic proposal, and in view of the fact that the Bering Sea Program is a construction of the now-defunct CEPAC so that the original proponents may no longer be the individuals to drive this program forward (especially with the entry of USSR interest) it may be that to set up a DPG would be the appropriate means for obtaining a first-rate proposal.

In the discussion leading up to this exercise, constructive remarks were made on several other proposals that the OHP hopes to give strong support to in the future. These include: 324 (Malta Escarpment).

Co-chief suggestions

OHP discussed possible co-chief scientists with OHP interest for legs 143, 144 and 145.

For 143 and 144, Jerry Winterer, Isabella Premoli-Silva, Wolfgang Schlager, Bill Sliter and Hugh Jenkyns would constitute a good slate for PCOM's consideration
For 145 Dave Rea, Brian Bornhold, Tom Pedersen and John Barron were suggested.

Under other business, NJS expressed concern regarding the phenomenon whereby the length of sediment shown to have been recovered after compiling a double APC site is about 7-10% greater than the thickness of section cored. Audrey Meyer undertook to send an engineer's memo on this question; the OHP agreed that the phenomenon should be investigated and, ideally, eliminated.

Next meeting: 1-3 October, Yamagata, host Hisatake Okada.

NJS thanked Tim Bralower for hosting the meeting in a very enjoyable locality, and Peggy Delaney for assistance in keeping notes on the meeting.

The meeting closed at 2.00 on March 2nd.

Posted: Wed, Apr 3, 1991 6:31 AM EST Msg: AGJB-4658-5377
From: N.SHACKLETON
To: joides.utig
Subj: ohp minutes

One think that is not crystal clear in the executive summary of the minutes is that the third priority as listed there is a combination of proposal 354 and proposal 339; we anticipate a revised proposal coming in that will include proponents of both these.
cheers, Nick

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Ans'd...........

Minutes
Sedimentary and Geochemical Processes Panel
College Station, Texas
March 5, 6 and 7, 1991

Executive summary

The main topics of discussion during the 3-day meeting were *"Gas hydrates and ocean drilling"* and the ranking of proposals from all oceans for drilling beyond Leg 147. The first topic was the subject of a workshop, the proceeding of which will be reported separately but its recommendations are listed below. The ranking of drilling proposals was preceded by grouping them according to the five themes of SGPP as published in the panel's White Paper. The final ranking was by voting each time for one of the top-ranked proposals in each of the five thematic groupings.

A. SGPP final ranking

1	(335)	Gas hydrate
2	391	Mediterranean sapropels
3	DPG	Sedimented ridges II
4	348/A	New Jersey margin sealevel
5	380/A	VICAP
6	233/E	Cascadia margin II
7	354/A	Benguela Current
8	59/A	Sediment instabilities
9	DPG	East Pacific Rise II
10	337	New Zealand sealevel
11	360/D	Valu Fa sulfides
12	388	Ceara Rise
13	368	Return to 801
14	361	TAG hydrothermalism
15	340/B	NW Australian margin
16	330/A	Mediterranean Ridge
17	378/A	Barbados accretion
18	367/C	South Australian margin
19	275/E	Gulf of California
20	372	North Atlantic water mass evolution

B. Gas hydrate recommendations

1. Dedicated gas hydrate leg

The interaction of natural gas hydrates with the thermal and fluid regime of continental margins and in particular accretionary complexes, is the highest scientific priority of the SGPP. Likewise, the presence of gas hydrates has uniquely influenced safety deliberations by the PPSP in drilling deep margin holes. Hence, the participants of a gas hydrate workshop held in conjunction with the SGPP meeting recommend that a dedicated gas hydrate leg be planned and drilled similar to the one previously proposed for the Peru margin (355 A). The SGPP and the PPSP, outside proponents and investigators should design such a leg with drilling opportunities in the Atlantic or the Pacific Oceans. This planning process should take into account the relevant gas hydrate results expected from Legs 141(CTJ) and 146 (Cascadia).

2. PCS: Exchangeable pressure chamber

The pressure core sampler under development by ODP is a coring system capable of retrieving samples at bottom hole pressure, and hence is the key tool for pursuing several major objectives of SGPP, notably the behavior of fluids, gases and hydrates in accretionary prisms. The SGPP considers that successful completion of these objectives requires three exchangeable pressure core subassemblies and recommends that these be available for the upcoming legs 141 and 146. These assemblies should be used on a rotating basis with one chamber attached to the PCS system during sampling, while the contents of the second one are subsampled and analyzed aboard ship and the third one is being readied for a new deployment. This approach allows a complete downhole profile, as opposed to a single measurement per hole. It provides adequate turn-around time for close sample spacing downhole, eliminates the costly construction of an as-yet-unavailable transfer chamber, and ensures back-up in case of damage. If trace metal concentrations are of high priority, the multiple subassemblies are to be made of titanium; if gases, dissolved metabolites or major sea water ions are to be measured, the less costly stainless steel version is adequate.

3. PCS: "Harpoon" for extracting pore waters

For shipboard analyses of the pressurized samples obtained by the PCS system, the "harpoon" is presently the most suitable attachment for subsampling fluids. It utilizes the internal pressure of the sample chamber to self-squeeze pore waters from the center of the core thereby eliminating possible contamination by drilling fluid. This attachment has been constructed to be used in conjunction with the pressure chamber subassembly but has not been tested. SGPP concurs with the recommendations of the workshop participants that construction, testing and operation of the harpoon be completed with input from the shipboard geochemists of Legs 141 and 146.

4. PCS: Manifold for extracting free and hydrated gases

A gas sampling manifold is required to obtain the contents and composition of free and hydrate gases. The existing manifold assembly of the PCS tool appears to be inadequate -due to large internal volumes- to conduct the necessary experiments with gas hydrate contained inside the pressure chamber. The SGPP concurs with the recommendation of the workshop participants that a previous successful gas sampling manifold (Keith Kvenvolden; USGS Menlo Park) and a new but untested design (Jean Whelan; Woods Hole Oceanographic Institution) be perfected by ODP with input from both of these experts as well as future shipboard geochemists.

5. Predictive equation for depth of gas hydrate stability

The temperature and pressure regime below the seafloor determines the stability field of pure methane and mixed gas hydrates. The SGPP concurs with the recommendation by the workshop participants that an analytical equation be tested and substituted for the graphic method -used unchanged since the days of DSDP- and that a software package, allowing numerical solutions for any environment of gas hydrate stabilities, be developed for use aboard the JOIDES Resolution to improve safety measures.

C. Other recommendations

1. Wireline/packer water sampler
The SGPP considers the wireline-packer water sampling device an important development which is necessary for obtaining fluids from hard rock sites. The recent failure on Leg 133 should not be allowed to hinder the future development of this needed instrument. Notwithstanding the development of an ODP/TAMU water sampler, the SGPP understands that there are some commercial water/wireline packers available from Schlumberger. Their possible deployment and use drilling could be pursued as an alternative in legs such as the upcoming atolls and guyots (legs 143 and 144), but the wireline packer should be the only method for obtaining fluid samples in the future. The SGPP feels that the absence of this technology combined with the lack of suitable sediment samples from which to squeeze pore fluids will seriously impact the scientific results obtained from these legs. Pore fluids from the atolls and guyots drilling are needed to address questions of diagenesis and fluid circulation within these carbonate edifices, as mandated by the SGPP.

2. Sand sampling
As outlined in the SGPP White Paper, there is a strong need to be able to collect undisturbed cores of unconsolidated sands and other coarse-grained lithologies. In the immediate future, high-priority SGPP objectives on Sedimented Ridges I (Leg 139), Cascadia margin (Leg 146), and, if approved, Navy fan will require this capability. Two potential solutions have been pursued by ODP engineers for recovering the required sediments: a vibrating core and a break-away piston head within the APC coring system. Development of these tools however, has apparently stopped. We strongly urge PCOM to ensure that development of appropriate tools be given a high priority immediately, so that they will be ready when needed.

3. S-1 Navy fan
The first supplemental science proposal following the new PCOM policy is a request to drill the prograding fan off the California borderland to determine the time variability of turbidite deposits in relation to late glacial sealevel. This request addresses high priority objectives of the SGPP and the panel recommends the maximum of 4 days (PCOM policy) for drilling the Navy fan. S-1 should be carried out with an enhanced engineering staff on board that can ensure the successful operation of a sand sampling tool. Under these requirements drilling should take place at the beginning of Leg 147 (East Pacific Rise or Hess Deep) and not impact leg 146 (Cascadia margin).

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MINUTES

The meeting started at 12:30 p.m. following a workshop on "Gas Hydrates and Ocean Drilling" on March 5 and 6. The minutes and the detailed recommendations of the workshop will be reported separately. Minutes taken and prepared by R.D. Flood and E. Suess.

Attendees

J.C. Alt
J. Boulegue
N. Christie-Blick
H. Elderfield
P. Farrimond (alternate for D. Stow)
R.D. Flood
M.B. Goldhaber (last meeting)
W.W. Hay
R.N. Hiscott
J.A. McKenzie

F. Prahl
F.L. Sayles (new member)
E. Suess (chairman)
P.K. Swart (new member)

R. Moberly (PCOM liason)
R. Zierenberg (LITHP liason)
M. Von Breymann (ODP liason)
M. Lyle (Borehole)
C. Fulthorpe (JOIDES Office)

Apologies

S. Dreiss
M. Ito

J. Mienert

Agenda

Reports:
- PCOM - Planning Committee Meeting
- NARM - North Atlantic Rifted Margins-DPG
- NAAG - North Atlantic Arctic Gateways-DPG
- A & G - Atolls and Guyots-DPG
- S. L. - Sea level-WG
- OHP - Ocean History panel
- DMP - Downhole measurement panel
- ODP-TAMU - Science Operator

Reviews
- Cumulative list
- Quick reference guide

Ranking
- All active proposals
- NAAG Group 1
- NARM Groups 1 & 2

Deep drilling
- Somali Basin
- Subduction zone drilling from island

Miscellaneous

Reports

PCOM: R. Moberly referred to the Executive Summary of the PCOM minutes previously distributed to all SGPP members and the published ship schedule. These additional items were specifically discussed: (1) There needs to be a recommendation from this panel about phase II of the Pressure Core Sampler (PCS). (2) There is a policy that proponents must be out of the room whenever there are discussions or rankings of proposals with which they are involved. (3)

A summary of the review process and how it leads to the FY93 plan and the 4-y 000309
plan.

NARM-DPG: R. Hiscott reported on the group meeting, whereby "North Atlantic" refers to north of the Grand Banks - Gibraltar line. The objectives are mostly tectonic. There are some secondary SGPP objectives, but they are not very well developed. A summary of the NARM-DPG by R. Hiscott was distributed and is appended to these minutes. The Newfoundland Basin - Iberia transect appeared to be most likely. The group only looked at ranked proposals, but there are more in the system now.

NAAG-DPG: M. Lyle reported on the group meeting in place of D. Stow who was unable to attend. Highest priority: Neogene origin of ice caps in conjunction with climate information. The group suggested two potential legs from proposed sites (336/A; 320/A). One leg follows the northern sites, the other leg southern sites in Norwegian Sea and NE Atlantic. Potential SGPP interests in provenance of drift sediments to learn location of sources and of deep waters and to determine how the system is evolving.

A&G-DPG: R. Flood reported on the group meeting; the DPG constructed 2 legs from sites of proposals 202 and 203. There were many discussions about the best place to core the carbonate sequences to maximize recovery with the general conclusion that immediately behind the reef might be best. Of prime interest to SGPP are the sea level changes at several intervals in the Cretaceous and Eocene. SGPP also has strong interests in pore water sampling which do not appear to be met because of technical difficulties with the wireline packer water sampler. SGPP wants to make a strong statement in support of the development of the tools required for pore water sampling.

> **Recommendation**
> *Wireline/packer water sampler*
> The SGPP considers the wireline-packer water sampling device an important development which is necessary for obtaining fluids from hard rock sites. The recent failure on Leg 133 should not be allowed to hinder the future development of this needed instrument. Notwithstanding the development of an ODP/TAMU water sampler, the SGPP understands that there are some commercial water/wireline packers available from Schlumberger. Their possible deployment and use drilling could be pursued as an alternative in legs such as the upcoming atolls and guyots (legs 143 and 144), but the wireline packer should be the only method for obtaining fluid samples in the future. The SGPP feels that the absence of this technology combined with the lack of suitable sediment samples from which to squeeze pore fluids will seriously impact the scientific results obtained from these legs. Pore fluids from the atolls and guyots drilling are needed to address questions of diagenesis and fluid circulation within these carbonate edifices, as mandated by the SGPP.

SEA LEVEL: N. Christie-Blick reported on the working group meeting last weekend. The members spent the first portion of the meeting getting up to speed. They want to develop criteria by which to judge ODP proposals designed to study sea level variations. Technical issues that need to be addressed include (1) the need to recover carbonates and unconsolidated sediments, and (2) the fact that some transects include shallow water sites (<200 m water depth) that may require the use of an accessory platform. Several sea level sites (i.e., Legs 143 & 144 Atolls and Guyots) and proposals are currently in the system, but there is a need for more proposals being submitted so that key sites can be selected for the time intervals of interest. A general strategy is in place, now we need to focus in on specific proposals.

OHP: P. Swart, the new liaison from SGPP, reported on the OHP meeting last week, where 1/2 day was spent discussing alternatives to the North Pacific transect. While many alternatives were discussed, there were no conclusions. The final ranking of all proposals for FY 93 by OHP is listed below. The next OHP meeting is scheduled for Oct. 1 - 3 in Japan.

1. 320/336 North Atlantic Arctic Gateways (two legs, alternate years)
2. 348 New Jersey Margin sea level
3. 354/339 Benguela Current
4. 388 Ceara Rise
5. 253 Shatsky Rise
6. 347 South Equatorial Atlantic
7. 229 Bering Sea
8. 386 California Current
9. 345 West Florida Sea Level
10. 363 Late rift/early drift
11. 296 Ross Sea
12. 313 Equatorial Atlantic

Unranked:
South Australia
Alboran Sea
Mediterranean sapropel

ODP-TAMU: M. von Breymann distributed summaries of upcoming legs (appended to these minutes) and discussed results of legs 134 and 135.

Liasons from SGPP

Following the rotation of two U. S. panel members the panel liaisons were discussed:

To OHP:	Peter Swart, with the exception of OHP Japan meeting this fall. M. Ito may be able to act as liason from SGPP to OHP for that meeting.
To LITHP:	J. Alt will be new liason as M. Goldhaber, present liason, is rotating off SGPP.
To TECTP:	S. Dreiss remains SGPP liason.
To DMP:	J. Mienert remains SGPP liason.
To SL-WG:	N. Christie-Blick and R. Flood remain members.

Agenda for joint meeting SGPP/DMP

The SGPP meeting at Lamont on June 4-6 will include a one-day joint session with DMP on June 4. Items on the agenda will include the following questions for discussion:

1 What is the accuracy of geochemical logging tools including uses of new logging tools (e.g., C-O-tool) ?
2 What are the logging characteristics and log interpretation of gas hydrates ?
3 How to make maximum use of sealed bore holes and collect samples at in-situ temperature and pressure ?

4 What are the problems anticipated with the deployment of downhole tools in Cascadia and Barbados drilling ?

5 How to put together a special logging program for SGPP needs? The last question will include discussion of wireline packers and hole stability and their effect on logging. We discussed the possibility of packers or other sampling tools being available in industry, and also suggested of inviting experts from Los Alamos and Schlumberger with interests in geochemical logging.

Review of proposals

E. Suess had distributed prior to the meeting a summary by category of proposals that served as a basis for the discussion prior to our ranking. This summary was supplemented by those proposals previously ranked high with regard to SGPP's interest. The categories represent the themes and respective chapters of the SGPP White Paper. The following proposals received extended reviews during the meeting:

		Rating assigned	
1. SEA LEVEL			
*	367/C	4	South Australia margin
*	345/A	4	West Florida
*	381/A	-	Argentinian slope
2. MATERIAL CYCLING / SEDIMENTARY ARCHITECTURE			
all	380/A	5	VICAP
*@	250/E & S-1	5	Navy Fan
@	59/A	4	Sedimentary instability
	341/A	4	St. Lawrence ice sheet
@	323-Rev	3	Atlantic-Mediterranean gateway
*	313/A	4	Equatorial Atlantic pathways
3. FLUIDS			
	332/A	4	Florida Escarpment
*	355/A	5	Peru gas hydrate
all	378/A	4	Barbados Ridge
all*	330/A & Add	4	Mediterranean Ridge
4. HYDROTHERMALISM / METALLOGENESIS			
*	275/E	5	Gulf of California
	360/D	5	Valu Fa sulfides
	361	5	TAG-hydrothermalism
	325/E	5	Endeavour Ridge
	284/E	5	Sedimented Ridges II
5. PALEOCEAN-CHEMISTRY/-HISTORY			
Atlantic			
all	372/A	4	North Atlantic evolution
●	389	2	Cretaceous Atlantic
●	391	4	Mediterranean sapropels
	354/A	4	Benguela
Pacific			
*	386-Rev	3	Neogene California current

Proposals with secondary SGPP objectives
Atlantic

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all	376/A	3	2/3 Boundary	(hydrothermalism)
all	369/A	3	MARK area	(serpentinization)
*	384/A	2	Aruba gap	(Mesozoic seaways)
*	382/A	1	Vema FZ	(no SGPP objective)
*	374/A	1	Oceanographer FZ	(no SGPP objective)
●	334-Rev	1	S-reflector Galicia margin	(margin evolution)
*	363/A	1	Late rift/early drift	(margin evolution)
●	365-Rev	3	Atlantic conjugate margins	(margin evolution)
●	392	1	Labrador Sea	(margin evolution)
●	393	1	SE Greenland margin	(margin evolution)
●	394	1	Hatton Rockall margin	(margin evolution)
●	395	1	Faeroe Bank margin	(margin evolution)
●	396	3	Faeroe Platform margin	(margin evolution)
Mediterranean				
*	383/A	1	Aegean Sea	(no SGPP objective)
*	379/A	(4)	New Mediterranean prospects	(ridge accretion)
*	364/A	1	Sardinian-African collision	(metamorphism)
Pacific				
@	390	-	Bering Sea	(immature proposal)
	368/A	4	Jurassic Pacific crust	(hydrogeology)
*	373/E	4	Site 505 stress	(ridge flank hydrother.)

all = proposal copy sent to all SGPP members November 1990
* = proposal copy and watch dog assigned October 1990
@ = new/revised proposal distributed to assigned SGPP members for College Station Meeting

Category 1: **Sea Level**

South Australia margin - 367:
Contains a relatively thin upper sediment layer with on-shore sediments of similar age. There may also be Cretaceous sediments within reach of the drill. May contribute to sea level story, as well as be good mid-latitude carbonate margin; immature proposal, cool water carbonate and sealevel objectives are of interest to SGPP; the existing seismic data is not good enough for sealevel objectives.
Rate as 4.

West Florida margin - 345:
Proponents have received a detailed letter from the SGPP chairman on previous discussions; our main concern remains with the apparently limited number of cycles developed and, in part, the erosion of important parts of the cycles by the loop current. SGPP received and acknowledged a letter from the proponents which generally answered our previous concerns; i. e. role of loop current, paleodepth and general timing; SGPP is of the opinion that this proposal is not driven by the phosphorite story and hence the geochemical objectives are of secondary nature.
Rate as 4.

Argentine slope - 361:
Present version of proposal is too immature to circulate, but it may have something to contribute to the sea level story. An up-dated version needs to be looked at.
No rating.

Category 2: **Material Cycling / Sedimentary Architecture**

VICAP-380:

This proposal will help to answer, among many others, the SGPP concerns of how does sediment come to be around a volcanic island. On its primary level, however, it deals with the physical and chemical evolution of the system "asthenosphere-lithosphere-seamount-volcanic island-sedimentary basin" within the well defined Gran Canaria. This is an enormous and over-ambitious objective. Integrated land studies exist, although in several instances drilling on land would be better than drilling at sea. SGPP feels that the "clastic sedimentology" is not optimally developed as well as the pore water chemistry; the panel wishes to see a convincing argument in favor of ocean drilling.
Rate as 4 (potential 5).

Navy Fan-S1:
This is the first "supplemental science" proposal submitted. Since submittal pre-dates PCOMs new policy on the request is for 6 days rather than the maximum 4 allowed. The S1-request is for 3 holes in the Navy Fan to sample environments related to prograding and to determine time variability of turbidite deposits in relation to late glacial sea level. A more extensive proposal will apparently be submitted at a later date. SGPP's previous comments on proposal 250 noted (1) lack of seismic data, (2) no discussion of age control, and (3) difficulties with sampling unconsolidated sands. The present proposal shows that seismic data is adequate and discusses sediment dating with C-14 (last 40 ky) and oxygen isotopes/forams (last 130 ky and earlier). R. Flood also noted success with single-foram O-18 stratigraphy on Amazon fan when sedimentation rates are about 100 cm/ky. Dating will be a challenge because fans are by definition reworked deposits. However, available dating techniques, when used with care and caution, will probably be adequate. ODP has been developing two tools that may be capable of recovering sandy sediments, although thick sand is expected in only one of the proposed sites. These sites may provide a good place to test these new tools.
Rate as 5.

> **Recommendation**
>
> *S-1 Navy fan*
>
> The first supplemental science proposal following the new PCOM policy is a request to drill the prograding fan off the California borderland to determine the time variability of turbidite deposits in relation to late glacial sealevel. This request addresses high priority objectives of the SGPP and the panel recommends the maximum of 4 days (PCOM policy) for drilling the Navy fan. S-1 should be carried out with an enhanced engineering staff on board that can ensure the successful operation of a sand sampling tool. Under these requirements drilling should take place at the beginning of Leg 147 (East Pacific Rise or Hess Deep) and not impact leg 146 (Cascadia margin).

Following this discussion, SGPP was briefed by the ODP engineering staff on the status of sand recovery tools (vibro/percussive corer and break-away piston). The vibro/percussive tool was used on Leg 133, but it didn't appear to vibrate. The tool was disassembled and found to be rusted internally. The tool has been sent back to the manufacturer for quotes on repair, but there is no plan to work the tool back into the system. This tool, and the break-away piston, were developed under the auspices of a visiting engineer who has since left. No one is presently working on the tool. There has been some interest by the BGS and industry to use the corer for some of their projects but no details have been discussed. Based on this report, SGPP sees the need to make a strong statement in support of continued development of these tools.

Recommendation

Sand Sampling

As outlined in the SGPP White Paper, there is a strong need to be able to collect undisturbed cores of unconsolidated sands. In the immediate future, high-priority SGPP programs on Sedimented Ridges I (Leg 139), Cascadia (Leg 146), and, if approved, S1-Navy fan will require this capability. Two potential solutions have been pursued by ODP engineers for recovering the required sediments: a vibro/percussive corer and a break-away piston head. However, development of these tools has apparently stopped. We strongly urge PCOM to insure that development of appropriate samplers be given a high priority immediately so that they will be ready when needed.

Sedimentary instability Madeira abyssal plain-59:
SGPP discussed the addendum received that addresses earlier criticisms and suggests possibility of abyssal plain sites in other ocean basins. SGPP expressed interest in diagenetic packages associated with individual turbidites and in the potential of using these packages as an indicator of paleo-ocean chemistry. Sampling of turbidites in different portions of the basin would allow for determining the origins of individual layers and thus to determine a budget for the mass wasting deposits. SGPP found attractive the global applicability of the budgetary approach to sedimentary mass wasting and would like to ask the proponents to spell out what is really new; i.e. early vs. late diagenesis or can geochemical logging be useful? The panel was not quite clear if this proposal could also be done as a supplemental science proposal to one of the upcoming Atlantic legs.
Rate as 4.

Categories 3 and 4: **Fluids / Hydrothermalism / Metallogenesis**

Florida Escarpment-332:
SGPP has had no response following the lengthy letter written by the chairman after the Paris meeting.
Remains rated 4.

Peru gas hydrate-355:
Although gas hydrate objectives will be addressed in Cascadia margins (Leg 146) and perhaps in the Chile Triple Junction (Leg 141) drilling, SGPP still sees an overwhelming need to better understand all aspects of gas hydrates. These are summarized in the workshop report. A short version of the workshop recommendations on a dedicated gas hydrate leg and related developments of the PCS-tools follow below.
Rate as 5.

Recommendations

Dedicated gas hydrate leg

The interaction of natural gas hydrates with the thermal and fluid regime of continental margins and in particular accretionary complexes, is the highest scientific priority of the SGPP. Likewise, the presence of gas hydrates has uniquely influenced safety deliberations by the PPSP in drilling deep margin holes. Hence, the participants of a gas hydrate workshop held in conjunction with the SGPP meeting recommend that a dedicated gas hydrate leg be planned and drilled similar to the one previously proposed for the Peru margin (355 A). The SGPP and the PPSP, outside proponents and investigators should design such a leg with drilling opportunities in the Atlantic or the Pacific Oceans. This planning process should take into account the relevant gas hydrate results expected from Legs 141(CTJ) and 146 (Cascadia).

PCS: Exchangeable pressure chamber
The pressure core sampler under development by ODP is a coring system capable of retrieving samples at bottom hole pressure, and hence is the key tool for pursuing several major objectives of SGPP, notably the behavior of fluids, gases and hydrates in accretionary prisms. The SGPP considers that successful completion of these objectives requires three exchangeable pressure core subassemblies and recommends that these be available for the upcoming legs 141 and 146. These assemblies should be used on a rotating basis with one chamber attached to the PCS system during sampling, while the contents of the second one are subsampled and analyzed aboard ship and the third one is being readied for a new deployment. This approach allows a complete downhole profile, as opposed to a single measurement per hole. It provides adequate turn-around time for reasonably close sample spacing downhole, eliminates the costly construction of an as-yet-unavailable transfer chamber, and ensures back-up in case of damage. If trace metal concentrations are of high priority, the multiple subassemblies are to be made of titanium; if gasses, dissolved metabolites or major sea water ions are to be measured, the less costly stainless steel version is adequate.

PCS: "Harpoon" for extracting pore waters
For shipboard analyses of the pressurized samples obtained by the PCS system, the "harpoon" is presently the most suitable attachment for subsampling fluids. It utilizes the internal pressure of the sample chamber to self-squeeze pore waters from the center of the core thereby eliminating possible contamination by drilling fluid. SGPP concurs with the recommendations of the workshop participants that design, construction and operation of the harpoon be completed with input from the shipboard geochemists of legs 141 and 146.

PCS: Manifold for extracting free and hydrated gases
A gas sampling manifold is required to obtain the contents and composition of free and hydrate gases. The existing manifold assembly of the PCS tool appears to be inadequate -due to large internal volumes- to conduct the necessary experiments with gas hydrate contained inside the pressure chamber. The SGPP concurs with the recommendation of the workshop participants that a previous successful gas sampling manifold (Keith Kvenvolden; USGS Menlo Park) and a new but untested design (Jean Whelan; Woods Hole Oceanographic Institution) be perfected by ODP with input from both of these experts as well as future shipboard geochemists.

Predictive equation for depth of gas hydrate stability
The temperature and pressure regime below the seafloor determines the stability field of pure methane and mixed gas hydrates. The SGPP concurs with the recommendation by the workshop participants that an analytical equation be tested and substituted for the graphic method -used unchanged since the days of DSDP- and that a software package, allowing numerical solutions for any environment of

gas hydrate stabilities, be developed for use aboard the JOIDES Resolution to improve safety measures.

Gulf of California-275:
This proposal remains of high interest to SGPP, but no new information was received.
Rating is 5.

Barbados Ridge-278:
The present version of this proposal, requesting 3 to 4 legs of drilling, discusses the problem only in a broad way with few specifics particularly for the geochemical objectives. This is unlike the earlier proposed studies. Two transects are proposed, a northern one with muddy sediments which includes somewhat better defined geochemistry objectives; the southern transect is sandy. Sites are mature in terms of geophysics but immature in terms of geochemistry and sedimentology. Suggest rewrite using new, primarily French, data (not included in this version), and in terms of legs with specific objectives. Suggest sequencing of legs in terms of a long-term drilling schedule. SGPP would like to see how the proponents will answer the fluid flow question and is concerned with the justification of the extraordinary large request for 3 - 4 drilling legs vis-a-vis other Atlantic drilling.
Rate as 4.

Mediterranean Ridge-330:
The addendum received includes coring on mud volcano and emphasizes fluid and geochemical objectives. The proponents need to give specifics of a hydrological model to identify flow paths and rates. At present they just talk about anomalies. Should explore the possibility that salts can be used as tracers. They also need to include heat flow numbers and new seismic data. Most attractive to SGPP is the fact that the site is located between two colliding continents; this represents an important end-member setting and hence an important type area of study.
Rate as 4.

Category 5: Paleocean chemistry/history

North Atlantic evolution-372:
SGPP generally likes this proposal because of potentially important objectives of paleocean chemistry of intermediate water masses. Proposal has a bit, but needs more emphasis on carbon cycle. Much better seismics (including 3.5 kHz) are required for sites, especially site 2 to clarify potential of slumping.
Rate as 4.

Equatorial Atlantic pathways-313:
SGPP reviewed this proposal previously; it appears better suited for category 2.
Rate as 4.

Cretaceous Atlantic-389:
The focus of this proposal is on biotic evolution and biostratigraphy and similar biological objectives, but will recover Cretaceous sediments and thus is of interest to SGPP. To get a higher ranking with this panel, the proposal needs to be directed towards carbon cycle, sediment mass balance and general themes published in the SGPP White Paper.
Rate as 2.

Mediterranean sapropels-391:

This proposal is aimed at comparing anoxic and high productivity origin of sapropels. It is very interesting to SGPP from a thematic point of view, but is quite immature at present; i.e. no sites are proposed. SGPP suggests U/Th for dating, include a depth plot, and expand rationale for drilling with JOIDES Resolution. Need to pick specific, optimum sites for sampling. Explain why longer time-series are needed. Also address potential problem in approach suggested with Br/I from bromides in ubiquiteous brines of the system. Organic geochemistry could be more developed; there is a problem with preservation of Mn-oxide spikes (as indicators for oxic environment) in subsequent anoxic sediments because they might not survive. SGPP has interest in heating effect on sapropels. OHP evidently had some serious criticisms of this proposal which SGPP finds puzzling.
Rate as 4.

Atlantic-Mediterranean gateway-323:
This revised version was in response to earlier SGPP criticism; panel feels that proponents have done their homework by adding "paleo" environmental objectives in relation to tectonic development of Alboran basin. Another emphasis is on contourite deposits outside the Mediterranean Sea. The paleoceanographic objectives include the history of the outflow. The region as an important one for studying of contourites in sandy sediments.
Rate as 3.

Environmental evolution of N. Pacific-247:
SGPP is unclear as to what extent these objectives are being drilled on the schedule Leg 145.
Rate as 4.

Neogene California current-386:
This revised proposal addresses the history of the California current, upwelling and productivity with plate deformation as a secondary objective. SGPP feels that these are first rate OHP-objectives; however, for it to attract SGPP's interest proposal needs to be directed towards carbon cycle, multiproxies for paleocean chemistry or similar themes.
Rate as 3.

Proposals with secondary SGPP objectives:
Atlantic

2/3 boundary-376:
The present version of this proposal does not address fluid circulation; also comments on metallogenesis and sources of metals are needed in order to concur with SGPP mandate. How are the objectives related to geochemical budgets? Is drilling justified or can much be accomplished by submersible work?
Rate as 3.

MARK area-369:
This proposal is to drill for fresh material to address petrologic/geochemical objectives related to partial melting and general structural setting. These are primarily tectonic and lithosphere objectives; it needs words about metallogenesis.
Rate as 3.

Aruba gap-384:
Covers primarily tectonic objectives related to the break-up of Pangea, intraplate deformation evolution of oceanic plateaus. Secondary objectives are those of ocean history, late cretaceous to neogene paleoceanography in particular the

effect of Panama closure. SGPP objectives apparently are third-order; Site 1 is suggested as a geochemical reference Site but the idea remains undeveloped; likewise current-controlled deposition in the Venezuela Basin is mentioned, but not further elaborated. Impressive geophysical and structure data and generally mature and well-prepared proposal.
Rate as 2.

Vema FZ-382: same area 376.
Rate as 1.

Oceanographer FZ-374:
Rate as 1.

S-reflector Galicia margin-334:
Rate as 1.

Late rift, early drift-363:
Rate as 1.

Ceara Rise-388:
This proposal requests a transect of 8 holes to study changes due to mixing of NADW and AABW water mass properties as the source for Indian and Pacific Ocean deep waters. It is most clearly within the OHP-mandate. Of SGPP interest is the resulting development of water chemistry, in particular carbonate saturation. This objective is recognized as an important one for carbonate preservation, but not developed. Likewise, the nutrient chemistry is mentioned but not developed. In addition this proposal could generate strong SGPP interest if it would address the chemical and sedimentological character of sediments from the Amazon River that dilute the paleontological paleocean chemistry record.
Rate as 4.

Atlantic continental margins-365:
This is a superleg proposal, where the priority 1 sites require 340 days of drilling. Overall drilling plan superseded by NARM-DPG report. SGPP interest in nature of overlying sediments, but a more specific rational, such as seismic sequence analysis, is needed. Also no comments about pore waters/fluid circulation and other SGPP themes. The SGPP objectives are to study sediment fluxes and sedimentary architecture in gateway positions between the northern and the central North Atlantic. The main time frame is the late Triassic to late Jurassic, and the time since the early Cretaceous. To SGPP three sites (NB1, NB6, NB2) are of interest: NB1 and NB6 are in a water depth of 1200 m (sed. thickn. 1600 m) and 4215 m (sed. thickn. 2200 m) to decode the int-rift and syn-rift shallow water sedimentation. The evolution from shallow to bathyal depth will be recorded in sites NB2 and NB6. NB6 is in a water depth of 3949 m (sed. thickn. 2060 m). The record of sediment fluxes may be related to eustatic sea level fluctuations. It may also be possible to study the sedimentary architecture below (fan style deposition) and above (current controlled sedimentation, sediment waves) seismic reflector A^u. The proposal has some potential for SGPP. Difficulties in drilling sediment thicknesses greater than 2000 m have to be resolved. Sites need to be organized in terms of legs with specific objectives and with sequencing of legs suggested.
Rate as 3.

Labrador Sea-392
SE Greenland margin-393
Hatton Rockall margin-394

Faeroe Bank margin-395
Faeroe Platform margin-396

The SGPP feels that this group of proposals on Atlantic volcanic margins addresses very interesting LITHP and TECP objectives, whereby sediments are considered as overburden to be drilled through. The exception is proposal 396 with some interest in sediment drifts. Proposal 392 with 5 sites could show entire sedimentary history of Labrador Sea; please develop. Also, proposal 395 has at least 1 site of possible interest to SGPP. All sites might be combined into a larger proposal; hopefully NARM-DPG will do that job. SGPP's sediment interests could be in provenance, mass balance, effects of hydrothermalism sea level (seismic stratigraphy), etc. Proposal 396 rate as 3, others rate as 1.

Proposals with secondary SGPP objectives
Mediterranean

Aegean Sea-383:
This proposal does not address SGPP interests; it is probably not possible to be modified to attract such interest.
Rate as 1.

New Mediterranean prospects-379:
This proposals is really two proposals in one, they should be separated. The Tyrrhenian Sea deep hole is to study 3 MY old peridotite, whereas the Mediterranean Ridge deep hole addresses geochemical fluxes and water flow. SGPP suggest that proponents get together with those of proposal 330 to make a joint proposal.
The second hole rate as 4.

Sardinian-African collision-364:
Rate as 1

Proposals with secondary SGPP objectives
Pacific

Bering Sea-390:
A proposal primarily of tectonic objectives; - at present immature.
No rating.

Jurassic Pacific crust-368:
Proposal to deepen hole 801C, including logging, permeability and a seismic experiment. SGPP needs to have information about work in progress before deciding on drilling deeper. Drilling would provide endmember of oceanic crust before subduction as valuable geochemical reference site.
Rate as 4.

Site 505 stress-373: This is a proposal to deepen hole to allow for stress measurement. Secondary objectives of interest to SGPP addresses the evolution of porosity and alteration of the crust near a ridge crest. However, there are no other sites nearby for comparison of such measurements. The proposal somewhat resembles objectives of other more extensive ridge crest drilling.
Rate as 3 or 4.

Ranking among themes

After completing the review of proposals the next step in ranking was to assemble all proposals into thematic categories and then rank them by consensus. The result of these deliberations are listed below with proposal number and rating vis-a-vis SGPP interest are in parenthesis.

Category 1: Sea Level
1 New Jersey margin sealevel (348, 5)
2 New Zealand margin sealevel (337, 5)
3 South Australian margin (367, 4)
4 West Florida sealevel (345, 4)
5 Marion Plateau (338, 4)

Category 2: Materials Cycling/Mass balance/Sediment Architecture
1 VICAP (380, 5)
2 Sediment instabilities Madeira abyssal plain (59, 4)
3 Navy fan (250, 5)
4 Atlantic-Mediterranean gateway (323, 3)
5 Argentine contourites and black shales (327, 4)
6 Equatorial Atlantic paleo chemistry (313, 4)
7 St. Lawrence ice sheet (341, 4)

Category 3: Fluids
1 Gas Hydrate ("335", 5)
2 Cascadia II (DPG, 5)
3 Return to 801 (368, 4)
4 NW Australian margin (340, 4)
5 Mediterranean Ridge (330, 4)
6 Barbados (378, 4)
7 New Mediterranean prospects (379, 4)
8 Florida Escarpment (332, 4)
9 Bransfield Strait (351, 4)

Category 4: Hydrothermalism and Metallogenesis
1 Sedimented Ridges II (DPG, 5)
2 EPR II (DPG, 5)
3 Valu Fa sulfide (360, 5)
4 TAG-hydrothermalism (361, 5)
5 Gulf of California (275, 5)
6 Endeavour Ridge (325, 5)

Category 5: Paleo-Ocean Chemistry
1 Mediterranean sapropels (391, 4)
2 Benguela upwelling (354, 4)
3 Ceara Rise (388, 4)
4 North Atlantic evolution (372, 4)
5 Neogene California Current (386, 3)

Supplemental Science Category
1 Navy Fan (S1, 5) -- Strongly supported, see previous discussion and recommendation.

Final Ranking

The final step in ranking was accomplished by voting each time on top-ranked proposals in each of the five categories.

1 Gas Hydrate
2 Mediterranean Sapropels
3 Sedimented Ridges II
4 New Jersey margin sealevel
5 VICAP
6 Cascadia II
7 Benguela current
8 Sediment instabilities-Madeira abyssal plain
9 EPR II
10 New Zealand sea level
11 Valu Fa sulfides
12 Ceara Rise
13 Return to 801
14 TAG-hydrothermalism
15 NW Australian margin
16 Mediterranean Ridge
17 Barbados accretion
18 South Australian margin
19 Gulf of California
20 North Atlantic water mass evolution

Deep Drilling

The SGPP had earlier noted possible deep drilling objectives for the Somali Basin and for a subduction zone from an island in the Aleutian chain. Due to time constraints during this meeting a discussion was postponed until the next meeting; SGPP considers requesting Mike Coffin and George Plafker to attend that meeting at Lamont to discuss deep drilling ideas and design detailed plan.

Staffing

The SGPP considered recommending co-chiefs for the Atolls and Guyots legs, but lack of effective geochemical sampling tools (wire line packer/water sampler) reduces desire to do this. The SGPP continues to support the nomination of M. Goldhaber for co-chief on the Cascadia I drilling (Leg 146) because of the high degree of interest that SGPP places on this leg, not the least being the implementation of the gas hydrate objectives. An important step towards implementing these objectives on Leg 141 (Chile triple junction) was the participation of designated co-chief scientist S. Lewis in the "Gas Hydrate Workshop". In general SGPP reiterates the Gas Hydrate Workshop recommendation that chemists with interests in gas hydrates be appointed as soon as possible so that the individuals can get design of PCS manifold underway and can think about the realities of PCS Phase II design, particularly construction of multiple pressure subassemblies.

Future meetings

Lamont, June 4, 5 and 6; R. Jarrard host; joint session with DMP
Zurich, November 5 - 6, J. McKenzie host; to follow Sea Level WG meeting in La Jolla, California on November 2 - 3.

Appendices

NARM-DPG	Report by R. Hiscott
Future ODP Legs	Summary by M. von Breymann
Pressure Core Sampler	Report by T. Pettigrew

North Atlantic Rifted Margins Detailed Planning Group Meeting
25-27/02/1991, Woods Hole
Proposal numbers considered: 310/11, 328, 334, 358, 363, 365, 366

Report to SGPP (OHP and SGPP concerns)

The proposals discussed by the planning group are essentially tectonic in their focus. Nevertheless, Mesozoic through Neogene sedimentary sequences will be drilled and, in some cases, these can be used to address questions that are important to SGPP and OHP. OHP has specific goals to monitor long- and short-term changes in water masses and in the exchange of water masses through constricted gateways. As a result, sites and groups of sites that will be of high priority to OHP must be selected by that panel from dedicated ocean history proposals. Information from sites selected to meet tectonic objectives will generally not help answer fundamental OHP questions, and may, in fact, be in locations where OHP objectives have already been met (e.g., Vøring Plateau). Nevertheless, some areas of OHP interest are very close to, or in the same place as, proposed NARM sites (e.g., proposal 328 deep site is below Arctic gateways Green 2 area off East Greenland). In these cases, proponents or DPG chairs should consult to determine if mutually useful sites can be selected. Other NARM proposed sites which are in areas of OHP interest are found in proposals 363 (NR1 has high potential for a "complete" section to monitor Late Cretaceous - Cenozoic deep-water changes) and 396 (Rockall and Iceland-Faroe Ridge). There is no strong OHP interest in proposals 310/311, 334, or 365 (unless sealevel story is more developed). SGPP is also interested in the development of contourite deposits (proposal 328 and Green 2 area).

SGPP has major interests in fluid movements through compacting and deforming sediments, hydrothermal circulation in areas of volcanicity, the sedimentary record of sealevel changes, and sediment mass balance information. No current proposals address the first two points, even though there should be an important story in young rifted margins, some volcanic. This is a disappointment. Proposal 365 (North Newfoundland Basin) makes an important step toward sealevel objectives by selecting sites near the wide Grand Banks "platform", that should contain coarser and finer deposits laid down at times of lower and higher sealevel, respectively (this is also a likely feature on the Iberia Abyssal Plain). Unfortunately, a major opportunity has been missed because a conventional, industry-type, seismo-stratigraphic analysis from basin to shelf, looking for unconformity-bounded sequences that could be tied to sealevel fluctuations, has not been attempted. SGPP would be more interested in this area as an opportunity for sealevel studies if the basinal deposits could be related to shelf-edge, low-stand unconformities and seismic sequences. In the Early Cretaceous, syn-rift deposits in this area may have been deposited near sealevel, and a record of rises and falls may be preserved, but this aspect is not well developed in proposal 365.

General conclusions and recommendations of the DPG

As first priorities, the DPG will probably recommend (1) drilling of one transect across the SE Greenland margin (proposal 310, conjugate to Leg 81) plus one new site (VM4) on the Voring Plateau at the toe of the dipping reflector sequence; (2) drilling of the N Newfoundland Basin - Iberia Abyssal Plain transect (proposal 365), and (3) drilling of the "S" reflector on the Galicia margin if and when deep drilling technology is available. With some reduction in the number of original sites, the total number of legs for (1) and (2), above, should be about 3 and 4, respectively. There will be a report from the DPG chair to PCOM that will more completely and correctly portray the views of the DPG membership.

Future ODP Cruises: Legs 140-146 February 20, 1991

Leg 140
Hole 504B/Hess Deep
September 16 - November 12, 1991

Co-Chief Scientists: Dr. Henry Dick (Woods Hole Oceanographic Inst., Woods Hole, MA)
Dr. Jorg Erzinger (University of Giessen, F.R.G.)

If Leg 137 succeeds in cleaning out the junk left in the bottom of Hole 504B during Leg 111, Leg 140 will be devoted to deepening the hole. A primary objective of JOIDES is to core as deeply as possible beneath the ocean floor to constrain seismic and petrologic models of the structure and evolution of oceanic crust. Drilling at Hole 504B addresses this objective, as this site represents a classic crustal profile and has significant drilling and downhole measurement efforts already invested. Hole 504B has penetrated more than twice as deep into oceanic basement as any other DSDP or ODP section, and is the only hole that reaches the sheeted dikes of Layer 2C. An oblique seismic experiment conducted during Leg 111 indicates that Layer 3 gabbros probably lie a few hundred meters below the present total depth of 504B (1287.8 meters into basement), within reach of the drill. Therefore, the primary goal of Hole 504B drilling is to core into Layer 3 and to conduct extensive downhole measurements in the newly cored section.

If Leg 137 is not successful in cleaning Hole 504B, Leg 140 will instead conduct operations at Hess Deep. Hess Deep is the deepest part of a westward propagating oceanic rift valley that is opening up the eastern flank of the equatorial East Pacific Rise in advance of the westward propagating Cocos-Nazca spreading center. Fault escarpments bounding the rift valley expose an extensive section of fresh crustal rocks. The eventual goal of Hess Deep drilling is to core a transect of sites across these fault escarpments to sample the complete section, from the lavas down to the upper mantle, of oceanic crust formed at the fast-spreading East Pacific Rise. General objectives of the drilling program are to study the igneous, tectonic, and metamorphic evolution of a fast-spreading oceanic crust, and to understand the process of rifting in young oceanic crust. The site occupied during Leg 140 (proposed site HD-2) would provide a continuous section of lower level plutonics and would drill across the Moho into shallow upper mantle.

Leg 141
Chile Triple Junction
November 17 , 1991 - January 13, 1992

Co-Chief Scientists: Dr. Stephen Lewis (U.S.G.S., Menlo Park, CA)
Dr. Jan Behrmann (University of Giessen, F.R.G.)

The region of the Chile Trench between 46°S and 47°S latitudes is the site of a ridge-trench collision, where the active Chile Ridge spreading system intersects the Chile Trench in a ridge-trench-trench triple junction involving the South American, Antarctic, and Nazca plates. Drilling in this region is aimed at understanding the processes active in the region of a ridge-trench collision, and to understand the geological expressions of these processes. These objectives will be addressed at five sites: three (SC-1, SC-2, and SC-3) along an east-west transect across the accretionary prism in the "pre-contact zone," and two more extending toward the south from the seawardmost site of the east-west transect along the toe of the prism to sample the "rift contact zone" (SC-4) and the "subducted rift zone" (SC-5).

Future ODP Cruises: Legs 140-146 February 20, 1991

Leg 142
Engineering, East Pacific Rise
January 18 - March 19, 1992

Chief Scientist: Dr. Rodey Batiza (University of Hawaii, Honolulu, HI)
Ops Superintendent: Mr. Michael Storms (ODP, Texas A&M University, College Station, TX)

Scientific objectives for drilling on the fast spreading East Pacific Rise include (1) determining the compositional and physical structure of "zero age" oceanic crust; (2) characterizing the physical and chemical nature of the fluid/rock interaction immediately above the crustal magma chamber; (3) characterizing the physical and chemical nature of the fluid flow and fluid/rock interaction in the permeable portion of the crust where large quantities of heat are transported advectively; (4) determining the temporal variability of lava compositions to help constrain models of the physics of partial melt supply to, and storage in, crustal level magma chambers; and (5) providing calibrations for geophysical observations that can be made remotely, such as with seismic reflection and refraction and electrical resistivity methods. Two primary axial sites (EPR-1 and EPR-2) have been identified to address these objectives; they are located at ~9°30'N latitude, where the axis is locally simple and where the generally strong "axial magma chamber" reflector displays its greatest breadth and amplitude. A secondary site (EPR-3) is located roughly 7 km west of the axis, off the axial volcanic ridge.

Leg 142 is scheduled as a third engineering test leg for Phase II of the diamond coring system (DCS), currently under development by the ODP Engineering Department. Operations will concentrate on establishing a stable hole at EPR-1, with operations of the Phase II DCS to depths of 100-200 mbsf. A program of downhole measurements will be conducted, after which the hole will be left hydrologically sealed.

Legs 143 & 144
Atolls and Guyots I & II
Leg 143: March 24 - May 19, 1992
Leg 144: May 24 - July 19, 1992

Legs 143 and 144 are scheduled to drill atolls and guyots in the western Pacific both to assess the plate tectonic history of the Pacific plate and to derive an independent sealevel history untainted by tectonic complexities inherent in continental margin sedimentary records. Specific drilling objectives include (1) Early Cretaceous sealevel fluctuations; (2) causes and timing of mid-Cretaceous carbonate platform drowning; (3) extent, magnitude, and timing of regional uplift associated with massive mid-plate volcanism in the western Pacific; (4) Early Cretaceous Pacific plate latitudinal changes and plate kinematics; (5) fixity of hot spots; (6) longevity and stability of the "Dupal" anomaly in mantle composition; and (7) Cretaceous history of the South Pacific "Superswell" and the Darwin Rise. Two sets of drill sites have been proposed to address these objectives: eight sites have been proposed to address Cretaceous and early Cenozoic history of the Marshall Islands area by drilling guyots and adjacent aprons, and nine sites have been proposed to address the problem of simultaneous Cretaceous drowning of widely separated guyots of the northwest Pacific.

PCOM has established an Atolls and Guyots Detailed Planning Group that is charged with constructing a two-leg drilling plan to address the atolls and guyots drilling objectives at the proposed sites. This DPG will meet in February 1991; their recommendations will be discussed at the April 1991 PCOM meeting, where specific drilling targets for Legs 143 and 144 will be finalized. Co-Chief Scientists for this leg have not yet been named.

Leg 145
North Pacific Neogene Transect
July 24 - September 21, 1992

Drilling a transect of sites in the subarctic North Pacific Ocean will address both paleoenvironmental and tectonic objectives. Paleoceanographic objectives include (1) history of surface ocean and atmospheric circulation, and latitudinal magrations of the Subarctic Front; (2) variations in deep-water circulation and chemistry through the late Neogene; (3) timing and nature of the major shift from calcareous to siliceous sedimentation in the middle Miocene; and (4) history of continental climate derived from eolian material and ice-rafted debris. Tectonic objectives are aimed at better understanding the configuration and evolution of mid-Cretaceous Pacific plate boundaries. These objectives include (1) determining the age and paleolatitude of Detroit Seamount, in order to test spatial stability of the Hawaiian hotspot during formation of the Emperor Seamount chain; and (2) ascertaining the age and origin of the Chinook paleoplate, in order to resolve differences between existing theories for mid-Cretaceous plate reorganization in the Pacific.

Seven sites have been proposed for drilling during Leg 145: three on Detroit Seamount (DS-1, DS-2, DS-3), one of the Patton-Murray Seamounts (PM-1), and three in the northwest Pacific (NW-1A, NW-3A, NW-4A). As there probably is not time to drill all of these during Leg 145, the Ocean History Panel has been charged with contacting proponents to remedy weaknesses in the existing proposals and advise PCOM in putting together a final cruise plan.

Co-Chief Scientists for this leg have not yet been named.

Leg 146
Cascadia Margin
September 26 - November 21, 1992

The overall objectives of drilling during Leg 146 are to make an assessment of the fluid and chemical budgets of the Cascadia accretionary margin, and to install two downhole observatories with the potential of indicating the temporal variability of margin hydrogeologic processes, conducting long-term permeability experiments, and obtaining fully equilibrated temperatures. These objectives will be addressed by drilling two transects of sites, one across the Vancouver Island margin (VI sites) and one across the Oregon margin (OM sites). The VI transect [proposed sites VI-1, VI-2d, and VI-5 (alternate=VI-3)] will test and calibrate three techniques for determining progressive fluid loss through diffuse expulsion and focused venting and fluid mass balance across the accretionary prism, and test a new model for formation of hydrate bottom-simulating reflectors that depends on upward fluid expulsion. The OM transect (proposed sites OM-3, OM-4, OM-7, and OM-8) will define fluid venting focused by fractures; the objectives are to study synergism of fluid flow and structural evaluation and and evaluate how flow may affect the geochemical cycle. Reentry cones will be set at Sites VI-5 and OM-3 and will be plugged with instrumented borehole seals to monitor downhole temperatures and fluid pressures on a longterm basis.

Co-Chief Scientists for this leg have not yet been named.

ODP OPERATIONS SCHEDULE

Leg		Departs Location	Departs Date	Arrives Destination	Arrives Date	Days at Sea *	In Port
136	OSN-1 - Oahu Hole	Honolulu	3/ 3/91	Honolulu	3/20/91	17	3/20- 3/21/91
137	Engineering 3A 504B - Cleanout	Honolulu	3/21/91	Panama	5/ 1/91	41	5/ 1- 5/ 5/91
138	E. Equat. Pacific	Panama	5/ 6/91	San Diego	7/ 5/91	60	7/ 5- 7/ 9/91
139	Sed. Ridges 1	San Diego	7/10/91	Victoria B.C.	9/11/91	63	9/11- 9/15/91
140	Engineering 3B 504B*/Hess Deep	Victoria	9/16/91	Panama	11/12/91	57	11/12-11/16/91
141	Chile Triple Junction	Panama	11/17/91	Valparaiso	1/13/92	57	1/13- 1/17/92
142	Engineering, East Pacific Rise	Valparaiso	1/18/92	Honolulu	3/19/92	61	3/19- 3/23/92
143	Atolls & Guyots A	Honolulu	3/24/92	Guam	5/19/92	56	519- 5/23/92
144	Atolls & Guyots B	Guam	5/24/92	Honolulu	7/19/92	56	7/19- 7/23/92
145	North Pacific Transect	Honolulu	7/24/92	Seattle	9/21/92	59	9/21- 9/25/92
146	Cascadia	Seattle	9/26/92	San Diego	11/21/92	56	11/21-11/25/92
147	Engineering, EPR+/ Hess Deep	San Diego	11/26/92	Panama	1/21/93	56	1/21- 1/25/93

* If cleaning operations successful on Leg 137
+ If DCS Phase III System Ready

Revised 1 /10/91

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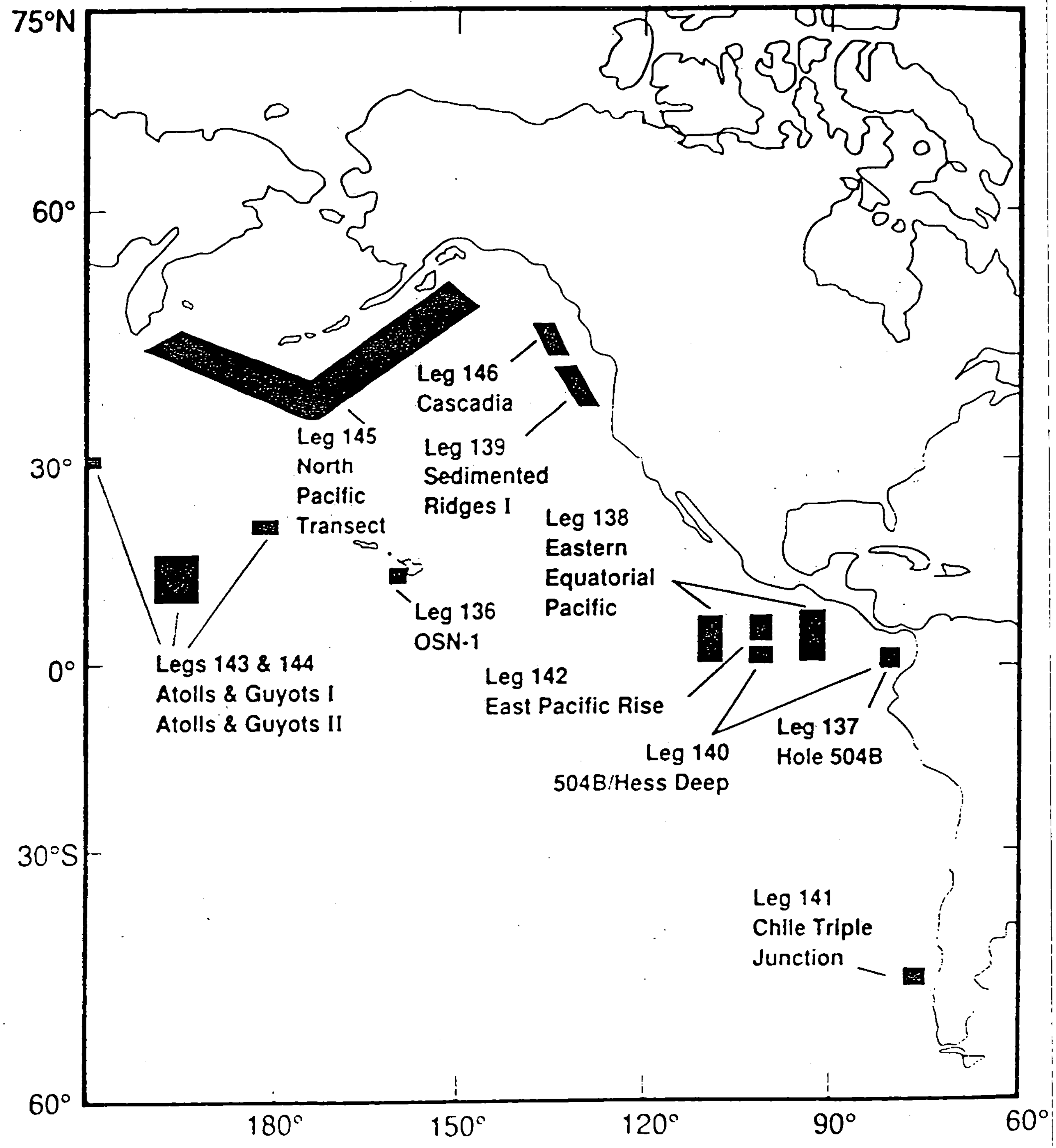


75°N
60°
30°
0°
30°S
60°
180°
150°
120°
90°
60°
Leg 146
Cascadia
Leg 145
North
Pacific
Transect
Leg 139
Sedimented
Ridges I
Leg 138
Eastern
Equatorial
Pacific
Leg 136
OSN-1
Legs 143 & 144
Atolls & Guyots I
Atolls & Guyots II
Leg 142
East Pacific Rise
Leg 140
504B/Hess Deep
Leg 137
Hole 504B
Leg 141
Chile Triple
Junction

PRESSURE CORE SAMPLER (PCS)
GENERAL DESCRIPTION

The Pressure Core Sampler (PCS) is a coring system capable of retrieving core samples at bottom hole pressures, under development by the Ocean Drilling Program (ODP). The PCS utilizes both current conventional oil field pressure coring technology and technology developed by the Deep Sea Drilling Project (DSDP). The PCS is completely compatible with the existing ODP bottom hole assembly (BHA) used for the Advanced Piston Core (APC), Extended Core Barrel (XCB) and Motor Driven Core Barrel (MDCB). The purpose of the PCS is three fold. First to be compatible with the APC-XCB-MDCB BHA. Secondly to retrieve a core sample while maintaining a bottom hole pressure of up to 689.7 atmospheres (10,000 psi) thus doubling the pressure capability of the earlier DSDP Pressure Core Barrel (PCB). And finally to retrieve a small core sample which can be transferred from the detachable sample chamber to a pressurized testing chamber while maintaining bottom hole pressure. This could not be done with the DSDP PCB. The core sample can then be accessed directly for scientific evaluation under bottom hole pressure and temperature conditions.

The PCS is a wireline retrievable, free fall deployable, hydraulically actuated pressure coring system. When the PCS is deployed, it lands and latches into the BHA and is rotated with the BHA during coring operations. It is fully interchangeable with the APC and XCB coring systems thus allowing a pressurized core sample to be taken at anytime from the mudline down to indurated formations and/or basement rock. The PCS recovers a nominal 42 millimeter (1.65 inch) diameter core samples, 0.86 meter (34 inch) long at pressures up to 689.7 atmospheres (10,000 psi).

The PCS is comprised of five main components or subassemblies; the latch, the actuator, the valve-accumulator, the ball valve and the detachable sample chamber. Each of these subassemblies is described in detail below (see Diagram A).

LATCH

The PCS Latch Subassembly is a modified XCB latch which serves five functions. First the latch subassembly contains the landing point for the PCS when deployed. The latch subassembly has a 4.000 inch outside diameter shoulder which can not pass the 3.82 inch inside diameter throat of the landing saver sub in the BHA, thus preventing the PCS from passing completely through the BHA. Secondly, by latching into the BHA, the latch subassembly transmits torque from the BHA to the PCS allowing it to trim the core to proper size for entry into the sample chamber. Thirdly, the latch subassembly holds a check ball sued in the actuation of the ball valve subassembly. When the latch subassembly is engaged by the wireline and an upward force is applied, ot automatically release the check ball allowing the ball to fall into the actuation subassembly. Finally, the latch subassembly diverts all flow through the PCS and provides a place for the wireline to automatically attach itself during retrieving operations. The latch subassembly is attached to the PCS by a three lug quick release allowing for handling in the same efficient manner as the other ODP coring systems.

ACTUATOR

The PCS Actuator Subassembly serves two functions. First it catches the check ball when released by the latch subassembly and by doing so stops all flow through the PCS until it strokes. Secondly, when pressure is applied to the PCS and the check ball has been released, the actuation subassembly unlatches and strokes through itself pulling the core tube containing the core sample through the ball valve into the sample chamber. As the core tube is pulled into the sample chamber the ball valve is closed and the upper end of the core tube is pulled into a seal receptacle thus sealing the sample chamber at both ends and trapping the core sample at hydrostatic pressure inside the PCS. When the actuation subassembly reaches the end of its stroke it latches once again and opens a circulation path through the PCS.

VALVE-ACCUMULATOR

The PCS Valve-Accumulator Subassembly contains a pressure maintaining mechanism, safety pressure relief mechanisms, a sampling port, temperature and pressure monitoring devices and the core tube. The pressure maintaining mechanism is a built in accumulator that maintains the pressure inside the sample chamber as a small volume change occurs during sealing and in the event of any minor seal leakage. The safety pressure relief mechanisms include an adjustable pressure relief valve set to automatically vent pressure above 689.7 atmospheres (10,000 psi). Should the pressure relief valve fail to release pressure a burst disk will rupture at 862.12 atmospheres (12,500 psi) relieving all pressure from inside the PCS. An access port allows sampling of gasses or fluids directly from the PCS sample chamber. A built in thermistor and pressure transducer allows for the connection of monitoring equipment to constantly monitor the temperature and pressure inside the PCS sample chamber. The sample tube is a non rotating metal tube with integral core catchers used to contain the core sample. During coring operations the core tube is extended through the ball valve subassembly into the cutting shoe. When the actuator subassembly is activated, the core tube is pulled through the ball valve into the sample chamber.

BALL VALVE

The PCS Ball Valve Subassembly is the sealing mechanism on the bottom of the PCS sample chamber. It also is the connection point for the PCS cutting shoe used to trim the core sample to size. During deployment and coring operations the ball valve is open with the core tube extended through it into the cutting shoe. When the actuation subassembly is activated and the core tube has been pulled through the ball, the ball is rotated into the closed position sealing the lower end of the sample chamber. The ball valve subassembly also provides a means for connecting the sample chamber to a pressurized testing chamber. This is done by removing the cutting shoe and using the threaded end to connect to the test

chamber. The ball valve subassembly also contains the pressure containing body of the sample chamber. The ball valve subassembly also contains the pressure containing body of the sample chamber and the seal receptacle used to seal the upper end of the sample chamber.

DETACHABLE SAMPLE CHAMBER

The PCS Detachable Sample Chamber is made of the ball valve and valve-accumulator subassemblies. It is 92.2 millimeters (3.75 inches) in diameter, 1.5 meters (5 feet) long and is attached to the PCS by quick release connections which allow the pressurized sample chamber to be removed from the rest of the PCS for easier handling. Since the valve-accumulator subassembly is an integral part of the detachable sample chamber, the pressure and temperature can be continuously monitored. Also, gas and fluid samples can be taken directly from the sample chamber.

CUTTING SHOES

The PCS uses a specially designed pilot type cutting shoe. The available cutting shoe cutting structures for the PCS are both hard and soft matrix impregnated diamonds, surface set diamonds, geoset demands as well as standard hard facing.

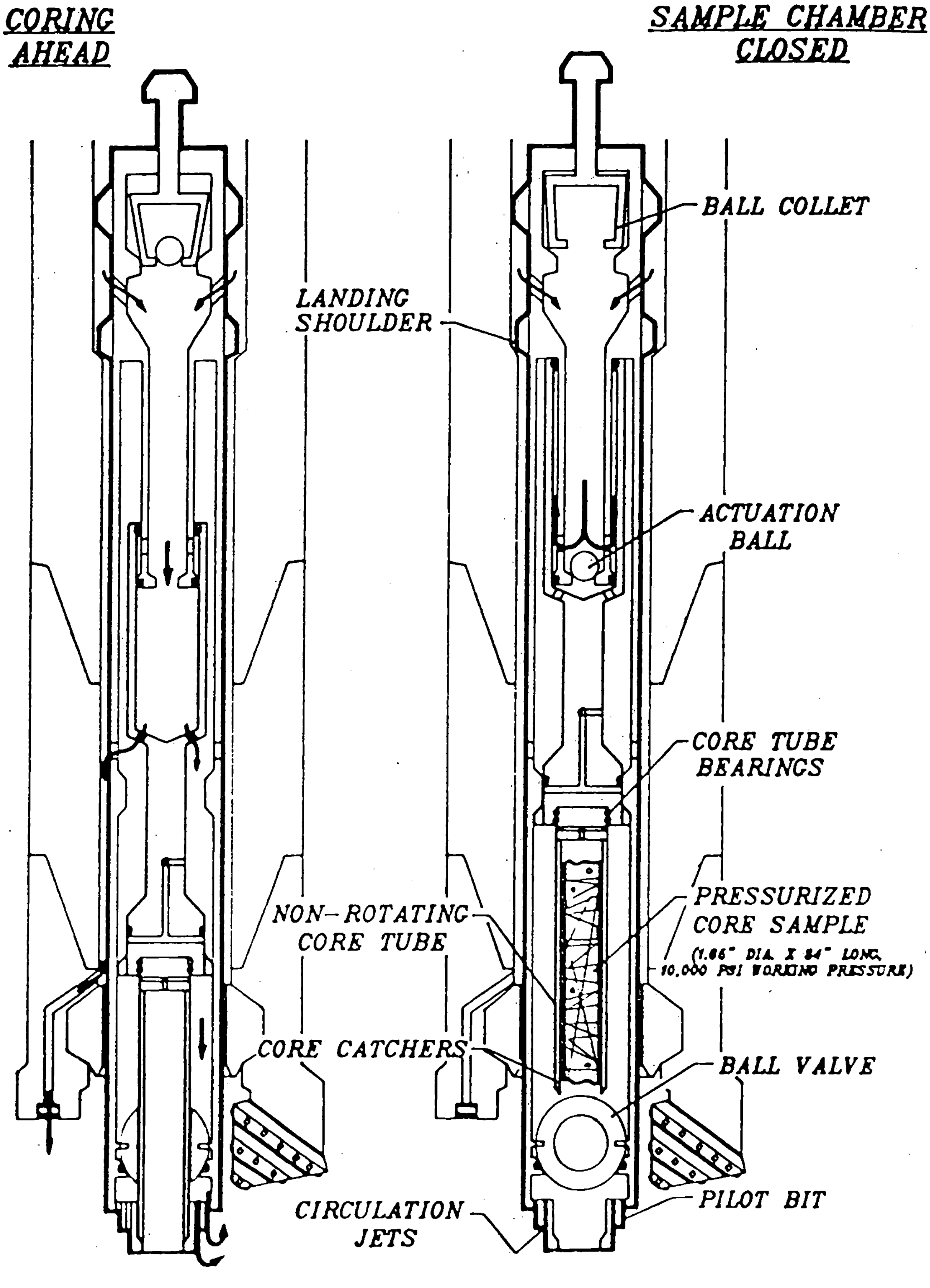
The PCS is free fall deployable and therefore is dropped down the drillpipe and landed in the BHA. The PCS is rotated by the top drive via the latch and drill string-BHA. During coring operations the rig pumps maintain flow down the drill string to keep the hole open and to cool/lubricate the PCS cutting shoe. Once the core has been cut the rig pumps are secured, the wireline is attached to the PCS and an up strain is applied to the PCS latch to release the check ball. The wireline is then slacked off and the rig pumps are restarted slowly, letting the pressure build to activate the actuator and stroke the sample chamber closed. When circulation is once again established the sample chamber has been closed and the PCS is retrieved like any other wireline core barrel. Once on deck the detachable sample chamber is removed from the PCS, placed in a portable temperature controlling bath/safety shroud where temperature and pressure monitoring equipment is attached. The sampler chamber can then be safely moved off the rig floor for scientific evaluation.

000332

OCEAN DRILLING PROGRAM
PRESSURE CORE SAMPLER (PCS)
DATA

Working Pressure	680 bar (10,000 psi)
Number of sample ports . .	2 - 1/4" NPT female
Core Diameter	42 mm (1.65 in)
Pressurized Core Length . .	86 cm (34 in)
Sample Chamber Length . .	1.7 m (66 in)
Sample Chamber OD	92 mm (3.75 in)
Actuation	Hydraulic
BHA Compatibility	APC/XCB/MDCB

PRESSURE CORE SAMPLER (PCS)
OPERATING SCHEMATIC



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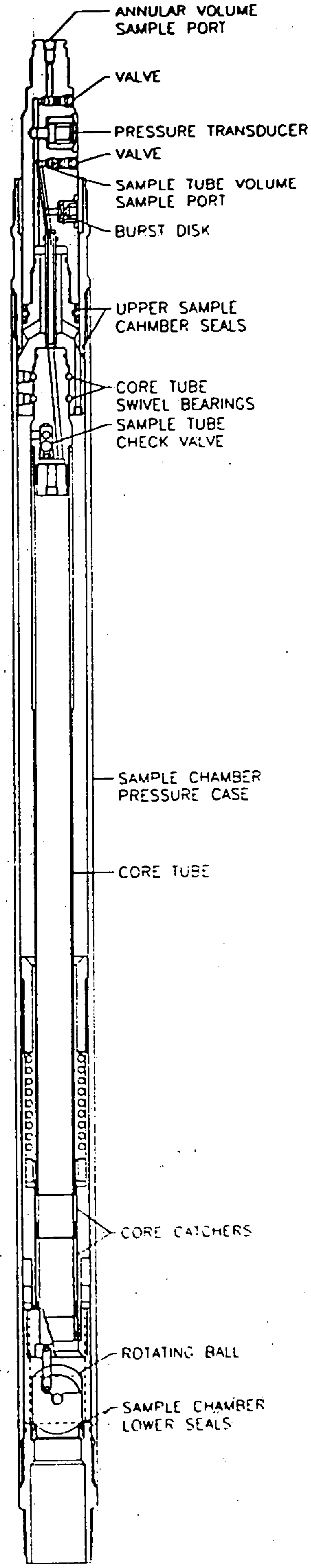


PRESSURE

CORE

SAMPLER

SAMPLE

CHAMBER

ODP

PRESSURE

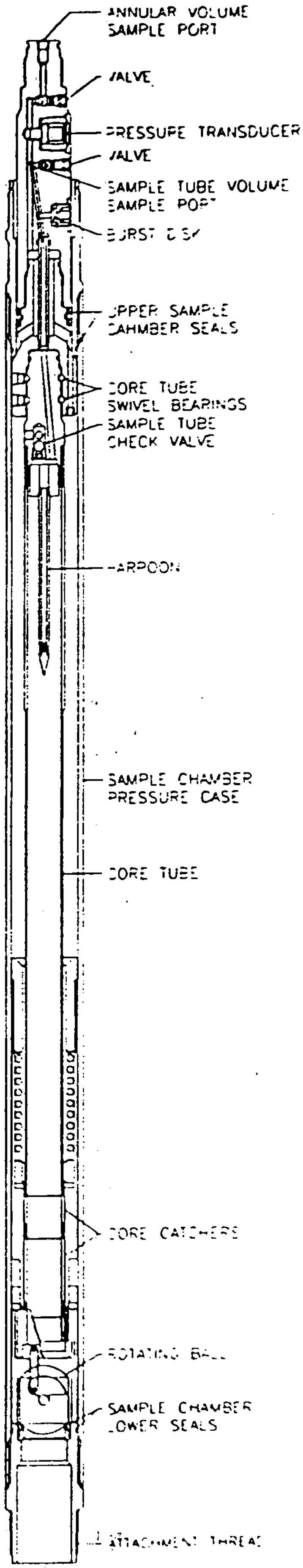
CORE

SAMPLER

W/HARPOON

SAMPLE

CHAMBER



OCEAN DRILLING PROGRAM
PRESSURE CORE SAMPLER (PCS)
DEPLOYMENT HISTORY

4 March 1991

1) Leg 124E, Hole 772

Water core taken at 1528 m, 100% hydrostatic pressure maintained.

2) Leg 124E, Hole 772

First coring attempt at 1678 m, 100% core recovery, 20% hydrostatic pressure maintained. Pressure loss attributed to sticking accumulator piston.

3) Leg 124E, Hole 773

Core cut at 1871 m, 100% core recovery, 100% hydrostatic pressure maintained.

4) Leg 131, Hole 808F

Coring attempted at 4753 m, 0% core recovery, 0% hydrostatic pressure maintained. Tool "sanded up" making the tool inoperable.

5) Leg 131, Hole 808G

Core cut at 4881 m, 80% core recovery, 5% hydrostatic pressure maintained. Full hydrostatic pressure was maintained when tool reached rig floor, pressure lost during 45 min cold storage. Pressure loss was due to partially damaged sample chamber upper seal of faulty cut off valve.

OCEAN DRILLING PROGRAM
PRESSURE CORE SAMPLER (PCS)
STATUS REPORT

4 March 1991

Only one PCS Phase I prototype tool exists.

Gas and fluid samples only can be collected under bottom hole pressure with the current PCS.

The PCS is currently in College Station for refurbishment and installation of high temperature seals for anticipated use on Leg 139, Sedimented Ridges I (10 July/11 Sept 1991).

The only sampling manifold that exists is a make-shift assembly of standard off-the-shelf high pressure plumbing including a high pressure back pressure valve.

Phase II PCS tentatively scheduled for use on Leg 146, Cascadia (25 Sept/21 Nov 1992).

Development of the "Lab Chamber" has not been resolved.

000338

OCEAN DRILLING PROGRAM
PRESSURE CORE SAMPLER (PCS)
DEVELOPMENT PLAN

4 March 1991

PCS PHASE I

Objective - to develop and test a functional PCS concept.

Provide for gas and/or water samples under bottom hole pressure.

No capability of core transfer under pressure.

Status - Phase I has been completed.

PCS PHASE II

Objective - to develop and test a functional PCS tool.

Provide for gas and/or water samples under bottom hole pressure.

Provide for transfer of pressurized core samples while maintaining bottom hole pressure.

Status - tentative Phase II development schedule is to have a functional PCS ready for Leg 146, Cascadia (26 Sept/21 Nov 1992).

LAB CHAMBER (PHASE III?)

Objective - to develop a lab chamber capable of receiving PCS core samples and allow access to the core samples for scientific purposes while maintaining bottom hole pressure.

Status - development of the lab chamber has not been resolved.

JOIDES TECTONICS PANEL MEETING, MARCH 21-23, 1991 DAVIS, CALIFORNIA

EXECUTIVE SUMMARY

RECEIVED
APR 1 1 1991
Ans'd...........

1. 1992 SCHEDULE: TECP registered three concerns:

a. First, the 1992 drilling schedule allows only 39 days of drilling on the Chile Triple Junction (CTJ), which is 4 days less than the minimum expressed by the proponents and Co-Chief Scientist-designate Jan Behrman for an optimum leg. TECP requests that changes in the port locations be considered in order to squeeze a few days from the transit schedule to devote to CTJ drilling.

Second. the lack of site-survey information on the proposed Hess Deep leg, in addition to the fact that the two working cross-sections on which the drill-site may be based cannot be balanced, make it hard to predict what the drill will encounter. A serious mistake is unlikely, but MOHO penetration should not be the only objective of the 1992 leg.

Third, TECP is concerned about coral recovery problems and its potentially negative impact on 2-leg program of atolls and guyots.

2. TECP is finalizing a document, by former member Mike Etheridge, about proposal quality and the review process. It has prepared a draft checklist of items expected in proposals, site surveys, and core descriptions (APPENDIX 1).

3. Offset drilling--Improved structural information is critical--a working group or DPG is needed. Two tectonic themes are dominant--formation of lithosphere at spreading center, and its disruption. Drilling shoUld be one part of comprehensive geological/geophysical study

4. TECP concurs with NARM DPG that the two-traverse plan be considered as a package

5. GLOBAL RANKINGS:

TECP GLOBAL RANKINGS, MARCH 1991

RANKING	PROJECT/PROPOSAL (Proposal #'s in parentheses)	AV. SCORE	ACHIEVABLE IN NEXT FOUR YEARS
1.	North Atlantic DPG 4 of 7 legs	13.25	YES
2	Mediterranean collison zone 1 leg (323A, 330A, 379A, 383A)	10.92	YES
3.	Chile Triple Junction leg 2 (362-Rev2--pre and post collisional zones)	8.91	YES
4.	Equatorial Atlantic margin (346/A Rev.)	8.83	YES
5.	Hess Deep-2nd leg (A tectonic leg, as yet unsubmitted, not the one proposed in the East Pacific Prospectus)	8.08	
6.	Caribbean crust (343A, 384ARev)	6.33	
7.	Western Woodlark Basin (265D, Add)	5.83	

8.	Barbados next leg (378A Rev)	5.18	YES
9.	Galicia S reflector (334 Rev)	4.75	YES
10.	SE Newfoundland ridge (363)	4.67	YES
11.tie	Slow offset drilling (A not-yet-proposed leg emphasizing the drilling component of a comprehensive study of the tectonics of formation of offset drilling sites)	4.09	
12.	N. Australian collisional margin (340D)	4.09	
13.	Red Sea, Gulf of Aden (e.g. 119, 140, 219)	4.0	
14.	Cascadia (second leg of DPG proposal)	3.82	YES
15.	Tyrrhenian Sea (e.g. 12A)	3.58	
16.	Labrador Sea (366A)	3.33	YES
17.	Cayman Trough (333A)	3.0	YES
18.	Stress at hole 505 (373E)	2.33	YES
19.	South Atlantic margins (327, 381)	2.08	
20.	Old (south) Australia margin (e.g. 65B)	2.0	

6. STATUS OF TECTONIC THEMES:

Many themes have received relatively little attention. TECP feels that a number of OTR's (ODP TECP RFP's) may be called for.

a. Rifted margins--much interest, subject of DPG, many proposals
b. Sheared (translational margins)--relatively little attention paid so far to tectonic questions. Possible subject of RFP
c. Convergent margins--much interest, many recent legs. Need to finish work in Chile, assess status of Cascadia, Barbados. Oblique convergent margins possibly a subject of RFP
d. Divergent oceanic plate margins--tectonic themes largely missing from the 20 or so proposals. Need conjugate approach on slow-spreading margins, more tectonic/structural input on fast-spreading ridges, new attack on back-arc basins. Need RFP on these subjects.
e. Plateaus, microcontinents, aseismic ridges, and anomalous basins. Considerable recent activity. Possibly need RFP for joint land/sea/drilling attack on origin of Caribbean plate.
f. Driving forces (stress, intraplate deformation). Need to continue borehole televiewer as integral part of logging. TECP encourages development of slim-hole televiewer. Possibly need RFP on intraplate deformation in the NE Indian Ocean.
g. Plate history, sea level changes. Prime target for watchdogs, as no project is worth an entire leg. Need more attention on basement ages, Cretaceous quiet zone, Mesozoic and Pacific hot spot tracks, "regional" problems such as Caribbean, timing of initiation of first oceanic crust in rifted margins.
h. Collisional margins--complex subject difficult to formulate feasible drilling projects. Need combined land/sea/drilling studies. Foreland basins need more attention.

7. TECP watchdogs are:
1. Alistair Robertson--Transform Margins
2. Steve Cande, Tanya Atwater--Plate history, sea level change, magnetic questions
3. Dale Sawyer--Young rifted margins

4. Hans-Christian Larsen--Old rifted margins
5. Jeff Karson--Mid-ocean ridges
6. Yujiro Ogawa--Marginal basins
7. Casey Moore/Jan Behrman--Convergent margins (normal subduction)
8. Phil Symonds--Convergent margins (collisional)
9. Mark Zoback--Stress and mid-plate deformation

8. DEEP-DRILLING--Two model deep-drilling sites in volcanic-poor rifted margin proposals have been prepared and discussed with engineers. Model sites for a volcanic-rich rifted margin and accretionary prism are being prepared.

9. TECP recommends that proposals not renewed three (3) years after review shall be considered no longer active.

000342

JOIDES TECTONICS PANEL MEETING, MARCH 21-23, 1991
DAVIS, CALIFORNIA

DRAFT MINUTES

PRESENT:
Eldridge Moores, UCD Chairman
Tanya Atwater, UCSB
Jan Behrmann, Germany
Steve Cande, Lamont-Dougherty
Jeff Karson, Duke U
Hans-Christian Larsen, Denmark
Alain Mauffret, France (substitute for J. Bourgois)
Casey Moore, UCSC
Yujiro Ogawa, Japan
Mike Purdy, WHOI
Alastair Robertson, UK
Dale Sawyer, Rice U
Phil Symonds, Australia
Mark Zoback, Stanford U.

LIAISONS
Shirley Dreiss SGPP
Laura Stokking, ODP
Brian Tucholke, ODP

APOLOGIES:
K. Klitgord, USGS
S. Cloetingh, LITHP Liaison

INTRODUCTION

Eldridge Moores opened the meeting and welcomed the panel to Davis. The panel welcomed new members Steve Cande, Jeff Karson, Phil Symonds, Alastair Robertson, and Mark Zoback. Moores outlined the Agenda.

AGENDA
Welcome and Introductions
Minutes of November 1-3, 1990 meeting in Paris
Report of PCOM Meeting
Report from Liaisons
Discussion of draft documents entitled "Discussion paper on proposal presentation and review processes in ODP" by Mike Etheridge, and "Information expected in drilling site proposals"
Discussion of draft document entitled "Tectonic features to be expected along mid-ocean ridges"
Watchdogs
Offset drilling
Discussion/ranking of new proposals
Global prioritization of all proposed ODP Programs
Location of Fall 1991 Meeting
Other?

REPORT OF PCOM MEETING

Eldridge Moores reported on the PCOM meeting, pending the late arrival of Brian Tucholke. TECP voting procedures will be changed to conform to PCOM regulations.

Regarding the 1992 schedule, TECP was pleased to see two of its highly-ranked Pacific legs---Chile I and Cascadia I included. TECP registered two principal concerns.

First, the 1992 drilling schedule allows only 39 days of drilling on the Chile Triple Junction (CTJ), which is 4 days less than the minimum expressed by the proponents and Co-Chief Scientist-designate Jan Behrmann for an optimum leg. TECP registered these concerns to PCOM Liaison Brian Tucholke after his arrival with the request that changes in the port locations be considered in order to squeeze a few days from the transit schedule to devote to CTJ drilling.

Second. the lack of site-survey information on the proposed Hess Deep leg, in addition to the fact that the two working cross-sections on which the drill-site may be based cannot be balanced, make it hard to predict what the drill will encounter. This issue was revisited later in the program (see below).

LIAISONS' AND OTHER REPORTS

ODP Laura Stokking reported on Legs 133 (also Phil Symonds), 134, 135, and 136. Many records fell on 133, resulting in flood of information. Leg 134 recovery was generally good, but poor in guyot. Leg 135 contained many surprises. Leg 136 was going well.

TECP expresses concern about coral recovery problems and its potentially negative impact on 2-leg program of atolls and guyots.

SGPP Alastair Robertson and Shirley Dreiss reported on the March, 1991 meeting from the minutes and their conversations with attendees SGPP held a 1 1/2 day workshop jointly with the Safety Panel on the problem of gas hydrates. We need a leg devoted to hydrates to make basic measurements, possibly in the Atlantic. Free gas is unlikely to be present in the hydrate layer, so it is not a serious safety issue with holes in such sites. With regard to global ranking, SGPP ranked 34 highly-rated proposals in five categories--sea level, material cycling, fluids, hydrothermal and metallogenesis, and paleogeochemistry. SGPP does not explicitly consider the tectonic aspects of sedimentation.

LITHP Jeff Karson (TECP liaison to LITHP) reported on the meeting the previous week. LITHP expressed its extreme dismay at the lack of appointment of a DPG for offset drilling. LITHP is interested in proposals on large volcanic provinces, the Red Sea, and deep drilling in oceanic crust in slow, fast, on-axis, and off-axis locations.

ATOLLS AND GUYOTS DPG Tanya Atwater reported on the recent meeting. The charge was to condense two proposals of 1 1/2 legs each into 2 legs; the process went surprisingly well. TECP's interests are in timing of hotspot tracks, tectonic nature of the south-central Pacific superswell, and origin of mid-late Cretaceous volcanic episode. Yujiro Ogawa mentioned the possible origin of seamounts southeast of Japan as reactivation of faults parallel to magnetic anomalies, rather than as hotspot tracks. The legs will be one in the Mid-Pacific Mountains, with a possible port in Majuro, and a second leg towards Japan. Included are two mixed pairs on atolls and aprons. Seamounts are of three types--planed volcanics, volcanoes with reefs, and true atolls. Drowning of Pacific atolls in Aptian-Albian time possibly correlates with abrupt increase in world-wide sea floor spreading activity and with dieoff of Tethyan rudists in Mediterranean--are they really synchronous? Site survey and core recovery problems were discussed. Some new site survey data are available Possibly lagoonal sites just behind reefs are optimal for core recovery.

NORTH ATLANTIC RIFTED MARGIN (NARM) DPG Hans-Christian Larsen, NARM-DPG Chair, distributed its report. Proposals considered in planning include: 310-SE Greenland, 311-Rockall trough, 328 NE-Greenland, 334-Rev-Galicia S-reflector, 358-Vøring transect, 363-SE Newfoundland ridge, 365Rev-Non-volcanic margins. Not considered were 3902, 393, 394, 395, 396, 363-add. The DPG reduced 15-25 legs to about 7. A second meeting has been requested. TECP revisited this matter after proposal review.

DEEP DRILLING:

Dale Sawyer reported on discussions with engineers on his two model deep-drilling proposals from the North Atlantic non-volcanic margins proposal. The sites were : NB3 to penetrate substantial thicknesses of sediment to basement, and G1a to penetrate great thicknesses of basement. The NB3 model was in 4000 m water, and included 2260 m sediments and 40 m basement for a total of 6300 m. drill string. It would require about 46 days plus science plus logging plus contingencies. It requires new slimhole drilling capability, which should be tested soon. Continuous coring is impracticable; multiple casing is required. The G1a model includes 5180 m water. 1700 m sediments, and 1800 m basement, for a total of 8680 m drill string, which exceeds the weight capacity of the derrick in all be flat calm. It would require 35 days plus science plus logging plus contingencies to basement. The engineers cannot estimate basement penetration rate. Conclusion: not possible with current ship configuration. Deep drilling site possibilities are very site-dependent. We need to consider deep-penetration holes in shallow water, e.g. hole 735 B or on the Mediterranean ridge. Casey Moore will prepare a model site in an accretionary prism, for which closed circulation and pressure control is key. Hans-Christian Larsen will present a model deep volcanic margin site. TECP will explore the possibility of having an engineer at the next meeting to discuss engineering problems, and/or Dale Sawyer will prepare for TECP a report on deep drilling limitations.

OCEAN SEISMIC NETWORK (OSN)

Mike Purdy reviewed the objectives of the program. The first experimental site is being drilled. Instruments are still in developmental stage. There are three issues--data, power and timing. The latter two are in hand, but data recovery is a problem. Telemetering, satellite, and internal recording are the possibilities. There will probably be many failures. TECP's role with OSN is to identify holes that, if a re-entrycone and appropriate casing are left, can serve as an OSN site. There are areas on the sea floor that have been identified as high priority. There is now liaison between JOIDES and the Federation of Digital Seismic Networks, a committee that talks about network siting.

DISCUSSION OF DRAFT DOCUMENTS

A discussion of all three draft documents ensued. TECP decided to forward Mike Etheridge's to PCOM after he has a chance to review and revise it if he so desires. Chair will incorporate items from Etheridge's letter and other two documents into a TECP checklist to be forwarded to PCOM and Site Survey Panel. (SEE APPENDIX 1 FOR DRAFT CHECKLIST!)

"LETTER FROM FRANCE" BY YVES LANCELOT

TECP discussed the letter in terms of the future of ODP and the question of focused themes vs proposal-driven science. The project as a whole walks a thin line between seeing that major questions answered (central control) vs. diversification and democracy. TECP felt that it is not necessary that ODP should control everything--some diversification is inevitable and even desirable. The total effort should be cooperative, however. All representatives of non-USSAC organizations indicated that there is considerable support for continuation in ODP.

OFFSET DRILLING

At Moores' request, Jeff Karson discussed his analysis of the structural data available from Hess Deep, based in part on his participation in the Alvin dives. Karson described how little is known about the structure of the Hess Deep area--the published cross-sections reflect this. He described how he and his postdoctoral fellow, Steve Hurst, had constructed alternative balanced cross-sections that predict substantial differences in rocks to be expected in the various proposed drill sites. TECP concluded that a serious mistake is unlikely even without new site data beforehand, because the acquisiton of new information about the lower crust is fairly certain. The lack of predictability about what will be encountered in a given hole means, however, that at this time MOHO penetration should not be the only objective of the 1992 leg. Any future leg in this region should have a strong tectonics-structural input. Future drilling should be only one part of a comprehensive field structural/geophysical survey aimed at addressing 1) the tectonic development of the East Pacific Rise Crust exposed in the walls of the Deep; and 2) the nature of the aseismic extension giving rise to the Deep itself, and its relation to the Galapagos propagator. Karson agreed to prepare a draft paper on this subject for TECP to forward to PCOM.

Improved strructural information is critical for offset drilling; a working group or DPG is called for.. We discussed seismic strategies, including VSP; staffing requirements for structural geologists, and need for data acquisition for improving structural information. TECP will join LITHP in addressing a letter to PCOM about the need for an offset drilling working group or DPG. TECP emphasizes the need to address the two-fold nature of tectonic questions surrounding any such site or sites--1) the tectonics of the formation of the crust and mantle at the spreading center, and 2) the tectonic significance of the dismemberment and exposure in the proposed offset sites. Any drilling that addresses adequately these tectonic questions will be one part of a comprehensive geological/geophysical study of the whole region including the site or sites.

PROPOSAL REVIEW

(N.B. In conformity with PCOM guidelines, any proponents were absent from the room during all discussion and voting on a given proposal).

52 Add/rev. Continental margin sediment instability investigation by drilling adjacent turbidite sequences

This is a well-formulated proposal. Although the proposal does not test high-priority tectonic thematic objectives, TECP is interested in understanding turbidite-depositional signatures associated with sealevel changes. Specifically, we would be interested in verification of the hypothesis that large turbidites are emplaced during rising and falling of sea level as opposed to low stands. More consideration shold be given to the mechanics of triggering turbidites during changes in sea level and any possible distinction from seismic triggering.

Ranking: 2, mature.

323-Rev. The Alboran Basin and the Atlantic-Mediterranean gateway....

This proposal to examine Neogene evolution of continental basement overthrusting and extension in the Alboran Sea addresses the general TECP theme of understanding deformation processes at convergent plate boundaries, as well as specific objectives such as the dynamics of interaction of extensional and collisional structures. The other part of the proposal on the development of the Atlantic-Mediterranean gateway, with its paleo-environmental goals, does not address high-priority TECP objectives, but recognises the influence of tectonics on the gateway and thus on sedimentary facies distribution.

TECP feels that the global significance of the collisional processes examined, and the reasons for studying them in this area, needs to be better argued within the proposal. This is a complex area, and clarification of the tectonic setting of each of the sites, along with a re-think of site seismic interpretations and their ambiguities, should improve the proposal. Clear links need to be made between the expected results ~~of~~ at each site and the global themes. The proposal would benefit from the addition of subsidence curves from the existing shelf wells, particularly those in the Miocene grabens, and site prognoses containing explicit predictions of sediment types. This will give an indication of the extent to which drilling will be able to constrain the subsidence history of the grabens, and thus the relationship between collision and extension. Structure contour and isopach maps, showing the distribution of the major sequences between proposed sites, would improve the proposal, as would a simple figure illustrating the general setting and proposed evolution of the Alboran basin. Additional constraining data needed to achieve the objectives could be pinpointed, showing which of these data is existing, and what will come from ODP drilling. Is there a location within the Alboran Basin where the objectives of Site AL-1 could be better achieved (i.e. more substantial recovery of middle Miocene and early Miocene section in a clear syn-rift configuration) with less than the 3000m of penetration presently proposed? Given that the region has been explored for petroleum, has consideration been given to potential safety problems related to ODP drilling?

It is clear that important collisional tectonic objectives can be addressed in the Alboran Sea. TECP feels that consideration of the above comments will help the proponents to revise their potentially exciting proposal and produce a well-focused and achievable ODP drilling program.

Ranking: 4, Immature.

334-Rev. Galicia margin S reflector and ultramafic basement

TECP is very interested in drilling of the S reflector in a location where it is likely to represent a basement contact. We look forward to seeing seismic data, particularly velocity analyses, that are currently underway. We are especially interested in seeing drilling that will test the "shear zone" hypothesis for the Iberian margin. The correlation of S' to S (and other reflectors in the area) will help make a more convincing case for any of the drill sites.

Ranking: 4, mature.

363-Add. Paleoceanographic record at proposed drillsites NR1, NR2, and NR3.

This addendum to proposal 363 has little or no tectonic thematic interest. The original proposal continues to have high thematic interest. The addendum, which addresses OHP and SGPP interests, does not degrade TECP interest in the original proposal.

TECP formally discussed the original proposal, and there were two suggestions to the proponents:

1) Why extend the longitudinal drilling mostly northward? The J-anomaly ridge appears simpler to the south.

2) One panelist asserted that the DSDP hole on the J anomaly missed the magnetic source region and, therefore, was not really viable as a part of a longitudinal transect.

Ranking: 1, no maturity box checked.

365-Rev Conjugate passive margin drilling--North Atlantic Ocean

The two proposed transects need to be presented (including cross-sections), taking into account the rift basins landward of the proposed study areas. It is pertinent to have a complete structural framework, including a proposed (semi-) balanced cross-section showing tectonic evolution, expected subsidence (amounts, lateral distribution, etc.). The structural interpretations shown on seismic profiles must be improved and associated with more rigorous seismic stratigraphic analysis, tieing into existing wells (commercial or scientific). Seismic imaging of deep targets on the Northern Newfoundland Basin part must be improved and data from the Iberia Abyssal Plain part migrated. Multi-channel seismic reflection data are needed for the North Flemish Cap part. Basement sampling in the northern Newfoundland Basin is important, and its feasibility must be documented

Ranking 4, mature.

389 Cretaceous N-S traverse in the western South Atlantic

As presently written, this proposal has no tectonic component. Furthermore, the proponent has not analyzed existing cores to demonstrate that the method works. If this proposal is rated highly by other panel(s) and is developed furthur, TECP requests that the proponent acquire a co-proponent with tectonics expertise, as several sites could be chosen to answer interesting tectonic questions, without detracting from the biological objectives

Ranking: 1, immature

390-Drilling in the Shirshov Region.

TECP welcomes this first proposal from our Soviet colleagues. The proposal, however, requires substantial development before TECP can carry out an effective review. Several important tectonic problems can be tackled by a Bering Sea drilling program. This proposal needs modification so that it effectively links the anticipated drilling results to process-oriented back-arc tectonics.

TECP encourages the proponents to develop this proposal by defining further exactly how the drilling will elucidate the origin and evolution of the Shirshov ridge. In addition, we encourage the proponents to establish contact with David Scholl of the U. S. Geological Survey, Menlo Park, who had a Bering Sea drilling proposal already pending with JOIDES. A combined proposal that addressed a suite of objectives in the Bering Sea would receive substantial attention from our panel.

Ranking: No ranking, too immature.

391. Depositional history and environmental development...sapropels in the eastern Mediterranean

This is an exiciting proposal to drill sapropels in the eastern Mediterranean with a view to testing alternative paleoceanographic hypotheses of organic matter preservation. As written, the tectonic objectives of the proposal are limited. In further planning and/or revision of this proposal, we ask that the following points be borne in mind:

1) The Eratosthenes seamount south of Cyprus may well have an intact Plio-Quaternary pelagic succession, with only minimal clastic input. Floyd McCoy, Hawaii Institute of Geophysics, is collating seismic and other data for this feature. If chosen for drilling sapropels, we urge penetration to basement to resolve the question of an oceanic versus continental origin of this important tectonic feature. Also, basal hydrothermal (Mn) deposits have been cored and reported by S. P. Varnavos (Patras, Greece), could be of interest to SGPP.

2) The sites drilled in the Mediterranean ridge could help document the vertical tectonic evolution of this important collisional/accretionary feature.

3) Other sites could be chosen to document a) the history of Aegean volcanism/arc development and b) uplift and erosion of Anatolia.

4) The proponents should consider combining the sapropels proposal with other tectonically oriented Mediterranean proposals--379A, 383A.

5) A. H. F. Robertson, Edinburgh, U.K. representative to TECP, and TECP liaison with SGPP, would be glad to assist the proponents in any way possible.

Ranking: 2, Immature

392. A mantle plume origin of the North Atlantic volcanic rifted margins....

This is a clean, compact, well-presented proposal. It is not yet mature, however. TECP suggests consideration of the following items to improve the proposal and to bring it to maturity:

1) Discuss in detail the reinterpretation of magnetic anomalies and structural interpretation along the continental margin;

2) Transverse seismic lines are needed to tie sites 3 and 4 to 1 and 2 in an integrated structural interpretation;

3) What is known about the conjugate margin (whether it is drillable or not) to fit the study into a larger context of models of VRM development?

4) What is chemistry and ages of the Thulean flood basalts?

5) Is hole LABS 2 needed? Should LABS 1 be deepened?

6) Is there a site where LABS 3 and 4 could be combined into one hole?

7) Is there any data that might suggest the composition of the possible peridotite ridge?

8) Is this the best place to try to correlate seaward-dipping reflectors with continental flood basalts?

Proposal ranking: 4 immature

393 Drilling the continent-ocean transition on the SE Greenland volcanic rifted margin...

The lack of seismic data in section B is a significant flaw in a proposal that intends to correlate the seaward-dipping reflectors with the continental flood basalts. Questions that need to be addressed are :

1) Why is this area better to study the SDRS-CFB correlation than the DPG high-priority transect?

2) How will the volcanic rocks be dated? Will the dating be precise enough to effect the intended correlation?

3) How will the drilled volcanic rocks be correlated with the CFB's?

4) What geochemical observations will be made?

5) What is the relation between the proposed drilling region and the conjugate margin; what is the nature of the latter?

TECP recommends that the proposal be sent to the NARM DPG for consideration in the context of the Volcanic Rifted Margin transect

Proposal ranking: 4 immature

394. Evolution of pre- and syn-volcanic extensional basins on passive volcanic continental margins

The tectonic/regional setting needs to be added. The correlation of volcanic unit 3 to the volcanic break-up sequence along the Hatton Bank margin (including SDR's) should be discussed and specifically demonstrated. TECP's view is that one hole should be sufficient to meet the major drilling objectives. The drilling objectives should be related better to the overall fundamental problems listed in the Introduction. TECP wishes to draw the proponents' attention to a rather similar proposal (311) and encourages contacts between the two groups holding data in the region.

Ranking: 4 immature

395. Post-breakup compressional tectonics on a passive volcanic continental margin

The case for this proposal is not well made. It is not clear from the proposal that the feature is of local or regional significance. It could be a flower structure related to a strike-slip fault of limited extent The proposal objectives should be placed in the broader view of possible compressional deformation in the North Atlantic as a whole. The information presented on the sedimentary cover is inadequate.

Ranking: 2 immature

396. Testing of the hot-spot model for the origin of volcanic passive continental margins

This is a preliminary proposal addressing two objectives: 1) testing the hot-spot origin of volcanic passive margins; and 2) broadening the geochemical database in order to enable modelling of melt sources and to clarify the contribution of lithospher composition and continental crust contamination in volcanic passive margin evolution. TECP feels that existing geochemical data missing from the proposal could make the case stronger. The proposal does not consider the possibility of multiple melt sources. The geochemical rationale must be developed more explicitly and convincingly. The site survey information is incomplete.

Ranking: 3 immature

S-1. Documentation of lithofacies and depositional cyclicity, Navy deep-sea fan, California borderland.

This proposal essentially falls outside the mandate of the Tectonics panel. TECP does have an interest in the record of eustatic changes in sea level, and in other possible tectonic implications of deep-sea fan deposition. These interests are only indirectly addressed by this proposal, however.

Ranking: 2 immature.

NORTH ATLANTIC RIFTED MARGIN DPG REVISITED

Hans-Christian Larsen renewed the discussion of the North Atlantic Rifted Margin DPG by outlining the evolution of thought in the past 2-4 years about rifted margins. During this time it has become clear that approximately 50% of the world's rifted margins are volcanic-rich in nature. This surprising new insight means that we must revise our perception of how continental margins form, and what it is that initiates a Wilson Cycle. The existing volcanic-rich margins are related to the breakup of the Pangea supercontinent. Geographic and temporal relations imply that they form as a result of development within the mantle of hot regions, 100 times larger than plumes (in other words, structures that are reminiscent of the 800-1000 km diameter "corona structures" recently recorded in the Magellan radar data from Venus). A possible cause may be the thermal blanketing effect of large supercontinents.

The formation and development of volcanic-rich rifted margins seems to be very rapid, within 1-5 million years, in contrast to the development of volcanic-poor rifted margins,which develop slowly but continuously over tens of millions of years. These latter can expose the mantle without volcanism, possibly by some form of asymmetric rifting (simple shear?). Sheeted dikes within continental rocks are one feature that signals the copious igneous activity that marks the development of volcanic-rich margins.

Considerable discussion took place about the significance of these new results and their possible implications for tectonic history of other areas. Robertson observed that the Permo-Triassic margins in the Mediterranean region, subsequently caught up in the Alpine orogeny, seem more reminiscent of volcanic than non-volcanic margins. The specific sequences include the Verrucano (bimodal volcanism and associated sediments) of the western Mediterranean and the "Diabase-chert" assemblages of Yugoslavia and Greece. Moores wondered about the Triassic-Jurassic silicic "Tobifera-Choiyoi-Chonaiki" volcanism of southern South America, documented, among others, by former TECP Chair

Dalziel and co-workers, and posed the question as to the extent to which seaward-dipping reflectors are silicic in nature.

The ODP North Atlantic drilling has an unparalleled opportunity to investigate the contrast between volcanic-rich and volcanic-poor rifted margins. To do so, they propose to concentrate on two transects--a volcanic-rich margin transect eastward from southeast Greenland, and a volcanic-poor transect eastward from Newfoundland. Larsen expressed the DPG's hope that the two transects could be considered as a package, rather than as two competing projects. TECP endorsed this view, as reflected in the Global Rankings, outlined below.

GLOBAL RANKINGS

STATUS OF TECTONIC THEMES

Moores opened consideration of global assessment by outlining the major themes of concern to the Tectonics Panel, and calling for volunteers to assess the status of these tectonic themes in the context of existing proposals and recent drilling results Exciting aspects of oceanic drilling research include 1) the understanding active processes and 2) providing an actualistic anchor from which to develop a historical perspective about the evolution of the Earth in times prior to the preservation of oceanic crust and its well-known magnetic anomaly "road map" of plate motions. The discussants evaluated the status of their particular thematic area:

THEME	DISCUSSANT(S)
1. Rifted margins: volcanic-rich volcanic-poor	Hans-Christian Larsen
2. Sheared (translational) margins	Alastair Robertson
3. Convergent margins	Jan Behrmann
4. Divergent oceanic plate margins	Jeff Karson
5. Plateaus, microcontinents, aseismic ridges, anomalous basins (Caribbean, Scotia Sea)	Alain Mauffret
6. Driving forces, including stress, intraplate deformation	Mark Zoback
7. Collisional margins	Phil Symonds
8. Plate History, sea level changes and origin of magnetic anomalies	Tanya Atwater, Steve Cande

RIFTED MARGINS

Hans-Christian Larsen enlarged upon his earlier NARM DPG report and described how rifted margins have been the subject of many ODP proposals. The principal projects put forth are:

1. The North Atlantic transects embodied in the NARM DPG report
2. Basins marginal to volcanic-rich margins (proposals 310, 394)
3. Southeast Newfoundland (proposal 363)
4. Labrador Sea
5. Old Jurassic Atlantic margins (Proposals 326, 344, 74, 85)
6. South Atlantic margins (Proposals 381, 327)
7. Young rifted margins:
   Red Sea/Gulf of Aden

000352

Bransfield Strait-Antarctic margin
Tyrrhenian Sea
(Proposals 351, 353, 140, 21, 219, 134, 119)

8. Other older margins:
    Antarctica
    Australia
    SE Africa
9. Western Woodlark Basin

SHEARED (TRANSLATIONAL) MARGINS

Alastair Robertson pointed out that these represent the third great category of plate boundaries. They have received relatively little attention in the past, but the rapid increase of information on the other boundary types has led to new attention devoted to these types. There are several categories:

1. Continental margin translational openings, e.g. equatorial Africa. One proposal is extant, and much recent work has gone into its revision. Issues here include crustal structure, subsidence history, and basement highs.
2. Oceanic fracture zones. Most proposals, such as those for the Kane Fracture zone and the Central Indian Ocean, have chiefly addressed igneous processes and have mostly ignored tectonic questions. Tectonic problems include the mechanics of uplift of mafic-ultramafic highs, such as the Vema fracture zone, and the swings into the transform of the spreading fabric, which has been ascribed to changes in regional stress pattern.
3. Transform continental margins--e.g. the southern California Borderlands. Existing proposals are entirely stratigraphic. Opportunity exists here for onland-offshore tieups. Many examples exist in places such as the western Indian Ocean, as well as in mountain belts (e.g. Alpine sector of the Gondwana-Laurasia opening).
4. Trench-trench transform faults. Examples include the South Sandwich, southern Caribbean, and western Aleutian margins. We know little about these features.

Few if any top-rated tectonic proposals exist in this theme. The most hopeful is the revised Gulf of Guinea proposal whcih should come to us soon. <u>We should issue an RFP in this area.</u>

CONVERGENT MARGINS

Jan Behrmann outlined the status of this theme. Many proposals and drilling legs have addressed issues related to this theme. Outstanding issues/proposals are:

1. Chile triple junction will be partly done in 1992. Issues that will remain include the longitudinal (time-transgressive) evolution and the question of subduction erosion.
2. Cascadia margin will be done in part in 1992. It is unclear what will be left over.
3. Barbados. The current proposal is too large. TECP suggests re-division into three aspects:
    a. Unanswered questions from Leg 110, principally instrument-accented fluid flow measurements.
    b. Southern Barbados, the Westbrook sector, focusing on questions of episodicity of accretion and growth kinetics of wedge.
    c. Forearc basin development in the northern sector.

In revision of the Barbados proposal(s), particular attention should be paid to focusing on questions of global significance, rather than area-specific problems.
4. Mediterranean Ridge (proposal 330 Add).
5. Kurile trench (old proposal of 1987 vintage)
6. Global issues include tectonic erosion (e.g.Chile, Puerto Rico, Mexico, Peru, Japan) and hydrogeology (e.g.Barbados, Cascadia II, other?). (Moores observed that resolving the issue of tectonic erosion will require combined onland/marine studies.).
7. Oblique convergent margins (e.g inner Caribbean margins) were the subject of a recent workshop in Jamaica. No proposal has been forthcoming. We should issue an RFP in this

DIVERGENT OCEANIC PLATE MARGINS

Jeff Karson observed that tectonic themes are largely missing from the approximately 20 proposals for drilling at mid-oceanic ridges, and the ubiquitous tectonic questions have simply been ignored.

Slow spreading ridges have major fault escarpments parallel to the ridge, which commonly are simply viewed as "giant road cuts" for lithospheric sampling, but which are instead an integral and poorly-understood tectonic component of lithospheric development. The "surprises" encountered in many holes in slow-spreading ridges point to the lack of structural and tectonic control on these sites, and to the lack of understanding of the development or even the nature of oceanic lithosphere. Most median valleys that have been surveyed in detail are asymmetrical, rather like conjugate continental margins. Brian Tucholke observed that hole 735B contained very exciting structural information, and a lot more could be done in this regard on this and other cores. In response to a panelist's query, Karson observed that a good target for drilling would be major reflectors in the oceanic crust. He suggested a two-part approach to attack this problem: 1) someone should be commissioned to collate the structural information in older DSDP/IPOD/ODP cores; and 2) we should issue an RFP for conjugate drilling across the median valley.

Fast-spreading ridges are more problematic because the structures are not so well-exposed obvious. Nevertheless there is need for more tectonic/structural input here, as well. The tectonic information from hole 504B is understudied. Hess Deep constitutes a unique opportunity to extract tectonic information about the development of fast-spreading East Pacific Rise crust, but the existing drilling proposals are essentially petrologic in nature. Tectonic/structural considerations were not a part of the East Pacific Rise DPG. A related question is the nature of amagmatic spreading such as that which formed Hess Deep at the western end of the Galapagos propagator.

Back-arc/marginal basins have been the subject of a number of proposals, most of which have tectonic objectives. Examples mentioned included the Tyrrhenian and Aegean Seas and Bransfield Strait. These examples provide good opportunities for land/sea tieup. All proposals are good, but the Aegean is immature.

Ophiolite analogues would be helped by any oceanic crustal drilling. Questions of the initiation of subduction and ophiolite emplacement have not been addressed (except for the minor consideration of the Taitao Ridge in the Chile Triple Junction proposal). A further issue is the high temperature metamorphic soles of ophiolite complexes--where are they forming today. Proposals to drill the Aoba basin and the Woodlark basin bear on the ophiolite analogue. It would be nice to see a proposal address the initiation of subduction in the Macquarie Island region.

000354

During discussion, several veteran panel members expressed considerable frustration about TECP's repeated revisiting this topic without coming up with concrete objectives. Perhaps what is needed is a different approach. Instead of trying to piggyback tectonic objectives on existing oceanic spreading center proposals, one should develop a tectonic proposal from scratch, in which drilling objectives are only part of a comprehensive geologica/geophysical/drilling project addressing the question of the tectonics of development and/or preservation of oceanic lithosphere.

PLATEAUS, MICROCONTINENTS, ASEISMIC RIDGES, ANOMALOUS BASINS (CARIBBEAN, SCOTIA SEA)

Alain Mauffret summarized a few principal regions of this category--Kerguelen, Ontong Java plateaus, the Pacific volcanic province, Agulhas plateau, Caribbean, etc. Some of these have been drilled, and some are the subject of proposals of varying status. The origin of the Caribbean, for example, is related to the question of the origin of anomalous volcanic provinces. Drilling in these regions for tectonic objectives is difficult and requires careful geophysical constraint and possibly close coordination with on-land studies. Phil Symonds suggested an RFP for a combined land-sea study of the Caribbean region aimed at formulating questions that could be answered by drilling.

DRIVING FORCES, INCLUDING STRESS, INTRAPLATE DEFORMATION

Mark Zoback mentioned that the borehole televiewer for stress determination is a standard down-hole logging tool for rotary core bit holes. For this aspect we need only to encourage its continued routine use. The borehole televiewer is not yet available for the smaller diamond coring system holes. Can we encourage its development?

The intraplate deformation in the NE Indian Ocean (southeast of Sri Lanka) is possibly a nascent subduction zone and is a prime candidate for possible study.

COLLISIONAL MARGINS

Phil Symonds summarized the status of this subject. There are nine proposals since 1987 on this theme, principally in the Mediterranean and in the Australia-Indonesia-New Guinea collision zone. The complex nature of these systems makes it difficult to formulate well-focused drilling proposals especially with the present state of knowledge. Collisional systems, however, offer an opportunity to meld ODP research with land geology. There are many significant questions to be answered, such as the nature of extension in collisional systems. For example, the continental crust of the Alboran Sea appears to have thinned from 40 to 14 km in a few million years. The Aegean Sea has a similar history. Foreland basins represent relatively neglected regions. They are of economic importance and are a key element in the interpretation of collisional mountain systems. The east Indonesian-Papua-New Guinea foreland basin is an example, as well as being an important area in which to study terrane accretion processes. Collisional accretionary prisms are present in the Mediterranean and in eastern Indonesia--these features clearly are related to active margin accretionary prisms.

PLATE HISTORY, SEA LEVEL CHANGES,

Tanya Atwater noted that the tectonic aspects of these subjects generally are not worth a whole leg. She and Steve Cande volunteered as "Watchdogs" to be alert for possible addition of tectonically oriented drilling in this regard to other proposals. There are several subjects that command attention:

1. Basement ages are not known in some places. This lack of knowledge could be addressed by selective deepening of holes drilled for other purposes.

2. The Cretaceous quiet zone needs more work. There have been a few suggestions of "wiggles" in the magnetic field during this zone, but we need more information about the nature of the magnetic record in the oceans to correlate with land studies.

3. Hot spot tracks and absolute plate motions are not well known in the Pacific and in the Mesozoic everywhere.

4. There are several "local" or regional problems that we tend to lose sight of, such as the Caribbean and the Indian Ocean soft plate boundary. There may be other soft plate boundaries, as well.

5. We need to know the time of initiation of the first oceanic crust in passive margins, in order to properly understand the nature of the continental margin magnetic features.

ORIGIN OF MAGNETIC ANOMALIES

Steve Cande mentioned that the question remains as to the location of the magnetic anomalies. There are a number of contradictory observations:

1. There is considerable extensional rotation in slow-spreading oceanic crust, which doesn't always seem to be reflected in some magnetic anomalies.

2. The magnetization is low in layer 2, suggesting that the source is deeper.

3. The magnetic anomalies are skewed in some cases more that would be predicted from structural information, and less so in others. For example, the M0-M10 sequence in the central Atlantic displays perfect unskewed magnetic profiles, whereas Anomaly 34 is highly skewed. The slow spreading rate would seem to be compatible with fault-block rotations and skewed anomalies. The M0 anomaly has been drilled, so it would be interesting to drill Anomaly 34 for comparison purposes. This might be a fruitful subject for an RFP, perhaps for the transect south of the Kane Fracture zone.

WATCHDOGS

TECP watchdogs have the following responsibilities:

1. To keep track of their individual themes and to have the most up-to-date information necessary to evaluate and rank proposals or themes within the system.

2. Monitor proposals on a given theme from birth through adolescence to maturity. Make sure that detailed information gets back to proponents on what is necessary for greater applicability to TECP themes. Keep TECP infomed of status of proposals within their individual theme.

By consensus of the panel, the following watchdogs were appointed for the indicated areas:

1. Alastair Robertson--Transform Margins

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2. Steve Cande, Tanya Atwater--Plate history, sea level change, magnetic questions

3. Dale Sawyer--Young rifted margins

4. Hans-Christian Larsen-Old rifted margins

5. Jeff Karson--Mid-ocean ridges

6. Yujiro Ogawa--Marginal basins

7. Casey Moore/Jan Behrmann--Convergent margins (normal subduction)

8. Phil Symonds--Convergent margins (collisional)

9. Mark Zoback--Stress and mid-plate deformation

GLOBAL RANKINGS

Global rankings were made by listing 25 outstanding thematic issues and/or proposals on the screen and each person ranking 20 in order. Proponents agreed not to vote on their own proposals and to indicate on their ballot that they had a conflict. Scores were tallied, and averages computed by dividing total scores by the number voting minus the number of conflicts (12 or 11 in every case).

Rankings were further qualified by indicating which ones were achievable in the next 4 years, according to TECP consensus. Explanatory discussions follow the rankings.

TECP GLOBAL RANKINGS, MARCH 1991

RANKING	PROJECT/PROPOSAL (Proposal #'s in parentheses)	AV. SCORE	ACHIEVABLE IN NEXT FOUR YEARS
1.	North Atlantic DPG 4/7 legs	13.25	YES
2	Mediterranean collison zone 1/2 legs (323A, 330A, 379A, 383A)	10.92	YES
3.	Chile Triple Junction leg 2 (362-Rev2--pre and post collisional zones)	8.91	YES
4.	Equatorial Atlantic margin (346/A Rev.)	8.83	YES
5.	Hess Deep-2nd leg (A tectonic leg, as yet unsubmitted, not the one proposed in the East Pacific Prospectus)	8.08	
6.	Caribbean crust (343A, 384ARev)	6.33	
7.	Western Woodlark Basin (265D, Add)	5.83	
8.	Barbados next leg (378A Rev)	5.18	YES
9.	Galicia S reflector (334 Rev)	4.75	YES
10.	SE Newfoundland ridge (363)	4.67	YES

11.tie {	Slow offset drilling (A not-yet-proposed leg emphasizing the drilling component of a comprehensive study of the tectonics of formation of offset drilling sites)	4.09	
12. {	N. Australian collisional margin (340D)	4.09	
13.	Red Sea, Gulf of Aden (e.g. 119, 140, 219)	4.0	
14.	Cascadia (second leg of DPG proposal)	3.82	YES
15.	Tyrrhenian Sea (e.g. 12A)	3.58	
16.	Labrador Sea (366A)	3.33	YES
17.	Cayman Trough (333A)	3.0	YES
18.	Stress at hole 505 (373E)	2.33	YES
19.	South Atlantic margins (327, 381)	2.08	
20.	Old (south) Australia margin (e.g. 65B)	2.0	

Comments on Rankings:

1. TECP has confidence in the NARM DPG, and is willing to trust their judgment as to which of the proposed legs should have priority.

2. This ranking is based on increased TECP interest in the concept of collisional processes. Two proposals (Alboran Sea and Mediterranean ridge) are well enough developed to be brought to maturity in time to be included in the next four years. The proponents should be encouraged to come up with the needed new data and analysis in time to meet the schedule.

3. New site survey information has been accomplished to sharpen focus of second leg. Ranking is consistent with TECP's previous global ranking.

4. New site surveys have been completed in the Gulf of Guinea. New submersible data will be available soon. The proponents should be encouraged to revise proposal in time for the next four years' program.

5. TECP is interested in a tectonically focused leg, perhaps as a substitute or complement for a lithospheric focus. New site survey information is crucial. It is unlikely that adequate survey information will be available in time for the next 4 years.

6. In TECP's view the Caribbean presents exciting problems related to the origin of oceanic plateaus, the possible emplacement of an exotic plate from the Pacific. We note, however, the deficiencies of existing proposals, and we do not believe that any will achieve maturity within the next several years.

Rank 7 and below. Proposals achievable in four years are indicated. The other proposals in this category are not yet mature from a tectonic perspective. The items are rated chiefly as topics, rather than as ratings on individual proposals.

PROPOSAL "SHELF LIFE"

In its global rankings, TECP has wrestled with the dilemma of which proposals are still active. **Accordingly, TECP recommends that proposals not renewed three (3) years after review shall be considered no longer active.**

NEXT MEETING

The next meeting will be in Cyprus, tentatively scheduled for October 9-11, after a 3-day field trip to the Troodos complex to be offered by PCOM member John Malpas, TECP Chair Eldridge Moores, and TECP UK representative Alastair Robertson.

APPENDIX 1

SUGGESTED CHECKLIST OF FEATURES OF TECTONIC SIGNIFICANCE FOR ODP PROPOSALS, SITE SURVEYS, AND CORE DESCRIPTIONS

The Tectonics Panel of the Ocean Drilling Project (TECP) has been concerned for some time with the breadth and universality of tectonics in questions of ODP drilling. It has spent considerable effort in the review process trying to suggest ways in which proponents could enhance the tectonic value of (and TECP's interest in) their proposals. In this process it has found that many proposals lack the items detailed below. TECP offers this checklist of features to be expected in proposals and site surveys, as well as in cores, as a means of saving time as the proposal matures, and of increasing the scope of the scientific results of each drilling site.

CHECK LIST FOR PROPOSALS and SITE SURVEYS

1. Does the proposal narrative recognize and adequately address the tectonic significance of the proposed drilling?

2. Does the proposal team include appropriate experts in tectonics?

3. Is the structural and tectonic setting of each proposed hole clearly outlined? Items include:

- --Geophysical data
  - --Seismic refraction data?
  - --Seismic reflection data
    - --multichannel?
    - --migrated?
- --Structural information
  - --fault scarps--attitudes, fault plane features, etc?
  - --igneous rocks--types, distribution, attitudes
  - --sediments--types, distribution, attitudes.
  - --breccias--tectonic or sedimentary
  - --projection of surface information to depth?

--predicted level of intersection of surface features in hole?
--accurate scaled cross-sections (no vertical exaggeration)?
--balanced?
--drill sites located on cross-sections?
--objectives of site discussed in context of inferred structure at depth on balanced cross-sections
--seismicity?
--maps
--focal mechanisms

4. Is the tectonic setting adequately incorporated into the objectives of the proposed drilling site?

--Offset sites
--are the local variations of structure and lithology of single site clearly documented?
--variations in structure and lithology between sites clearly documented?
--tectonic rationale for use of proposed sites in composite clearly documented?
--tectonic questions to be answered by site clearly formulated and adequate?

HOLES AND CORES

1. Are the following feature ---predicted?---observed?
--breccias:---tectonic? ---sedimentary?
--matrix vs clast supported??
--clast composition
--clast shape, surface features (striations, etc)?
--non-horizontal dips on sediments or lavas?
--non-vertical dips on dikes
--faults?
--dimensions of zone?
--recovery?
--slickenlines? useful for stress determination?
--juxtaposition of different magnetic polarity? --chemistry?--petrography?
--abrupt changes in magnetic inclination?
--ductile shear fabrics?
--porphyrblasts?

--S/C fabrics?
--tension gashes?
--offset markers?
--syntaxial or antitaxial growths?

--metamorphic features?
--duplicated or missing metamorphic zonation?
--mineralized faults or fractures?
--same or different from host rocks away from faults?
--straight or curved?
--if curved, S- or Z-shaped?
--stress field inferrable? inferred?
--vein mineralogy? comparison with host rocks?
--fluid inclusion microanalysis

--igneous contacts

--any independent means of determining paleo-horizontal and azimuth constraints in addition to magnetic vectors?

2.--Does the proposed shipboard scientific staff include the requisite expertise to identify and interpret the predicted structural features in cores?

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NORTH CAROLINA
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DEPARTMENT OF GEOLOGY
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TELEPHONE (919) 684-5847

RECEIVED
APR 0 8 1991
Ans'd............

April 4, 1991

Dr. James A. Austin
Institute for Geophysics
University of Texas at Austin
8701
Mopac Blvd.
Austin, TX 78759-8345

Dear Jamie,

The enclosed document is meant to be included with the TECP minutes and report sent to you separately by Eldridge Moores.

Cheers!

Jeffrey Karson

ODP TECP Interest in Proposed Drilling at Hess Deep

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APR 0 8 1991
Ans'd............

Tectonic Studies at Hess Deep

During the March 1991 meeting of TECP at Davis, CA, the panel discussed scientific problems to be addressed by drilling near Hess Deep in scheduled and future ODP programs. The panel is very interested in this area, but would like to see a much broader approach to drilling than presently expressed in available proposals. TECP members expressed interest in two general types of information: structures related to fast seafloor spreading and structures related to mechanical extension of oceanic lithosphere away from a spreading center.

The definition of the internal composition of oceanic crust created at fast-spreading ridges is a longstanding goal of LITHP. However, deformation structures produced during fast spreading are also of interest. Evidence of substantial faulting and plastic deformation is well documented in many ophiolites and also in outcrops and samples from fast-spread (135 mm/yr) East Pacific Rise crust exposed near Hess Deep. *Nautile* and *Alvin* submersible studies have shown that upper crustal structures can be studied directly in major escarpments in this area,. However, middle and deep crustal units appear to be rather poorly exposed at the surface but are anticipated at relatively shallow depths (< 1 km ?). TECP would like to see proposals include studies of deformation fabrics in both crustal and mantle lithologies that will help elucidate the kinematics and dynamics of deformation at these structural levels. These objectives can easily be appended to existing proposals and will be in accord with LITHP thematic interests.

Mechanical rifting of oceanic lithosphere away from an established spreading axis occurs at Hess Deep, but also at other propagating rift tips ranging in scale from those at overlapping spreading centers, to microplate boundaries to major propagating systems. Understanding the geometry and kinematics of this type of rifting is not considered in the present drilling objectives at Hess Deep. While there are obvious applications to the study of lithospheric extension in general, several specific areas of interest appear to be available for study in this region. These include the development of low-angle (detachment) faults, flexural response to footwall unloading in a region of large extension, vertical partitioning of strain during extension, serpentinite diapirism, rift propagation kinematics, and stress distribution near a propagating rift tip. Proposed drilling is not designed to address these questions and TECP would like to see additional proposals in these areas. These types of studies cannot be accomplished with a single deep hole in the rift floor. Drilling transects and carefully sited holes in various parts of the rift valley would be required. Some of these types of objectives could be accomplished as part of an offset drilling program designed to ultimately recover a composite section through the entire thickness of the crust.

Concerns Regarding Proposed Drilling

Despite the initial enthusiasm of LITHP and PCOM for drilling a deep hole in Hess Deep that might penetrate deep crustal rocks and perhaps even the geological expression of the Moho discontinuity, TECP is very concerned about the lack of a sufficient data base with which to adequately plan a drilling program. In addition, there has been an inadequate consideration of the available data. In particular, there is concern that drilling of mainly lithologic targets is presently based on highly suspect preliminary geological cross sections of the rift structure. The cross sections used in the present proposal of Gillis and others (ODP Proposals 375/D and 387/E Rev) and published by Francheteau and others (1990) have problems both with basic assumptions regarding the pre-rift crustal structure and with the geometry of.tectonic features in the sections. Both of these factors have a major effect on the inferred geologic structure of the Hess Deep Rift and on strategies for drilling to any particular structural level of the crust including the potential for offset drilling.

The seismic thickness of the crust in the area is not well constrained at present. In the proposed cross sections the thickness is taken as only 4 km, substantially less than the more typical 5-7 km found in other parts of the Pacific Ocean crust. This figure is apparently based on the results of multichannel seismic reflection data (Zonenshain and others, 1980) for which there is no velocity control. Reflections at about 1.3 s are taken as the Moho, however, this is at best the reflection Moho and need not correspond to the depth of the velocity increase to >8.0 km that would correspond to anhydrous olivine-rich rocks of the mantle. The presence of a substantial thickness of ultramafic cumulates cannot be ruled out. In fact, samples interpreted as cumulate ultramafics were recovered in the Hess Deep Rift with *Nautile*. Thus, the depth to a family of interesting reflectors may have occurred at 4 km depth in the pre-rift crustal structure but, the depth to the cumulate/residual mantle contact ("petrologic Moho") may be substantially deeper.

Geometric problems with the proposed cross sections of the Hess Deep Rift are evident from elementary line-length balancing or cut-and-paste reconstructions (figures 1 and 2). Making simple assumptions concerning area conservation and faulting in the crustal units, neither of the proposed sections cannot be restored to a continuous layered structure and therefore are unlikely candidates for the present geologic structure of the rift valley. From the presently known surface geology of the rift a family of balanced (restorable) cross sections can be constructed. Many possibilities arise depending upon the details of fault geometry in particular. Because no unique section can be drawn at this time, the roles of several major types of features are unclear. These include low-angle normal faults, high-angle normal faults, broad serpentinite uplifts, and flexural uplifts. The geometry of these structures dictates the distribution of rock types across the rift and at depth. Thus, a detailed knowledge of the structure of the Hess Deep Rift in cross section is required if any drill hole is to be placed in the proper geological context. This is perhaps most critical for any attempt at the construction of a composite section from a series of offset drill holes. This is illustrated by the very different offset drilling strategies that might be proposed for the different cross sections shown in Figure 1.

With these considerations in mind, it should be noted that drilling on the Intra-Rift Ridge of Hess Deep should have a high likelihood of penetrating layered cumulate rocks that are known to crop out there. It is less clear if major low-angle detachment faults will cut-out part of the pre-rift vertical sequence at depth. Restorable cross sections of rifted crust with pre-rift thickness of 6 km can be constructed to place the (paleo-) Moho at depths of 1-2 km beneath the top of the Intra-Rift Ridge, possibly within the range of present drilling techniques (?). Although it is difficult to account for the present elevation of this ridge, many structural models of the rift generally include very deep crustal rocks in this location.

Recommendations

Drill site selection should be based on restorable, cross sections with no vertical exaggeration.constructed on the basis of the most complete geological and geophysical data available. In the case of Hess Deep, site survey work will almost certainly have to be done after initial drilling has begun.. In order to provide additional constraints for cross sections in the area we suggest the following types of site survey work.

1. **Both regional and local, high-resolution seismic studies that include seismic reflection and refraction.**
2. **Collection and analysis of gravity data across the rift valley.**
3. **Near-bottom sampling.**
4. **Collection of detailed structural data including the strike and dip of geological contacts and paleomagnetic studies.**
5. **Collection and analysis of earthquake seismic data.**

In addition, TECP would like to see additional proposals for studies that could be carried out in the vicinity of Hess Deep either in conjunction with or separate from the existing proposal and proposals for offset drilling.

1. **Investigations of deformation structures in the lower crust and upper mantle associated with fast seafloor spreading**
2. **Investigations of extensional deformation associated with the opening of Hess Deep Rift.**

References

Francheteau, J., Armijo, R., Cheminee, J.L., Hekinian, R., Lonsdale, P. and Blum, N., 1990, 1 Ma East Pacific Rise oceanic crust and upper most mantle exposed by rifting in Hess Deep (equatorial Pacific Ocean): Earth and Planetary Science Letters, v. 101, p. 281-295.

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Zonenshain, L., Kogan, L.I., Sovostin, L.A., Golmstock, A.J. and Gorodnitskii, A.M., 1980, Tectonics, crustal structure and evolution of the Galapagos Triple Junction: Marine Geology, v. 37, p. 209-230.

Figure Captions

Figure 1. Cross sections of the Hess Deep Rift structure. Sections (a) and (b) from Francheteau and others (1990) are not restorable to a continuous layered crustal sequence by dip-slip displacements on faults striking at right angles to the section planes.. Section (c) is a nearly restorable section based on a modification of (b). Section (d) is a restorable section using only planar detachement and high-angle faults. See figure 2 for restored sections.

Figure 2. Restored cross sections of the Hess Deep Rift (Karson and others, unpublished data). (a)-(d) correspond to the sections in Figure 1. Note that large gaps (black) and overlaps (stippled) are present in sections (a) and (b), that is, they are not balanced and are therefore unlikely candidates for the geologic structure of this area. Many other possible solutions exist.

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5 March, 1991

Dr. James Austin
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Dear Jamie,

The Atolls and Guyots Detailed Planning Group met in Ann Arbor on the 27 and 28 of February. During that meeting we reviewed the science proposed in ODP proposals 202-Rev and 203-Rev and constructed two drilling legs that fulfill the PCOM charge and meet the several objectives of the two proposals. The meeting went very smoothly and the results were achieved and are presented to you, enclosed, with no dissent.

I would like to raise a point for PCOM consideration regarding attendance at DPG meetings. The week before we met I was a bit dismayed to find that our little meeting of 6 people had grown to about 15. We are all aware that it is much easier to accomplish a focussed objective of the DPG sort with a few people who are aware of all the pertinent information. The larger the group the more readily things are likely to become sidetracked, get out of hand, etc. Some of the guests/visitors, because of their own experience or the groups they represented, made truly valuable contributions to the discussions. All the others provided thoughtful input to the discussion, but did not effect the outcome of the meeting much. These were all well-known and capable scientists, just not too familiar with atolls or guyots.

My concern regarding what I consider to be this problem of excessive attendance was heightened when I inquired whether Glenn Foss could come to the meeting. He had done all the calculations for the down-hole operational times. Down-hole operations were at the heart of our discussions, and guyot drilling will present technical problems. I was informed there was no travel money for Glenn to come to our meeting, and yet the various coffers of ODP found money for about half a dozen non-essential people. May I suggest that PCOM not allow every panel and partner nation to send a liaison to DPG meetings (unless perhaps the person designated has particularly useful experience in the DPG topic). This means that PCOM will have to trust the DPG and its chair to accomplish their charge without "oversight". Further, I recommend that there be a jointly endowed travel fund so that a DPG chair can ask for a particular sort of representation that they may feel important. Naturally such a request should be approved by the PCOM chair, but that should be something which could be done in a rather short telephone call. Thus I urge PCOM to: a) limit attendance at DPGs, b) save ODP travel money, and c) provide a means to enable the attendance of persons critical to the discussions at hand.

Sincerely yours,

Dave

David K. Rea
Professor and Chair,
Atolls and Guyots DPG

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ATOLLS AND GUYOTS DETAILED PLANNING GROUP

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Ans'd..........

"The DPG is charged to construct a two-leg drilling plan that includes the priority 1 and 2 targets of proposal 203-Rev (approximately 38.4 days) and additional targets of proposals 203-Rev and 202-Rev, selected so as to create a maximized, balanced, scientific return from the range of objectives of these proposals. The DPG will also take into account thematic panel priorities."

Minutes:

The Atolls and Guyots Detailed Planning Group met at the Department of Geological Sciences, University of Michigan, Ann Arbor, on February 27 and 28, 1991. Attending the meeting (and representing) were: D. Aissaoui (France), T. Atwater (TECP), F. Duennebier (A+G DPG), R. Flood (SGPP), X. Golovchenko (Borehole Group), R. Halley (A+G DPG), M. McNutt (A+G DPG), A. Palmer-Julson (ODP), I. Premoli Silva (ESF), D. Rea (A+G DPG, Chair), H. Staudigel (A+G DPG), K. Tamaki (Japan), J. Watkins (PCOM), and E. Winterer (A+G DPG). C. Brenner (ODP Data Bank) and T. Brocher (LITHP) were unable to attend. Visitors from the Michigan geology department included T. Quinn and B. Opdyke (both post-docs) and S. Hovan (graduate student).

The meeting opened with a welcome given by Henry Pollack, Chair of the Department of Geological Sciences. Rea followed with a presentation summarizing the drilling times, calculated by ODP, and logging times, calculated by the Borehole Group, for each of the sites in proposals 202E and 203E. Two straw-man legs, A and B, based upon these operational times were presented as points of discussion. For much of the morning the meeting centered on the science and objectives of the proposals in general and the sites in particular. Winterer presented the material pertinent to proposal 203E and Duennebier presented the material pertinent to proposal 202E. We learned the new names assigned to the guyots by the Republic of the Marshall Islands:

Sylvania = Wodejebato
Harrie = Limalok
Guyot of site Pel-3 = LoEn

These names are important as we need to request permission from the Marshall Islanders to drill in their waters.

The most recent guyot drilling was at site 831 on Bouganville Guyot, just west of the New Hebrides trench. Quinn, a sedimentologist on that leg, presented the results of that effort. Bouganville was drilled at a lagoonal (roughly guyot-center) location. The drill penetrated approximately 750 meters of middle to late Cenozoic reef rock with recovery rates of about 5%. This report, and the ever-present and long standing recovery question generated a discussion of where to drill on a guyot to enhance the amount of material recovered. The planning group (the several with experience in such matters) was unanimously of the opinion that the best recovery would be found in the backreef region, just on the lagoon side of the main reef structure. Accordingly we have positioned the Atolls and Guyots drillsites either in this backreef setting or on the marginal reef itself. Sites where the main objective is the pelagic cap are located more toward the guyot centers.

Following lunch, the discussion turned to the several basement objectives, a discussion lead by Staudigel. The three main objectives are to obtain/define the age of the edifices, their paleolatitude, and their geochemistry in regards to broad Southern Hemisphere geochemical anomalies (DUPAL, SOPITA). There are good reasons to drill deeply (ie: 300 to 400 m) into one edifice per leg, rather than drilling four or five intermediate basement depth holes. These include obtaining a geochemical and isotopic evolution of the magmas over several to many flows, and having enough inclination data to average out secular variation in the paleolatitude determinations. The DPG endorses the use of the new Japanese borehole 3-component magnetometer, to be ready next spring, in all basement sites as appropriate. This magnetometer is designed to be compatible with the Schlumberger tool strings and can be run in conjunction with other logs.

At the conclusion of the discussions of the scientific objectives, the panel spent the remaining time of the first day choosing the priority sites under the guidelines of the PCOM charge to the DPG. Of all the sites proposed only Majuro-1 fell out of consideration because it did not lie downslope from any of the guyot sites, and therefore would not provide a reliable distal record for any other Atolls and Guyots drillsites. Site 462 already contains similar information as would be encountered at Majuro-1. We surprised ourselves by ending the first day in complete agreement as to drillsite priorities.

The morning of the second day was spent reviewing the proposed operations at each of the sites and determining the time required to complete the several tasks. In this activity the information provided by Glenn Foss of ODP and Xenia Golovchenko of the Borehole Group was invaluable. Sailing times were calculated using a great circle navigation program and assuming a ship speed of 10 knots. After a thorough examination of the data and drilling times at each of the proposed sites, the panel selected a final list and agreed upon recommendations for the two Atoll and Guyot drilling legs. Leg A goes from Honolulu and conducts operations at Allison Guyot, "Huevo" Guyot (for which the name "Schlanger Guyot" has been formally submitted to the Board of Geographic Names), and the deep apron site Sylvania-3. This leg has 42.8 on-site days and 12.5 steaming days for a total of 55.3 days. Leg B goes from Majuro to Tokyo and conducts operations at Harrie (Limalok), Pel-3 (LoEn), Sylvania (Wodejebato), MIT and Seiko (a substitute for Charlie Johnson which has several non-typical geophysical signatures, and was considered to be less representative of the Japanese Seamounts than was Seiko) guyots. This leg has 45.1 on-site days and 11.9 steaming days. All this information is in the attached tables.

The ability to use both Majuro and Tokyo as ports is critical to the scientific success of both Atoll and Guyot legs (also to the following North Pacific leg). Use of Guam as the intermediate port instead of Majuro would require deletion of entire drillsites from each leg: Allison Guyot from Leg A and anything below the pelagic cap from Pel-3 and possibly the entire pelagic cap site Syl-2A from Leg B (these priorities also represent unanimous agreement of the DPG).

The Atolls and Guyots Detailed Planning Group adjourned in the early afternoon of February 28.

ATOLLS AND GUYOTS - DRILLSITES AND TIMES

PROPOSAL 203E

Drillsite	Lat(N)	Lon(E)	Drilling	Logging	Total Days
Allison-A	18°27'	179°32'	4.8	1.2	6.0
Huevo-A	21°19'	174°18'	14.7*	2.5	17.2
Huevo-B	21°22'	174°18'	3.5	1.0	4.5
MIT-1(E)	27°18'	151°53'	12.0*	1.2	13.2
Seiko-1	34°15'	144°15'	2.6	0.9	3.5
Seiko-2	34°15'	144°15'	2.1	0.9	3.0

PROPOSAL 202E

Drillsite	Lat(N)	Lon(E)	Drilling	Logging	Total Days
Sylvania-1	11°58'	164°57'	6.5	1.2	7.7
Sylvania-2A	11°54'	164°56'	1.6+	0.9	2.5
Sylvania-3	11°00'	164°45'	11.7	3.4	15.1
Pel-3	10°07'	162°48'	5.7	1.2	6.9
Harrie-1	5°29'	172°20'	4.6	1.2	5.8
Harrie-2	5°33'	172°21'	1.6+	0.9	2.5

*includes significant basement penetration   +pelagic cap only

ATOLLS AND GUYOTS DETAILED PLANNING GROUP

RECOMMENDATION FOR A+G LEG A

Activity	Steaming days	On-site days	Total days
Honolulu to Allison-A	5.0		5.0
Allison-A		6.0	11.0
Allison to Huevo	1.5		12.5
Huevo-A		17.2	
Huevo-B		4.5	34.2
Huevo to Sylvania-3	3.5		37.7
Syl-3		15.1	52.8
Sylvania to Majuro	2.5		55.3

Total on-site days = 42.8
Total steaming days = 12.5

Assumptions: 1. Ports are Honolulu to Majuro.
2. Steaming times are for great circles at 10 kts.

ATOLLS AND GUYOTS DETAILED PLANNING GROUP

RECOMMENDATION FOR A+G LEG B

Activity	Steaming days	On-site days	Total days
Majuro to Limalok	0.5		0.5
Harrie-1		5.8	
Harrie-2		2.5	8.8
Limalok to LoEn	2.6		11.4
Pel-3		6.9	18.3
LoEn to Wodejebato	0.7		19.0
Syl-1		7.7	
Syl-2A		2.5	29.2
Wodejebato to MIT	4.9		34.1
MIT-1(E)		13.2	47.3
MIT to Seiko	2.2		49.5
Seiko-1		3.5	
Seiko-2		3.0	56.0
Seiko to Tokyo Bay	1.0		57.0

Total on-site days = 45.1
Total steaming days = 11.9

Assumptions: 1. Ports are Majuro to Tokyo (or vicinity)
2. Steaming times are for great circles at 10 kts.

Notes on drillsites.

Allison-A. Objectives as in proposal 203E
- 600 meters of sediment, basalt
- APC/XCB until poor recovery (A-hole)
- RCB until bit destruction (B-hole)
- log

Huevo-A. Objectives as in proposal 203E
- Re-entry site with full cone
- 800 meters of sediment, 200+ meters of basalt
- APC/XCB until poor recovery (A-hole)
- log
- Set cone and casing
- Re-enter with RCB bits as necessary, drill to time on site (B-hole)
- log

Huevo-B. Objectives as in proposal 203E, but to 400 meters
- One RCB, carefully spudded, possible use of mini hard-rock base (A-hole)
- log

Syl-3. Objectives as in proposal 202E
- 900 meters of sediment, basement unexpected but welcome
- APC/XCB until poor recovery (A-hole)
- log
- RCB, wash to depth, drill to bit destruction (B-hole)
- log

Harrie-1. Objectives as in proposal 202E
- 450 meters of sediment, basalt
- APC/XCB until poor recovery (A-Hole)
- RCB, wash to depth, drill to bit destruction or time on site (B-hole)
- log

Harrie-2'. Objectives per proposal 202E
- Pelagic cap only site
- Suggest location at crossing of tracklines A-A' and F-F'
- 200 meters of pelagic sediment
- 2xAPC (A,B-holes)
- log

Pel-3. Full suite of objectives as Harrie-1 or Syl-1, from proposal 202E
400 meters of sediment, basalt
2xAPC in pelagic cap, XCB until poor recovery (A,B-holes)
RCB, wash to depth, drill to bit destruction or time on site (C-hole)
log

Syl-1. Objectives as in proposal 202E
400 meters of sediment, basement
APC/XCB until poor recovery (A-hole)
RCB, wash to depth, drill to bit destruction (B-hole)
log

Syl-2A. Objectives per proposal 202E
Pelagic cap only site
150 meters of sediment
2xAPC (A,B-holes)
log

MIT-1(E). Objectives as in proposal 203E
This is the location of the Engineering Leg site (backreef) on MIT
Mini hard-rock guide base, multiple re-entry site
520 meters of limestone, 300+ meters of basalt
RCB limestone depending on XCB experience from earlier sites. Re-enter with RCB as necessary for basalt drilling, drill to time on site (A-hole).
log

Seiko-1. Backreef setting, mini hard-rock guide base required
Objectives as for Charlie Johnson, proposal 203E
200 m limestone, basalt
RCB to destruction or time on site (A-hole).
log

Seiko-2. Lagoonal setting, otherwise as in Seiko-1.

000376

Lamont-Doherty Geological Observatory
of Columbia University

Palisades, N.Y. 10964

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Fax: (914) 365-2312
Telex: 710-576-2653
Cable: LAMONTGEO

RECEIVED
APR 0 8 1991
Ans'd............

To: James Austin
JOIDES Office
Univ Texas at Austin

From: Bill Ruddiman

April 8, 1991

I did not have minutes taken at the NAA DPG meeting, but a copy of a brief synopsis of the meeting is attached. I am mailing off a copy of the synopsis today, along with a copy of the prospectus. As I had told Allison Burns last week, I will not be attending the PCOM meeting due to a (long-standing) committment to be a visiting lecturer at the Quaternary Reasearch Center at the University of Washington from April 22-26. I told Margaret Leinen in february that I would not make the meeting, and she seemed prepared to take my place. She will receive a copy of the propsectus too.

Bill Ruddiman

000378

RECEIVED
APR 0 8 1991
Ans'd.........

NORTH ATLANTIC-ARCTIC GATEWAYS DETAILED PLANNING GROUP
SYNOPSIS OF FEBRUARY 1991 MEETING

The NAA DPG met at Lamont-Doherty Geological Observatory on February 18-20, 1991. The group consisted of William Ruddiman (LDGO, chairman and host), William Berggren (WHOI/OHP), Rudiger Henrich (FRG), Eystein Jansen (EFF/OHP), Larry Mayer (Canada), Peta Mudie (Canada), and Torre Vorren (ESF). Liaisons included Margaret Leinen (PCOM), Mitchell Lyle (LDGO/Borehole). Tim Francis (ODP/TAMU) also attended. Our mandate from PCOM was to examine 3 drilling proposals related to Atlantic-Arctic paleoceanographic gateways (# 305, 320 and 336) and to provide a prioritized plan for a drilling program.

The group first reviewed overall drilling objectives in the Arctic and Nordic Seas. We then considered all individual sites recommended in the three candidate proposals. At the start, we eliminated sites in the central or high Arctic as being beyond the logistical capability of the JOIDES Resolution due to permanent pack ice. We then blended the proposed sites located in seasonally open waters of the Arctic margin and Nordic Seas into a prospectus incorporating material from all three candidate proposals. This blending process was cordial and consensual.

The result was a drilling plan (prospectus) for two legs, with one given highest priority in the event that only a single leg can be allotted. The NAA DPG noted, however, that allocating only one leg to Arctic drilling increases the chance of losing key higher-latitude objectives to a "bad" sea-ice year. We also prioritized individual sites so as to provide the outline of a "fall-back" plan in the event that particular high-latitude sites are lost to weather considerations. We also noted that newly submitted proposals targeting drilling of fans near the Barents Sea could later be incorporated into the Arctic/Atlantic Gateways drilling plan, although such a task was deemed beyond the scope of the mandate set by PCOM. The drilling prospectus is submitted with these minutes.

William F. Ruddiman

William F. Ruddiman
Chairman

NARM-DPG Preliminary Report

To be distributed at the meeting

000380

000381

Petroleum Technology Center

RECEIVED
MAR 0 6 1991
Ans'd.........

Marathon Oil Company

P.O. Box 269
Littleton, Colorado 80160-0269
Telephone 303/794-2601

Post-It™ brand fax transmittal memo 7671 | # of pages ▸ 9

To C. Fulthorpe	From
Co.	Co.
Dept.	Phone #
Fax # 512-471-0999	Fax #

March 4, 1991

Sea-Level Working Group

D. Aissaoui
M.P. Aubry
R. Carter
N. Christie-Blick
P. Davies
A. Droxler
G. Eberli
R. Flood
R. Halley
T. Loutit
C. Kendall
K. Miller
G. Mountain
W. Sager
M. Sarnthein
J. Van Hinte
A. Watts
E. Winterer

Re: Synopsis of Littleton meeting and Plans for next meeting

From: Paul Crevello, Chairman SL-WG Paul Crevello

This brief letter summarizes discussions that took place at the end of the meeting on Sunday, but it also states our objectives and goals for the next meeting. Attached is a draft of the outline compiled at the meeting that states our mission, the certainties and unknowns facing the sea-level issue, the strategy for testing, and sites with probable high success for examining the sedimentary record of sea-level changes. This outline will serve as our starting point. The end result will be a position paper that mandates technical and scientific guidelines and strategies for investigations of global sea-level history and its sedimentary record.

2/5

For those that had to leave the meeting early, the following summary of discussions is provided. Complete minutes of the meeting will be distributed by mid April.

Relatively few additions were made to the outline after lunch, though discussion continued until 5:00 pm. Bob Halley presented his views about using carbonate exposure surfaces on atolls or carbonate ramps to track and measure the magnitude of sea-level fall. Discussion generated from Bob's presentation centered on adequate (close) spacing of drill sites to track the same unconformity, and the problem of resolving relative vs absolute sea-level change in the absence of a stable frame of reference.

Ken Miller discussed sites with potential for high-quality science objectives being met for the sea-level issue (table at end of outline). Note the shortage of sites for the Atlantic and the need for sites to adequately test the Doubt and Green House intervals. Shortage of sites is a major concern expressed by the SL-WG.

Issue on improving drilling technology to ensure high core recovery was discussed and will be addressed by J. Watkins at the next PCOM meeting.

Discussion during the final hour of the meeting focused on objectives and a venue for our next meeting. The following list briefly summarizes our discussions.

Objectives:

1) Complete outline by April 7 and formulate cover letter with the outline and minutes of meeting, which will be submitted to PCOM by April 20. PCOM meets April 24-25. Crevello and Loutit will serve as final editors of the outline. Return modifications of the outline to Crevello.

2) Complete first draft of position paper from outline by next meeting. Members intending to contribute text to the appropriate sections of the outline should identify those sections and notify Crevello by June 15. Details on how management, writing, merging, and editing of the text will be determined by June 15.

3) Working Group members will encourage proposals for 1993 Atlantic legs. Currently, only two proposals have been submitted. Initial contacts should be made by SL-WG members to gauge interest and maturity of potential proposals, and then relay this information to P. Crevello. Tom Loutit, as member of OHP, and P. Crevello, Chair of the SL-WG, will formally invite the PI's to submit proposals. We need to move quickly on this because PCOM will determine 1993 Atlantic sites at the December 1991. Therefore, it is critical that proposals are submitted to ODP by this August.

4) Identify additional sea-level sites/legs (see table by Miller) that will provide comprehensive coverage of depositional settings and time intervals. These sites must have a high potential for scientific achievement of the sea-level objectives.

5) Prioritize sites and formulate plan with optimum number of legs required to achieve sea-level objectives.

6) Identify three or four key individuals to present invited discussion papers at the next meeting. It is to our advantage that these key individuals possess expertise/knowledge in areas that will contribute a different dimension to our group. Erle Kauffman is a potential candidate and could address paleoecology and high-frequency stratigraphy in Cretaceous strata of the interior seaway. W. Schlager has been recommended as another potential speaker. Please supply nominations to P. Crevello by 1 July, earlier if possible.

7) Updated reference list. Members are asked to distribute galley/preprint/reprint of their papers on sea-level issues. Send papers to Craig Fulthorpe, JOIDES, who will distribute copies to the group. Please share preprints etc. by other authors, if given consent, or notify Crevello to contact author for consent to distribute papers.

Venue for next meeting

Scripps was nominated as the site for our next meeting with a tentative date proposed for November 1-3, subject to ODP approval. Two days of meetings and a 3/4 day field trip is planned.

cc. C. Fulthorpe
J. Watkins

000384

+ SEA LEVEL WORKING GROUP
  - MISSION

To formulate a strategy for estimating the timing, rate of change, and magnitude of the eustatic signal and the response of the sedimentary record.

To encourage high quality drilling proposals addressing eustatic issues.

To provide guidance for evaluating drilling plans based on this strategy.

+ APPROACHES: TO EVALUATE
  + SYNCHRONEITY OF STRATIGRAPHIC MARKERS
    + STRATEGY
      - GEOGRAPHIC SPREAD
      + INTERVAL TARGETING
        + Ice house
          + Plio/Pleistocene
            - Wanganui
            - Gulf of Mexico
            - Japan
            - Bahamas
            - Maldives
            - Northern Norwegian Sea
          + Late Oligocene-Miocene
            - Mid Atlantic
            - Eastern New Zealand
            - Florida Escarpment
            - Bahamas
        + Doubt house
          + Late Paleocene-Middle Eocene
            - Otway
        + Green house
          + Aptian-Santonian
            - Atolls/Guyots
      + TRANSECT SELECTION CRITERIA
        - Testable hypotheses
        - Plate tectonic setting
        - Crustal type/thickness
        + Basin classification
          - Foreland
          - Rift/Drift
        + Subsidence history
          - Airy isostasy
          - Regional isostasy (flexure)

+ Seismic grid
  - Set criteria relative to targets
  + Criteria
    + LDGO suggestion
      - 6-gun array
      - 20' tow depth
      - 120 channel streamer - 12.5m groups
      - 30 fold stack
      - 1msec sampling
      - GPS navigation
    - BMR suggestion
+ Well data
  - Logs
  + Sample-based data
    - biostratigraphy
    - geochemistry
    - physical properties
- Correlative outcrop availability nearby
+ Well-developed depositional sequences
  - Geometry
  - Facies
+ High resolution potential
  - Physical stratigraphy
  - Biostratigraphy
  - Chemostratigraphy
  - Magnetostratigraphy
+ Moderate burial depth
  - Time-efficient drilling program
  - Maximize seismic resolution
  - Minimize diagenesis
+ Platform selection
  - supplementary platforms (requires scientific and logistical support)
- Weather criteria

+ AMPLITUDES AND RATES
  + STRATEGY
    - GEOGRAPHIC SPREAD
    + INTERVAL TARGETING
      + Ice house
        + Plio/Pleistocene
          - Wanganui
          - Gulf of Mexico
          - Japan
          - Bahamas
          - Maldives
        + Late Oligocene-Miocene
          - Mid Atlantic
          - Eastern New Zealand

C/7

- Florida Escarpment
- Bahamas
+ Doubt house
  + Late Paleocene-Middle Eocene
    - Otway
+ Green house
  + Aptian-Santonian
    - Atolls/Guyots
+ TRANSECT SELECTION CRITERIA
  - Testable hypotheses
  - Plate tectonic setting
  - Crustal type/thickness
  + Basin classification
    - Foreland
    - Rift/Drift
  + Subsidence history
    - Airy isostasy
    - Regional isostasy (flexure)
  + Seismic grid
    - Set criteria relative to targets
    + Criteria
      + LDGO suggestion
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        - GPS navigation
      - BMR suggestion
  + Well data
    - Logs
    + Sample-based data
      - biostratigraphy
      - geochemistry
      - physical properties
  - Correlative outcrop availability nearby
  + Well-developed depositional sequences
    - Geometry
    - Facies
  + High resolution potential
    - Physical stratigraphy
    - Biostratigraphy
    - Chemostratigraphy
    - Magnetostratigraphy
  + Moderate burial depth
    - Time-efficient drilling program
    - Maximize seismic resolution
    - Minimize diagenesis

+ Platform selection
  - supplementary platforms (requires scientific and logistical support)
  - Weather criteria
+ METHODS/AREAS
  - OCEANIC ATOLLS AND GUYOTS
  + CONTINENTAL MARGINS
    + CARBONATE BANK MARGINS
      - PLATFORMS
    + SILICICLASTIC MARGINS
      - RAMPS (SHORT CLINOFORMS)
      - LARGE CLINOFORMS
    + MIXED CARBONATE/SILICICLASTIC MARGINS
      - RAMPS
      - RELICT SHELF
  + OXYGEN ISOTOPES
    - WARM END MEMBER (PLANKTONIC)
    - COLD END MEMBER (BENTHONIC)
+ SEDIMENTARY RESPONSE
  + PHYSICAL STRATIGRAPHY
    - Processes of unconformity formation
    - Facies analysis
    - STRATIGRAPHIC SURFACES
    + STRATIGRAPHIC UNITS
      - DEPOSITIONAL SEQUENCES
      - SYSTEMS TRACTS
      - PARASEQUENCE SETS
      - PARASEQUENCES
    - FACIES ARCHITECTURE
    - DEPOSITIONAL ENVIRONMENTS
    - SEDIMENTARY PROCESSES
  + AGE CONTROL
    - BIOSTRATIGRAPHY
    - CHEMOSTRATIGRAPHY
    - MAGNETOSTRATIGRAPHY
+ EUSTATIC MECHANISMS
  + GLACIO-EUSTASY
    + Strategy
      + Location
        - Western Equatorial (Tropical) Pacific and Atlantic
        - High latitudes
      - Time intervals
  - TECTONO-EUSTASY
  - Other mechanisms
+ **PROPOSAL SOLICITATION PROCESS**
  - WORKING GROUP MEETINGS
  - SCIENTIFIC OBJECTIVES
  + PROPOSALS IN SYSTEM
    - Miller et al. Mid-Atlantic Transect

- Joyce et al. West Florida Escarpment
- Ceara Rise

+ TECHNOLOGICAL ISSUES
  + shallow water drilling
    - ask Miller to write explanation of problem for Mid-Atlantic Transect
  + (DCS) diamond coring system
    - ask Winterer to write explanation of problem for Mid-Atlantic Transect
+ SHIP SCHEDULE
  + ATLANTIC
    - at least one sea-level leg
+ RESPONSIBILITY FOR SOLICITING
  + STRATEGY
    + Solicit more proposals for Atlantic by next SLWG meeting
      - Bahamas?
    - Proposals to JOIDES office by August at latest
    - Proposals need to be to panels (OHP and SGPP) by October
    - Proposals to key Joides personnel
    - Proposal reviews into PCOM by November
    - Solicit proposals that meet scientific objectives for future drilling

- **GUIDANCE PROCESS**

SL-WG TARGETS

	Siliclastic Margins	Carbonate Margins	Atolls	Deep Sea
Ice House				
Plio-Pleistocene	New Zealand ?S. China Sea	?Bahamas* ?Maldives	Mururoa*	Ont. J. CEARA Madeir
Oligo-Miocene	New Jersey New Zealand	?W. Florida ?Bahamas Marion Plateau		Ont. J.
Doubt House	?Ottway Basin		Harrie	
Green House			Marshalls Middle Pacific	

*Non-ODP Supplimental Drilling Ventures

Other Sedimentary Basins with potential

Alabama (Main Pass)	Olig-Miocene
Brazil Para-Maranhao	Doubt to Ice House
East Breaks (TX)	Plio-Pleistocene Ice House
Ceara Mundau	?Green-Ice House
Beaufort Sea	Ice House

000390

RECEIVED 000391
FEB 0 8 1991
Ans'd............

NATIONAL SCIENCE FOUNDATION
1800 G STREET, N.W.
WASHINGTON, D.C. 20550

DIVISION OF OCEAN SCIENCES
OCEANOGRAPHIC CENTERS AND FACILITIES SECTION
M E M O R A N D U M

DATE: February 7, 1991

FROM: Donald Heinrichs, Head OCFS

SUBJECT: U.S.S.R. Membership in ODP

TO: ODP Council Members

Academician Marchuk, President of the U.S.S.R Academy of Sciences, accepted the invitation of the U.S. National Science Foundation to participate in the Ocean Drilling Program on December 29, 1990. Academician Laverov, Chairman of the State Committee for Science and Technology, replied to Dr. Bromley on January 2, 1991 confirming the acceptance and recommending the ODP be included in the general plan of Soviet-American cooperation in the field of Basic Sciences.

The practical details on financial arrangements, shipboard participation, and coordination with US-USSR Basic Science agreement have been agreed to by both sides. Soviet membership in ODP starts May 1, 1991 with the drilling cruise (Leg 138) to the equatorial Pacific Ocean.

The Memorandum of Understanding was signed by Dr. Bernthal, Acting Director, NSF on February 5, 1991. It will be delivered to Academician Marchuk for his signature next week by Mr. Makarov, Chief Scientific Secretary, of the U.S.S.R. Academy of Sciences. The exchange by mail was agreed upon to provide for a timely signing of the MOU.

Soviet membership in ODP will be under the "policy umbrella" of the US-USSR Basic Science agreement. Dr. Bromley and Dr. Laverov plan to sign a Protocol implementing this action during a Basic Science Joint Commission meeting in Moscow during May 1991. We anticipate that the ODP program will be represented at the May meeting by a delegation of NSF staff, the ODP science operator, JOIDES representatives and other international partner members, some 8-10 people. Specific arrangements will be discussed with Dr. Nikita Bogdanov of the Institute for the Lithosphere and other academy offices.

It has been a long time since we started the MOU process and I look forward to its successful conclusion.

Donald F. Heinrichs

Donald F. Heinrichs

000392

TRANSLATION

RECEIVED
FEB 27 1991
Ans'd............

February 19, 1991 No. 44

Dr. Frederick M. Bernthal
Acting Director
National Science Foundation of the USA
1800 G Street, N.W.
Washington, D.C. 20550
USA

Dear Dr. Bernthal:

I am pleased to inform you that the President of the Academy of Sciences of the USSR, Academician G.I. Marchuk, has signed the text of the Agreement between the AS USSR and the National Science Foundation of the USA on the participation of the USSR in the program of deep-sea drilling in 1991-1993. Two copies of the text of the Agreement in the Russian language and one copy in the English language will be sent to you in the very near future.

We express our gratitude to you for the great efforts undertaken by the American experts in the preparation and negotiation of this Agreement and we hope for fruitful and mutually beneficial cooperation of the Soviet and American scientists in the implementation of the joint research on the basis of this program.

With best wishes,

Sincerely yours,

/s/

Academician I.M. Makarov
Chief Scientific Secretary
Presidium, AS USSR

000393

JOIDES Office
The University of Texas at Austin
Institute for Geophysics
8701 Mopac Boulevard
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Email: joides@utig.ig.utexas.edu

25 January 1991

Professor K. J. Hsü
Geologisches Institut
ETH-Zentrum
CH-8092 Zürich
SWITZERLAND

Dear Ken:

Please forgive the delay in replying to your interesting letter of 19 November, but I decided that your point-of-view needed a fair and general airing throughout PCOM, so I passed it on to all PCOM members for their comments. I have now received replies from a majority of the group (five U.S. and three non-U.S. members), ranging from the supportive to the critical, as you might expect. I intend to relate a few [anonymous] excerpts from those replies below, but I want to convey my own impressions first.

I admire you for the density of your comments. You disguise a number of significant criticisms of ODP within a generally positive frame-of-reference. First and foremost, I thank you again, on behalf of the scientific advisory structure, for your interest in and continuing support of scientific ocean drilling.

I agree with you that ODP must become more and more integrated with other international scientific initiatives. In pursuit of that goal, ODP now has formal liaison agreements with IGBP, FDSN, and Nansen Arctic Drilling. Additional agreements are pending with JGOFS and InterRIDGE. For your information, those "agreements" involve formation of small, parallel groups charged with exchange of information. The chair of each non-ODP liaison group reports on their activities to PCOM at its annual August meeting. By the way, Tom Pyle at JOI, Inc. has spearheaded this effort. Tom has been instrumental in reminding us that such integration is crucial to the continuing success of ODP. I will also remind PCOM at its next (April) meeting of the conferences that you are involved with, and encourage more JOIDES members to attend them. Please let the JOIDES office know about these conferences as they come up. We cannot participate in those meetings unless we know about them.

I am a little confused by your concept of JOIDES as an organization. You imply an adversarial relationship with the rest of the community (i.e., JOIDES vs. the "people"). My impression is somewhat different. I hear criticism that ODP is too controlled by "bottom-up" organization, i.e., submitted proposals control the activities of the drillship. There is some sentiment to return to a "top-down" structure, i.e., panel members (read

PCOM) decide where the drillship will go. I am personally against a "top-down" approach. We must drill top-quality thematic science brought to our attention by the community, and it must be adequately justified by supporting information (yes, multichannel seismic profiles, among other data). Sure, panels play a role in reviewing and prioritizing that science, but the fact remains that in FY 1992 (see upcoming issue of *Eos*), ODP will attempt to: sample an axial magma chamber at the East Pacific Rise, penetrate lower oceanic crust and upper mantle at Hess Deep, understand the nature of ridge-trench collision at the Chile Triple Junction, evaluate the role of fluids in accretionary prisms at the Cascadia margin, continue our series of global paleoceanographic transects in the North Pacific, and last but not least begin to assess the role of atolls and guyots as global "dipsticks" for fluctuating sea-levels through time. All of these efforts have evolved from submitted proposals, the "people." All are on the drilling schedule. This is not "ocean-mapping"! As Maria is so fond of putting it, "big science is winning out over politics." Your "peanuts"/"lollipops" (in your Epilogue) scenario just does not apply to ODP any more. If it did, I would not be involved, and ODP would not be worth renewing.

Finally, your idea for a CoRODBES conference is a good one. We have had discussions along similar lines within PCOM's Strategy Committee. I intend to bring this up to EXCOM at their June meeting in Washington, as such a meeting would require a great deal of advance planning (and money). For your information, ODP is about to undergo one of a series of Performance Evaluations by an outside committee of earth science experts only peripherally involved with ocean drilling. If given the opportunity, I plan to bring your idea up to them as well.

Now, for excerpts from other PCOM members and liaisons:

"...encourage Ken to publish his epilogue in *Eos* or some other widely distributed publication..." [a critical comment designed to encourage you to get all of your facts straight regarding the 1983-1985 period between the end of DSDP and the beginning of ODP]

"...ODP would do well in an international conference designed to discuss contributions of large international programs to Earth Sciences past and future. We are now solidly in a period of global science in terms of observations, problems, concepts and cooperation. It might be very useful to national and international sponsors to take an across the board look at all active and proposed large scale international earth science projects and international programs based on expensive facilities and assess their merits."

"COSOD did look at the big science initiatives and the big science problems. The present long range plan is in response to the perception of the community vis-a-vis the important problems to be solved."

"The...part of Ken's criticism which might be valid is that we need a better ODP press officer to sell our hottest results to the news media, and maybe that we have to fight for more programs in Global Change/environmental issues."

"...Ken should cut out the last 3 pages of the 'Epilogue' from his book. He is doing himself and all ODP scientists a very bad service with these half-true and false 'personal' statements which often rely on second-hand knowledge!"

"...ODP is operating and doing the things it should: exciting, high-priority science, optimized drilling strategy conceived on the basis of sound data, with a peer-review and planning structure that is fully represented in the international earth science community both within and outside the JOIDES institutions."

"Dating seismic reflectors and interpreting multichannel seismic are not necessarily inconsistent with environmental issues. One of the reasons for Co-chief Judy McKenzie's enthusiasm about Leg 133 was the remarkable discovery that the Great Barrier Reef is less than a million years old, based largely on dating seismic reflectors that can be traced up to and under the reef. Also on this leg, the combination of seismic onlap/offlap patterns and ODP cores is helping to determine the magnitude and timing of Neogene sea-level changes." [By the way, Leg 133 got a lot of press in Australia: newspapers, radio and television.]

"...my answer to Ken Hsü is that there are no quick and easy solutions. ODP is already addressing exciting scientific problems and must stick to the task of solving them."

"...I applaud the way in which he poses the question of ODP renewal - 1. What are the science problems? 2. How can drilling help to solve them?...I think we really need to take stock and ask the two fundamental questions..., and be brave enough to accept a partially negative answer...ODP cannot be all things to all scientists at all times...In the final analysis, the purpose of science and the role of scientists is to produce understanding; not to produce core, seismic profiles or chemical analyses. My sense is that ODP needs to discuss its role within that central purpose. It is going to take some clear thinking and strong advocacy."

Well, there you have it. I told you that there was diversity of opinion, even among the perceived "insiders" of PCOM. No Mafia here! Over the past several years, ODP has clearly done much soul-searching, and the search for improvement continues. What is emerging is a better program. I hope that you will come to believe that. We need your support for scientific ocean drilling in the 90's and beyond. Thanks again for your interest and input.

Sincerely,

Jamie

James A. Austin, Jr.
Senior Research Scientist and Chair,
JOIDES Planning Committee

JAA/ja

cc: A. Maxwell, EXCOM
T. Pyle, JOI
B. Malfait, NSF

000396

CALIFORNIA INSTITUTE OF TECHNOLOGY

DIVISION OF GEOLOGICAL AND PLANETARY SCIENCES 170-25

RECEIVED
FEB 28 1991
Ans'd..........

26.2.91

Dear Jamie:

Thank you for your letter of 25th January. I am shooting from the hip again, but it should be harmless, because I shall not use "live ammunition." This is just some general comment on your letter. On the big issue of the what ocean drilling can do for earth science, I stand pat, and I support Yves Lancelot's initiative, but I shall wait, until I come to Austin on April 8, to discuss the matter. I shall , as you might know, serve on the ODP-evaluation committee to be chaired by John Maxwell. I was told that we shall be meeting on the 8th, and possibly the 9th. I thought, if you wish, I could give a talk to your Institute and to the geology department,on the Environmental Changes at Time of Biotic Crisis, or on Why Earth Science is relevant to IGBP/Global Change Program? Those are areas where I think ocean drilling can do great things for earth science, and I would like to see your reactions to that.

I did imply JOIDES vs, the "people". You defended gallantly the policy of a "proposal-generated program," with the euphemism of "bottom-up organization." This is a fundamental issue, which we could perhaps discuss orally in Austin. I like the expression "grass-root," which implies the wilderness of a prairie. I question the tunnel-vision of your "bottom-up": the view of someone on the bottom of a second basement, Jamie, is not likely to be visionary.

Concerning the conferences coming up, you could certainly consult the Geotimes, EOS, etc. The one conference I shall be organizing will be the ESF's Scientific Conference on Natural and Anthropogenically Induced Hazards, to be held at Davos in late November or early December this year. As the chairman of the organization committee, I would like to invite JOIDES scientists to join the conference, and to present their ideas as to the possible contributions by ocean drilling on hazard prediction, reduction, or prevention. I shall send you more details if your response is tentatively positive.

I would like to thank those who made supportive remarks on my letter and on a draft of epilogue. I do object one remark, i.e.

Ken should cut out the last 3 pages of the "Epilogue" from his book. He is doing himself and all ODP scientists a very bad service with these half-true and false 'personal' statemetns which often rely on second-hand knowledge.!

I read the last 3 pages again, and I could not find any factual statement which is half-true and which relies on second-hand knowledge.

The critique has apparently not taken into consideration that I have served on ODP Planning Committee, that I have served on ODP Tectonics Panel, and that I was the chairman of ESF's ODP Scientific Committee. I have recounted my personal experience, and have not relied upon second-hand knowledge. (If I did say one of the persons told me that Denny Hayes's proposal was one the best, I was not relying on second-hand knowledge. I had first-hand knowledge of the proposal , which I discussed in all sessions of the Tectonics Panel meeting attended by me, and I only cited the opinion of a person who had served on P-Comm to indicate that my judgment of the proposal was not one-man's opinion.)

I do not see how could I do my self a very bad service, now that I am retiring and have no fear to be ostracacized by the ODP community, even if I have been offensive. From your digest of the comments, which seem to be mostly supportive, I think that I may be doing only a small minority of ODP scientists "a very bad service", such as the person who criticized my epilogue. It was intended to shock them out of the complacency so that they could no longer bury their head in sand, and that was the goal of the epilogue.

Finally, concerning the remark that I was "encouraged to get my facts straight," I would be grateful to get specific correction where the facts are not straight, rather than a general encouragement. Please indicate where the facts are not straight, even though I do not vouch for the "correctness" of all my interpretations.

With friendly greetings to you and to my friends on P-Comm, and see you in April.

Sincerely,

Ken Hsu

000398

RECEIVED
JAN 17 1991
Ans'd............

January 16, 1991

Dr. David K. Rea
Department of Geological Sciences
University of Michigan
1006 C.C. Little Building
Ann Arbor, MI 48109-1063

Dear Dave:

Many thanks for your letter of 10 January.

The drilling and logging times for the Atoll & Guyot and the North Pacific Transect sites are being calculated and you will get them in time for your AGDPG meeting on 27–28 February. I would have liked to attend this meeting myself, but it clashes with my going to Honolulu for Leg 136. So one of our staff scientists will be attending.

As far as the possibility of a Tokyo port call between Legs 144 and 145 is concerned, there are a number of problems:

1. ODP had a bad experience there after Leg 126 in June 1989. As a rule of thumb, we now estimate a Tokyo port call to cost about $100K more than Guam.

2. It can be very difficult to get certain categories of equipment, even when marked "ships stores in transit," to the ship. In 1989 Japanese Customs interpreted the COCOM rules very strictly.

3. It is impossible to get radioactive isotopes to the ship through a Japanese port. That would make the shipment of certain logging tools impossible.

My general feeling is that if a Tokyo port call saved only a couple of days, it would not be worth the trouble. But if it can add five or six days of on-site time, we should be prepared to take the logistical risks.

I assume that, in order to maximize on-site time on the Atolls & Guyots legs, you will be grouping the preferred sites into two legs so as to minimize transit times, rather than on scientific distinctions.

We look forward to seeing what your DPG comes up with. Good luck!

Yours sincerely,

Tim

Timothy J.G. Francis
Deputy Director

TJGF:hk

cc: James Austin, PCOM
Nick Shackleton, OHP
Rich Jarrard, LDGO
ODP Managers

Ocean Drilling Program
Office of the Director
Texas A&M University Research Park
1000 Discovery Drive
'lege Station, Texas 77845 USA
)) 845-8480
Telex Number: 62760290 ODP TAMU
FAX Number: (409) 845-4857

000399

RECEIVED
FEB 0 5 1991
Ans'd............

February 4, 1991

Dr. James Austin
Chairman, JOIDES Planning Committee
University of Texas at Austin
Institute for Geophysics
8701 Mopac Blvd., Room 300
Austin, TX 78759-8345

Dear Jamie:

"Add-on" Science and the Development of Seafloor Observatories

At its last meeting, PCOM endorsed the idea of "add-on" proposals of 1-4 days, on the understanding that the work is consistent with the thematic orientation of ODP as specified in the COSOD Reports and the Long Range Plan and also that it does not lead to an increase in leg length. The "Call for Proposals for Supplemental Science" further states that "Operations can include but are not restricted to the following: drilling/coring a new site (not necessarily thematically related to the leg on which the supplemental science is proposed) and/or expanding coring/downhole observations at a previously designated and approved site."

The advent of "add-on" science not only introduces an interesting flexibility into the development of ODP's drilling and coring operations, but could provide a major boost to the development of long term, seafloor observatories.

Seafloor observatories to date have tended to be small scale instruments of the "pop-up" variety, relying on their buoyancy to bring them to the surface after the release of sinker weights. Whilst the "pop-up" technique is admirably effective for certain types of measurement (e.g. OBS providing short term ocean bottom seismic observations, BATHYSNAP for time lapse photography of the seafloor), it imposes severe restraints on the size and weight of seafloor instrumentation. Normal oceanographic vessels rarely, if ever, deploy instrument packages to the deep ocean floor, either by free fall or on cables, which weigh more than a few tons. Most such instruments weigh less than a ton in air.

One of the unique qualities which *JOIDES Resolution* brings to marine science is the ability to deploy to/recover from precise locations on the ocean floor much larger packages. Our standard re-entry cones are 13 ft. in diameter; the Hard Rock Guide Base deployed on Leg 106 measured 17 ft. x 16 ft. x 11 feet high (5.2 m x 4.8 m x 3.4 m) and weighed about 20 tons. With the drill pipe, it is possible to deploy a load of almost 100 tons to a water depth of 5,000 m. The availability of the drillship, therefore, opens up the prospect of much more elaborate and heavier seafloor instrumentation than has hitherto been possible.

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Phase II (1993-97) of ODP's Long Range Plan calls for the "Development and initial deployment of long term observatories for ocean ridge and tectonic environments." These developments are planned outside ODP (e.g. in the RIDGE program). The scientific theme which these observatories will address is the study of magmatic and hydrothermal processes associated with crustal accretion. I believe that their development will be stunted if they are restricted to a small scale of oceanographic ship equipment. Deployment by the drillship, whether down drill holes or onto the seafloor, gives much greater freedom and scope to their designers. Thus in a couple of years we may expect "add-on" proposals to test seafloor observatories in the course of ODP legs. This would be entirely in keeping with the guidelines which you have developed so far for "supplemental science."

In a sense, we have already started to move down this road. The "cork" or re-entry cone seal being tested on Leg 136 is essentially a component of a seafloor observatory. Although the cork has been engineered at ODP-TAMU, the other observatory parts are being engineered elsewhere.

While seafloor observatories of the types discussed above clearly fall within the guidelines for "supplemental science," what would the position be if proposals unrelated to the drilling program were received? For example, physical oceanographers might plan a major bottom installation or marine biologists a seafloor laboratory which could only be deployed by a ship with *JOIDES Resolution*'s capabilities. The COSOD II Report recommends us to consider collaboration with other global scientific programs, specifically mentioning WCRP, WOCE, GOFS, among others. The Long Range Plan emphasizes the value of ODP to other major earth science initiatives. It seems to me, therefore, that we need to think further about what the limits of supplemental science should be. Broadening the community of marine scientists who might benefit from ODP's capabilities has two further implications:

1. Proposals could be received which are beyond the competence of existing JOIDES panels to judge.

2. Making ODP indispensable to the success of other major programs would assist in the renewal of our own program.

I would appreciate your views on these thoughts and suggest that the topic of "Supplemental science and the development of seafloor observatories" be put on the April or August PCOM agenda for discussion.

Best regards,

Tim

Timothy J.G. Francis
Deputy Director

TJGF:hk

cc: Dr. Philip Rabinowitz, ODP
ODP Managers

Proposal Updates

A) General comments

B) Log sheets with "abstracts" of proposals received between end of November 1990 and beginning of April, 1991

C) Master list of all ODP proposals, updated per April 11, 1991

A) General comments: Notes on Changes in JOIDES Proposal Numbering System

Ocean Indices: The earlier JOIDES Office used an integer followed by a slash and a character (A, B, C, D, E or F) indicating one of five major ocean areas as reference for a proposal (e.g., 999/A, A="Atlantic"). However, the numbering system should be as straightforward as possible, and not be subdivided into arbitrary categories. This becomes particularly obvious when using an electronic data base, which requires a unique value for each record. The 'one-out-of-five ocean' code is not sufficient for planning purposes either: on the one hand, Bering Sea, Chile Triple Junction, and all in between were E-type, and on the other hand some proposals covered both central/eastern Pacific (E) and western Pacific (D). Apart from being of little use, the indices were not self-explanatory. For these reasons, and also because initial evaluation of proposals is now done according to thematic priorities, ocean indices are **abandoned**. (Of course, the new relational data base at the JOIDES Office allows searching for and sorting of proposals by any argument that is defined by the input structure, e.g., *general area*, such as SE Pac., or *specific area*, such as EPR).

Proposal categories: The maturing process over years is one of the characteristics of ODP proposals. Along with this process go subsequent submissions of a proposal as revised versions and addenda. It is thus important that everybody and everything involved in the review/planning process (including Macintosh) can clearly recognize the various versions/addenda of a proposal in order to figure out which versions are the "active" ones. The way to achieve this is to maintain the basic number for subsequent versions/addenda and attach an identifying category affix to that number in order to make each version unique. The JOIDES Office therefore hase instituted the following proposal categories:

999---- New (initial) proposal. The four dashes are identifiers for new proposals; they may be left out in general use/correspondance, if the following are used without fail:

999-Rev A **revised version** of proposal 999; **always replaces the previous version.** Note that a third version, 999-Rev2, replaces the second version, 999-Rev.

999-Add An **addendum** to proposal 999. This can consist of additional sites, site survey or other scientific data, or objectives. Note that 999-Add2 stands for a second addendum, which may or may not replace the first one.

There are some unfortunate **exceptions** to the above numbering system due to inconsistent handling in prior years. Although it should be understood, and generally was practiced, that revised proposals keep their original stem number (e.g., 244), it repeatedly happened that a proposal was given an entirely new number (e.g., 296); the original proposal 244 "gets lost" in the system. In such a case, the JOIDES Office now refers to 296-Rev, although 296---- does not exist (as a general rule we will not change the stem number of a proposal in order to avoid confusion). The JOIDES Office will, in an attemt to assess the status of all ODP proposals over the next several months, include such "ghost numbers" with references in future master proposal lists. The following is an incomplete list of such numbers:

Initial proposal	Revised proposal	"Ghost number"
244----	296-Rev	296----
008----	318-Rev	318----
276----	346-Rev	346----
297----	353-Rev	353----
318-Rev	362-Rev	362----
342----	378-Rev	378----
349----	380-Rev	380----
343----	384-Rev	384----
350----	386-Rev	386----
375----	387-Rev	387----

Supplemental Science Proposals: The issue of supplemental science, as discussed at the PCOM meeting in Kailua-Kona last year, required an additional proposal category "S" (see also February *JOIDES Journal*), because these proposals are tied to scheduled shiptrack and thus subject to submission and review deadlines.

Letters of Intent: Letters of intent are forwarded to the panels for information, but not for review. They are referred to by the date received at the JOIDES Office, and may or may not be followed up by a proposal later on. In the past, it occasionally happened that letters were handled as proposals, given a number, and sent for review to the panels, although panels really cannot review a letter. This is the list to date of such letters:

Letter of Intent	"Ghost"
Nov 20, 1989	proposal 359
Jan 29, 1990	proposal 366

4/11/91

000403

ODP Proposal Log Sheet **S-1**

Proposal received: Nov 21, 1990

☐ *New proposal* ☐ *Revised proposal* ☐ *Addendum to proposal* ☒ **"Supplemental Science" Proposal**

Documentation of Lithofacies and Depositional Cyclicity, Navy Deep-Sea Fan, California Borderland

Abbrev. Title: Lithofacies and cyclicity, Navy Fan.

General area: Eastern Pacific

D.J.W. Piper, M.B. Underwood, and W.R. Normark

Contact:

Dr. David J.W. Piper
Atlantic Geoscience Centre
Bedford Institute of Oceanography
P.O. Box 1006
Dartmouth, Nova Scotia B2Y 4A2
CANADA

Tel: 1 (902) 426-6580/7730
FAX: 1 (902) 426-4104
Tmail: bedford.inst

Objectives:

LRP

14

Role of sea level change and autocyclic processes in forming cyclic turbidite sequences.

A. Record of eustatic changes in sea level.

B. Material cycling and sediment distribution.

Specific area: Navy deep-sea fan

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
NF-1	32°16.0'N/117°43.4'W	1785	150		150	Lithofacies, sed. cyclicity through prograding mid-fan.
NF-1A	32°17.7N/117°43.6'W	1800	110		110	If NF-1 too sandy: section of lateral lobe margin of midfan.
NF-2	32°20.3'N/117°51.0'W	1895	150		150	Contin. turbidite record over last glacial cycle (130 ka).
NF-3	32°12.8'N/117°49.2'W	1870	120		120	Lithofacies, cyclicity on distal depositional lobe.

Proposal acknowledged by JOIDES Office:	Dec 17, 1990	to:	Piper, D.J.W.
Proposal forwarded for review:	Dec 17, 1990	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Dec 17, 1990	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

Proposal Reference No.: **S-1**

Title: "ODP Proposal for a 6 Day Add-on for the Eastern Pacific—Documentation of Lithofacies and Depositional Cyclicity, Navy Deep-Sea Fan, California Borderland"

Proponents: D.J.W. Piper, M.B. Underwood and W.R. Normark

Summary*

WHERE: Navy Fan, southern Californian Borderland, 1800-1900 m water depth

WHEN: 6 day add-on to an eastern Pacific leg

WHY: To obtain short holes in distinct architectural elements on a small deep sea fan to understand role of sea level change and autocyclic processes in forming cyclic turbidite sequences. Will provide opportunity to test techniques for sand recovery and provide sedimentological basis for a fuller deep-sea fan program. Because Navy Fan is the best candidate in the world for understanding sandy fans, this opportunity should not be lost.

WHAT: Up to three APC/XCB holes, with standard Schlumberger and FMS logging if hole conditions permit, to subbottom depths of 120-150 m. Test of sand recovery technology.

PANELS: SGPP White Paper priority topics: - sea level change and margin sedimentation; - three dimensional facies architecture in turbidite systems; - basin-wide mass balances; - relationship of seismic stratigraphy to the in situ character of turbidite systems; - mass wasting and downslope resedimentation.

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000405

ODP Proposal Log Sheet 334-Rev

Proposal received: Dec 27, 1990

☐ *New proposal* ☒ **Revised proposal** ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Galicia margin S reflector and ultramafic basement

Abbrev. Title: S reflector and ultramafic basement, Galicia margin. General area: Eastern North Atlantic

G. Boillot, E. Banda, M. Beslier, and M. Comas

Contact:

Dr. G. Boillot
Technopolis 40
IFREMER
155, rue Jean-Jacques Rousseau
92138 Issy-les-Moulineaux Cedex
FRANCE

Tel: 33 (1) 4648-2100
FAX: 33 (1) 4648-2224
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Objectives:

Objective	LRP
1. Respective roles of pure and simple shear in the formation of passive margins.	7
2. Significance of the S reflector ("petrological Moho"): primitive C-M boundary or tectonic contact?	7/2
3. Evolution of mantle rocks during lithospheric stretching.	2
a) Peridotite origin, magmatic evolution during ascent, and metamorphic evolution.	
b) Mechanical behaviour during uplift: melting/deformation, heterogeneity of deformation.	
c) Mechanism of uplift: passive vs. active uplift.	

Specific area: Galicia margin

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
GAL 1	42°40'N/12°48'W	4500	500	1100	1600	Sample basement upon, through, and beneath S-reflector.
GAL 2	40°50'N/12°28.5'W	5400	600	100	700-	S-ext. of peridotite ridge; mantle unroofing and serpentiniz.
GAL 3	42°N/13°08W	5200	700	100	800	Mantel unroofing, serpentiniz. vs. basaltic crust emplacm.

Proposal acknowledged by JOIDES Office:	Jan 25, 1991	to:	Boillot, G.
Proposal forwarded for review:	Jan 25, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Jan 25, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	Feb 6, 1991	to:	NARM-DPG (North Atlantic Rifted Margins)

000406

Proposal Reference No.: **334-Rev**

Title: "Galicia Margin S. Reflector and Ultramafic Basement"

Proponents: G. Boillot, E. Banda, M. Beslier and M. Comas

Summary*

"....The main questions are:

1. What are the respective roles of pure and simple shear in the formation of passive margins? Current knowledge and hypothesis support simple shear along detachement faults for the Galicia margin. The best candidate for such a shear zone is a strong seismic reflector labelled S[8], that appears on seismic lines within the margin basement. To verify the hypothesis, it is necessary to obtain a controlled set of samples across S.
2. What is the nature of the lower "crust" beneath passive margins? Seismic velocities measured at this level on the Galicia margin relate to lower continental crust, whereas seismic correlations suggest serpentinite, i.e. hydrated mantle rocks. To discriminate, we need sampling.
3. What are the mechanisms for the emplacement of mantle rocks onto the seafloor at the ocean-continent boundary? We know that peridotite were emplaced at the Galicia rift axis just before seafloor spreading started at that latitude of the North Atlantic. However, the respective roles of asthenospheric diapirism and detachement faulting in the uplift and denudation of the mantle material remain a matter of discussion. Petro-structural studies of unquestionable subcrustal peridotite can help to answer that question. Moreover, the Galicia margin is one of the rare examples of mantle occurrence on the seafloor, where primary extensional structures were little or not at all disturbed by later tectonics (i.e., obduction of collision). Further petro-structural studies of mantle rocks will contribute to characterize the evolution of mantle during its uprise and emplacement beneath a continental rift...."

"....The main reason for this persistent interest in the Galicia margin is probably the presence of only a thin and discontinuous sedimentary cover (0-3 km), and hence unusually easy access to rift structures and basement. Seismic images are particularly clear, and oldest sediments or basement can be sampled by drilling and even by dredging or diving with submersibles. These facilities allow the collection of data which is inaccessible in other passive margins. We believe that exploitation of these exceptional conditions must continue. Without doubt, Galicia margin studies advanced our knowledge and ideas about the formation of continental rifts and non-volcanic passive margins. However, several problems concerning the processes of continental lithosphere stretching remain. They now seem to be well framed, and their solution through further work along the Galicia margin appears possible...."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000407

ODP Proposal Log Sheet 391----

Proposal received: Jan 2, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Depositional History and Environmental Development During the Formation of Sapropels in the Eastern Mediterranean

Abbrev. Title: Formation of sapropels, eastern Mediterranean. General area: Eastern Mediterranean Sea

R. Zahn, E.A. Boyle, S.E. Calvert, F.G. Prahl, and R.C. Thunell

Contact:

Dr. Rainer Zahn
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GERMANY

Tel: 49 (431) 720-2171
FAX: 49 (431) 725-650
Tmail: J. Thiede

Objectives:

LRP: 15

1. Long-term history of sapropel form. in rel. to state of global climate and orbital insolation param.
2. Contribution of marine vs. terrestrial sources to the organic fraction of the sapropels.
3. Water column redox conditions and (paleo-) productivity levels during sapropel formation.

Specific area:

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed Bsmt Total	Brief site-specific objectives

Comments: HPC cores as part of tectonically oriented transects (see C.I.E.S.M. workshop and JOIDES proposal 330),
Comments: provided that the sedimentary structures prove suitable for our investigations.

Proposal acknowledged by JOIDES Office on: Jan 25, 1991
Proposal forwarded for review to: LITHP, OHP, SGPP, TECP on: Jan 25, 1991
Proposal copies to: JOI, SO, SSDB
Detailed Planning Group Assistance:
Proposal forwarded to DPG: 00/00/00

000408

Proposal Reference No.: 391----

Title: "Depositional History and Environmental Development During the Formation of Sapropels in the Eastern Mediterranean" An ODP Proposal for a Detailed, High-Resolution Multi-Tracer Survey

Proponents: R. Zahn, E.A. Boyle, S.E. Calvert, F.G. Prahl and R.C. Thunell

Summary

Despite an ever increasing data base of chemical, faunal, and stable isotope proxy data coming from sediment cores in the eastern Mediterranean, the origin of sapropels is still controversial. Opinions are divided into two groups, one promoting the stagnation hypothesis and the other being more in favour of a high-productivity scenario. Evaluation of published data has led to the conclusion that variations in sediment texture, dilution and the settling flux of carbon exert a dominant control on the carbon contents of sediments and that water column redox conditions play only a secondary role. Moreover, recent evidence that the early-Holocene sapropel found in the Black Sea - the "type" euxinic basin usually referred to by those favouring the stagnation hypothesis - has accumulated under well-ventilated conditions, appears to underscore the importance of productivity over anoxia. In view of the apparent controversy, *i.e.* anoxia *versus* high-productivity, we propose a systematic survey of the eastern Mediterranean sapropels using new chemical tracers which would allow independent estimates of redox conditions and carbon fluxes. The aim of the survey is to reveal the individual importance of bottom-water anoxia and biological productivity in surface waters for each of the Mediterranean sapropels. Given the large carbon reservoir of the world ocean, this may also provide a better understanding of the mechanisms which define the architecture of the ocean's carbon reservoir, which controls the atmosphere's chemistry and, ultimately, Earth's climate.

000409

ODP Proposal Log Sheet 392----

Proposal received: Jan 29, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

A Mantle Plume Origin of the North Atlantic Volcanic Rifted Margins: Testing the Model Against Geological Data

Abbrev. Title: Mantle plume origin, North Atlantic volcanic margins. General area: Labrador Sea

H.C. Larsen, J.A. Chalmers, L.M. Larsen, A.K. Pedersen, N. Hald, C. Keen, S.P. Srivastava, K.G. Cox

Contact:

Dr. Hans Christian Larsen
Geological Survey of Greenland
Øster Voldgade 10
DK-1350 København
DENMARK

Tel: 45 (31) 118-866
FAX: 45 (31) 935-352

Objectives:

Objective	LRP
1. Temp./geochem. correlation betw. W. Greenland onshore volcanics and cont. margin volcanics incl. SDRS.	
2. Correlation of (1.) to NE Atlantic transient hot-spot activity (5 million years period or distinct events?).	7
3. Timing of margin block faulting in rel. to start of volcanism and final breakup: are they different events?	7
4. Do peridotite ridges close to cont.-ocean transition exist, suggesting crustal rupture through simple shear?	7
5. If peridotite ridges exist, what is their age of formation relative to VRM features and block faulting?	7
6. Later VRM formation onto existing non-volcanic Bay of Biscay/Galicia Bank type margin, or coincident?	7

Specific area: Southwest Greenland margin at 61° - 63° N

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
LABS-1	62N/58W	2400	750	1000	1700	Drilling through SDRS (dating, correlation with onshore).
LABS-2	63N/57W	2300	2250	50	2300	Syn-rift sequence next to feather edge of SDRS.
LABS-2'	-/-					Alternate to LABS-2.
LABS-3	63N/54W	2450	1150	50	1200	As LABS-2.
LABS-4	63N/54W	2450	1550		1550	Post-, syn-, and upper pre-rift sediments over tilted block.
LABS-5	61N/53W	3120	1270	400	1670	Supposed peridotite ridge.

Proposal acknowledged by JOIDES Office:	Feb 7, 1991	to: Larsen, H.C.
Proposal forwarded for review:	Feb 7, 1991	to: LITHP, OHP, SGPP, TECP
Proposal copies:	Feb 7, 1991	to: JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to: (To NARM-DPG in April if warranted by panels.)

Proposal Reference No.: 392----

Title: "A Mantle Plume Origin of the North Atlantic Volcanic Rifted Margins"

Proponents: H.C. Larsen, J.A. Chalmers, L.M. Larsen, A.K. Pedersen, N. Hald, C. Keen, S.P. Srivastava, K.G. Cox

Summary*

"....Recently, new scientific and oil exploration seismic data from various passive margins strongly indicate that volcanic rifted margins (VRM's) are much more extensive than previously demonstrated (N Atlantic, Labrador Sea?, most of S Atlantic, Antarctica, India, Australia). Hence, VRM formation may in fact be the dominating development during the progressive continental break-up of Pangea (Coffin et al., in press).

Accordingly, it is likely that the break-up processes leading to VRM formation are an important dynamic factor in continental break-up at least in Pangea break-up.

The growing understanding of the role of VRMs in continental break-up has revived the idea of mantle plume generated hot-spots and their possible active role as a plate driving force and as a cause of continental break-up (White and McKenzie, 1989). A simple experimental model of such narrow mantle plumes originating at the mantle-core boundary was recently published (Campbell and Griffiths, 1990). Mutter et al. (1988) have argued that smaller scale convective mechanisms in an early rift zone in think, cool continental lithosphere can produce sufficient extra heat without involving mantle plumes to cause transient VRM formation. Others (Pedersen and Skogseid, 1989) require only a modest temperature anomaly (weak hot-spot, not necessarily a narrow mantle plume) if pre-thinned continental crust is present.

Differences of opinion also exist on the general tectonic structure of extensional, continental rifts and have been debated in parallel with the VRM debate. Symmetric pure shear stretching of the crust and lithosphere in connection with continental rifting was used by McKenzie (1978) for modelling of basin subsidence. Others suggested asymmetric, crust penetrating simple shear to be an important element in rift development (Wernicke, 1985). Recent recovery (through ODP drilling) of serpentinized mantle peridotite in backarc rifts (Tyrrherian Sea) and along an outer, non-volcanic margin (Galicia Bank) indicate the need for explaining why mantle and lowermost crust material is exposed in rifts and on divergent continental margins (Boillot et al., 1989)....."

"....A number of different drilling proposals on this general problem area exist and the present one should be seen in conjunction with these proposals....."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000411

ODP Proposal Log Sheet

393----

Proposal received: Jan 29, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Drilling the Continent-Ocean Transition on the SE Greenland Volcanic Rifted Margin: Linking Continental Flood Basalts to Seaward Dipping Reflector Sequences

Abbrev. Title: Continent-ocean transition, Greenland volcanic margin. General area: North Atlantic

H.C. Larsen, T.D.F. Nielsen, L.M. Larsen, C.K. Brooks, K.G. Cox, A.G. Morton, B. Larsen

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Objectives: LRP

1. To link well-studied cont. flood basalts of E. Greenland to adjacent seaward dipping reflector sequences. 7
   - Stratigraphic correlation of CFBs to SDRSs, extent of pre-/syn-/post-spreading origin.
   - Correlation with conjugate Faeroe-Rockall margin (existing holes and seismic data).
2. Tectonic, thermal and igneous composition and history of the continent-ocean transition (COT). 7
   - Mainly mechanical thinning (pure/simple shear) versus mainly thermal thinning of cont. lithosphere.
   - Width of COT, deformational processes and their thermal regime.
   - How much continental crust is left, how is it replaced by igneous crust and oceanic lithosphere?
   - Does COT develop differently in cratonic basement terrain than in a multi-rift area like Vøring margin?
   - Flexuring versus faulting during and after breakup.

Specific area: Southeast Greenland margin at 65°N

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
SEG#1	66N/35W	250	?	+50	1200	SDRS (hinge zone) composition, structure and deformation.
SEG#2	66N/35W	280	0	1800	1800	Lower SDRS and underlying pre-rift sediments, basement.
SEG#3	66N/35W	260	0	1100	1100	Middle and upper SDRS, complementary to SEG#2 & 4.
SEG#4	66N/35W	380	730	520	1250	Post-rift sed. sequence (subsid. history) and upper SDRS.
SEG#5	66N/35W	300	0	300	300	Acoustic. opaque zone between coastal dikes and SDRS.

Proposal acknowledged by JOIDES Office:	Feb 7, 1991	to:	Larsen, H.C.
Proposal forwarded for review:	Feb 7, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Feb 7, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	(To NARM-DPG in April if warranted by panels.)

000412

Proposal Reference No.: 393----

Title: "Drilling the Continent-Ocean Transition on the SE Greenland Volcanic Rifted Margin: Linking Continental Flood Basalts to Seaward Dipping Reflector Sequences"

Proponents: H.C. Larsen, T.D.F. Nielsen, L.M. Larsen, C.K. Brooks, K.G. Cox, A.G. Morton, B. Larsen

Summary

"....In most areas, the break-up level (break-up unconformity) is now deeply buried below younger sediments and the basement is very often even more deeply buried. The depth of burial may often limit the resolution of geophysical observations such as gravity, magnetics and seismics, and almost inevitably place pre-break-up stratigraphic levels beyond the reach of ODP drilling. However, an unique exception and escape possibility from this general burial problem is provided by parts of the SE Greenland volcanic rifted margins. Uplift and erosion in combination with a partly starved sedimentary margin formation here has provided us with coastal, basement exposure of the innermost COT around or just below break-up conformity level. Further seaward, exposure of the COT at seabed level (break-up unconformity level) is present over approximately 30 km on the inner shelf. This unique exposure is replaced to seaward by outcrop of the erosionally truncated landward end of the seaward dipping reflector sequence (SDRS) off SE Greenland (Larsen and Jakobsdóttir, 1988) and further seaward by a more intact SDRS overlain conformably by post break-up sediments.

The present drilling proposal is focused into drilling transect from the coastal exposures of the COT and seawards into the SDRS. The proposed drilling can be divided into parts A and B and will be aimed at: (part A) to link the well-studied continental flood basalts of East Greeland to the adjacent seaward dripping reflector sequence and (part B) to understand the tectonic, thermal and igneous composition and history of the COT. A continuation of the transect further seawards through the complete SDRS and into normal oceanic crust would be preferable, but probably not feasible at the location because of thick sediment cover. Alternatively, this outer part of the transect ...."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000413

ODP Proposal Log Sheet 365-Rev

Proposal received: Feb 4, 1991

☐ *New proposal* ☒ **Revised proposal** ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Conjugate Passive Margin Drilling — North Atlantic Ocean

Abbrev. Title: Conjugate passive margins, North Atlantic General area: North Atlantic

J. Austin, G. Boillot, M.C. Comas, A. Grant, F. Gradstein, L. Jansa, C. Keen, K.E. Louden, P.R. Miles, J.C. Sibuet, S.P Srivastava, B.E. Tucholke, and R.B. Whitmarsh.

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Objectives:

Objectives	LRP
1. Tectonic and lithospheric objectives for (i) across NFC margin, and (ii) both sides of NNB-IAP transect. (NFC-GS: N. Flemish Cap - Goban Spur; NNB-IAP: N. Newfoundland Basin - Iberia Abyssal Plain)	7
• Composition of faulted basement blocks.	
• Age, nature and source of the apparent synrift section (sediments and associated volcanics).	
• Age and Nature of major reflection identified as the breakup unconformities.	
• Uplift and subsidence history to evaluate the mechanical and thermal processes of basin evolution.	
• To verify formation of a very wide zone of thinned continental crust in this region.	
2. Paleoceanographic objectives.	
• Earliest (L. Triassic - M. Jurassic) paleoenvironment of shallow seaway between Tethys and North Atlanti	6
• Sea level fluctuations (E. Cretac., Tertiary) from extensive, flat, stable, shallow margins of intermed. age.	14
• Onset of the proto Gulf Stream which affected circum Atlantic watermasses and pelagic biota dispersal.	13
• Timing/intensity of establishment of strong, deep circulation about L. Eocene - E. Oligocene (Horizon A).	13
• History of paleoproductivity and nutrient cycling in this gateway region (black shales, biosiliceous sed.).	13/15

Specific area: N. Newfoundland Basin — Iberia Abyssal Plain; N. Flemish Cap — Goban Spur

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
NB1	45°02'N/48°44'W	1200	1650		1650	Age/duration of pre-Mid-Cretac. (multiple?) rifting phases.
NB2	44°57'N/46°43'W	3630	2480	250	2730	First alternate to NB4.
NB3	44°27'N/46°55'W	3949	2060	250	2310	Age/nature of synrift sequ.; test for cont. crust; U-reflector.
NB4	44°26'N/46°47'W	3926	2200	250	2450	Mid-Cret. breakup unconf. (U-refl.); syn-rift sed. sequence.
NB5	43°28'N/46°47'W	4177	2630	300	2930	Second alternate to NB4.
NB6	43°27'N/46°42'W	4215	2200	300	2500	Alternate to NB3.
NB7	44°12'N/45°41'W	4200	720	280	1000	Nature and age/depth history of J-anomaly bsmt. ridge.
NB8	44°16'N/45°12'W	4332	1450	150	1600	Age/nature of tilted bsmt. fault block, synrift sed., unconf.
NB9	44°16'N/45°09'W	4301	1700		1700	As NB8.
NB10	42°04'N/46°43'W	4530	1110	100	1210	Alternate to NB8.
IAP1	40°41'N/11°57'W	5200	1870		1870	Most complete sequ. to date breakup; syn/post-rift subsid.
IAP2	40°41'N/12°07.5'W	5200	850	100	950	Cont. pre-rift sed/metased.; effect of crustal streching.
IAP3	40°41'N/12°54'W	5500	1120	100	1220	Age/nature of oldest oceanic crust; onset of spreading.
IAP3A	40°36'N/12°46.5'W	5500	930	100	1030	As IAP3.
IAP4	40°50'N/12°28.5'W	5400	560	100	660	Is basement ridge serpentinised peridotite?

000414

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
IAP4A	40°49'N/12°28.5'W	5400	900	100	1000	As IAP4.
GS1	49°00'N/13°18'W	3650	1450	150	1600	Subsidence history; nature/age of synrift sedim., basement.
FC1	48°54.2'N/44°1.3'W	2481	1636	24	1660	Age/duration/subsid.history etc. of pre-Mid-Cret. rifting.
FC2	48°55.4'N/43°35.6'W	3390	1985	15	2000	Nature of rocks here associated with cont./ocean boundary.
FC3	48°56.5'N/43°07.4'W	3865	1600	30	1630	Age/nature of oceanic crust; episode of faulting in bsmt.
FC4	48°31.5'N/43°50.7'W	1702	1876		1876	As FC1.
FC5	48°36.2'N/43°29.9'W	3271	1502		1502	As FC1.
FC6	48°41.9'N/43°5.3'W	3852	1667	33	1700	As FC1.
FC7	48°04.8'N/43°47.5'W	2760	2040		2040	As FC1.
FC8	48°17.9'N/42°46.4'W	3930	1660	40	1700	As FC3.

Proposal acknowledged by JOIDES Office:	Feb 7, 1991	to:	Srivastava, S.P.
Proposal forwarded for review:	Feb 7, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Feb 7, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	Feb 6, 1991	to:	NARM-DPG (North Atlantic Rifted Margins)

Proposal Reference No.: 365-Rev

Title: "Conjugate Passive Margin Drilling-North Atlantic Ocean"

Proponents: J. Austin, G. Boillot, M.C. Comas, A.Grant, F. Gradstein, L. Jansa, C. Keen, K.E. Louden, P.R. Miles, J.C. Sibuet, S.P. Srivastava, B.E. Tucholke and R.B. Whitmarsh

Summary*

"....We propose a study of two transect corridors in the North Atlantic: Goban Spur-North Flemish Cap and Iberia Abyssal Plain (NFC-GS) - North Newfoundland Basin (NNB-IAP). The width of these corridors is determined by our knowledge of the along-strike segmentation of the margins. Our goal is to drill conjugate sections within a single geophysically defined rift segment, so as to minimize along-strike variability. These two corridors differ primarily in the extent of syn-rift continental extension and post-rift break-up asymmetry which they exhibit. The rationale for exploiting these differences is that we want to establish how lithospheric deformation differs with varying degrees of structural asymmetry and extension...."

"....Drilling objectives on these transects include the following:
NNB-IAP Transect: A site on the continental slope to document timing of the two rift phases present in this area (Late Triassic-Early Jurassic, Late Jurassic-Cretaceous) and the subsidence history of slightly extended crust; sites on presumed highly thinned continental crust in the deep basins, and on the basement ridge at the J anomaly (presumably oceanward of the ocean-continent boundary [OCB]), to document the nature of basement, breakup unconformity, and subsidence history; sites seaward of the J anomaly, on ocean crust that is structured by a "ladder" of normal, seaward-dipping faults, to document crustal age/composition/subsidence history.
NFC-GS Transect: Sites are located on the North Flemish Cap margin, on slightly to highly extended continental crust and across the OCB to oceanic crust, to document crustal age, composition and subsidence history. Drilling on the Goban Spur half of the transect already has been accomplished. However, drilling at one additional site on Goban Spur is proposed to obtain a complete sequence of the syn-rift sediments to better control its subsidence history...."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000415

ODP Proposal Log Sheet 394----

Proposal received: Feb 4, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Evolution of pre- and syn-volcanic extensional basins on passive volcanic continental margins

Abbrev. Title: Pre/syn-volcanic extensinal basins on passive v. margins. General area: North Atlantic

L.V. Kiørboe, K. Gunnarson, M.S. Andersen, and L.O. Boldreel

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Objectives:

LRP: 7

Development of a rifted volcanic passive margin (VPM).

- Sampling pre-volcanic units; constrain models for evolution of VPM based on sedim. and biostratigraphy.
- Sampling volcanic rocks; study geochemistry to provide information on magmatic evolution of VPM.
- Eocene to Oligoc. sedim. succession; paleoenv. of evolving margin and post-breakup structural evolution.
- Geochemical compsition and age of sills relative to other magmatic rocks and to faulting activity.

Specific area: Southeastern Hatton Rockall Basin

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
HRB-1	55°20'N/18°26'W	1398	1600		1600	Pre-, syn- and post-rifting rocks.
HRB-2	55°19'N/18°33'W	1284	1200		1200	Sampling pre-, syn- and post-rifting rocks.

Proposal acknowledged by JOIDES Office:	Feb 7, 1991	to:	Kiørboe, L.V.
Proposal forwarded for review:	Feb 7, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Feb 7, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	(To NARM-DPG in April if warranted by panels.)

000416

Proposal Reference No.: 394---

Title: "Evolution of Pre- and Syn-Volcanic Extensional Basins on Passive Volcanic Continental Margins"

Proponents: L.V. Kiørboe, K. Gunnarson, M.S. Andersen, L.O. Boldreel

Summary*

"....Objectives of this Proposal

The main objective of this proposal is to investigate the substratum of the volcanic rocks associated with the formation of a passive volcanic margin, in order to constrain models for the formation of a volcanic passive margin.

A secondary objective of the investigation is to provide data on the nature of development before, during and after the volcanism....."

"....The following seismic stratigraphic units are identified passing down-section from the seafloor:

1) The uppermost unit, unit 1, is expected to be composed of deep-water sediments of Neogene to Quaternary age. The seismic stratigraphy is supported by correlation to the DSDP 116 and 117 wells, situated about 280 km from this area.
2) Unit 2 is expected to represent sediments of Eocene to Oligocene age. The seismic stratigraphy is supported by correlation to the DSDP 116 and 117 wells situated about 280 km from this area.
3) The volcanic unit, unit 3, is associated with the continental break-up between Greenland and Europe.
4) A parallel-layered unit, unit 4, is observed beneath the volcanic unit. Unit 3 apparently rests conformably on unit 4. Unit 4 onlaps the underlying unit 5.
5) The deepest observed seismic unit (unit 5) appears to show parallel or slightly divergent layering, and is tilted towards the west. The upper boundary of unit 5 is erosionally truncated to the east. The unit has a rather high refraction velocity. The velocity varies between 4.8-5.0 km/s, characteristic of chalk or rather compacted clastic sediments....."

"....The specific objectives for scientific drilling in the Hatton-Rockall area.

1) Sampling of the pre-volcanic units in order to constrain the models for the evolution of volcanic passive margins, on the basis of sedimentological and biostratigraphical studies of these units. It is important to penetrate as complete a succession of unit 4 as possible, and to reach unit 5, as the age of these units will provide limits for the age of the main tilting observed on the seismic sections.
2) Sampling of the volcanic rocks in unit 3, in order to study their geochemical composition and thus provide information concerning the magmatic evolution of a volcanic passive margin.
3) Penetration of unit 2, where the most complete succession is represented. Drilling unit 2 will allow a study of the palaeoenvironment of the evolving margin and constrain the post-breakup structural evolution.
4) Penetration of the sills in order to investigate their geochemical composition and their age relative to the other magmatic rocks and to the faulting activity.

A complete section of unit 1 would be desirable, but his unit is considered to be a secondary objective of this proposed drilling program....."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000417

ODP Proposal Log Sheet 323-Rev

Proposal received: Feb 11, 1991

☐ *New proposal* ☒ **Revised proposal** ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

The Alboran Basin and the Atlantic - Mediterranean Gateway: Neogene Evolution of Continental Basement Overthrusting and Extension in the Alboran Sea and the Development of the Atlantic - Mediterranean Gateway

Abbrev. Title: Alboran basin and Atlantic-Mediterranean gateway. General area: Mediterranean Sea

M.C. Comas, J.C. Faugère, J.A. Flores, V. Garcia-Dueñas, M.J. Jurado, R. Kidd, J. Mackris, A. Maldonado, A.G. Megias, H. Nelson, F.J. Sierro, D.A.V. Stow, R. Stephenson, C. Vergnaud-Grazzini and J. Woodside

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Objectives: LRP

1. Deformation processes at convergent plate boundaries. 8
   • nature and timing of vertical and horizontal displacements
   • synchronous basin formation and sedimentation
   • crustal flexure
   • deformational structures
2. Mesoz.-Cenoz. seaways across W and E Tethys, and Neogene paleoceanographic-climatic-glacial history. 12/13
   • Neogene history of Atlantic-Mediterranean sea-level oscillations, water exchange and circulation patterns
   • amplification of climatic signals in marginal ocean basins.

Specific area: Alboran Sea

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
A1-1	36°12.3'N/04°24.5'W	1036	3000		3000	Synrift sed., subsidence; top of main rifting graben bsmt.
A1-1A	36°14.5'N/04°09.1'W	850	2200		2200	Alternate to A1-1A
A1-1B	36°11.7'N/04°25.7'W	925	1100	100	1200	Basement high: rifting mode; role of volcanism.
A1-2	35°43.5'N/03°12.3'W	836	1500		1500	Mioc-Rec sed.; date/style compress. stage; post-rift subsid.
A1-2A	36°10.8'N/02°44.6'W	1773	1300		1300	Alternate to A1-2.
A1-3	36°11.5'N/05°08.7'W	518	1400		1400	Date, sample lowermost synrift sed. in thrust's footwall.
GC-1	36°42'N/07°19'W	550	600		600	Condensed Plio-Quaternary sequence.
GC-1A	36°24'N/06°47'W	350	500		500	Alternate to GC-1.
GC-2	36°21'N/07°13'W	570	500		500	Non-condensed Plio-Qaternary section.
GC-2A	36°22'N/06°51'W	453	500		500	Alternate to GC-2.
GC-3	36°15'N/07°03'W	760	500		500	Thinly covered (channel walls) lower Pliocene section.
GC-3A	36°19'N/06°56'W	500	500		500	Alternate to GC-3A.

Proposal acknowledged by JOIDES Office on: Feb 12, 1991
Proposal forwarded for review to: LITHP, OHP, SGPP, TECP
Proposal copies to: JOI, SO, SSDB
Detailed Planning Group Assistance: ()
Proposal forwarded to DPG: 00/00/00

000418

Proposal Reference No.: **323-Rev**

Title: "The Alboran Basin and the Atlantic-Mediterranean Gateway"

Proponents: M.C. Comas, J.C. Faugères, J.A. Flores, V. García-Dueñas, M.J. Jurado, R.Kidd, J. Mackris, A. Maldonado, A.G. Megias, H. Nelson, F.J. Sierro, D.A.C. Sotw, R. Stephensen, C. Vergnaud-Grazzini and J. Woodside

Summary*

"....The evolution of the North Balearic Basin appears to be analogous to W-Pacific back-arc basins: it is generally accepted that the Neogene extension of the North Balearic Basin (Ligurian Sea), the anticlockwise rotation of Sardinia, and the subduction of Mesozoic Tethyan oceanic crust beneath the island occurred contemporaneously. However, there is disagreement about the origin of the back-arc extension in the other Western Mediterranean basins. In these other basins the swift evolution of a collision zone into superimposed regions of extension, and adjacent contraccion has not been adequately explained (Channel and Mareschal, 1989).

Some authors have emphasized the role of the anomalous mantle diapirism, the extensional locus of the basin being static (Van Bemmelen, 1972; Weijermars, 1985; Wezel, 1985), whereas others consider that the basinal extension is contemporary with the subduction, similar to the W-Pacific backarc model (Biju-Duval et al., 1978; Rehault et al., 1985; Dercourt et al., 1986; Malinverno and Ryan, 1986). Removal and detachment of the thickened mantle lithosphere during the last episode of the convergent process has been invoked to explain the subsequent lithosphere thinning superimposed on the collision zone: Bird (1979) has proposed the delamination of the mantle lithosphere and Houseman et al. (1981) have proposed sinking by convection. Channel and Mareschal (1989) indicate the possibility that delamination may account for the coexisting adjacent extension and contraction within the collision suture. Their models show that an asymmetric lithospheric thickening generates asymmetrical flow in the underlying mantle, and extension and contraction in contiguous regions.

The Alboran Basin can be considered as a suitable example of such an inner-arc basin, where the above summarized lithosphere mechanisms can be fully investigated. In addition, investigation into the tectonic evolution and subsidence history of Alboran may shed light on the nature of the common phenomena in convergent settings. In our opinion a **drilling target in the Alboran Sea would systematically test the response of the crust to both compression and extension forces.** This drilling target satisfies one of the priority objectives of the TECP (JOIDES Journal XV, 3 October 1989) for the 90's: **to investigate the dynamics of the extension collapse of collisional ridges resulting in the formation of arc-shaped orogenic belts....**"

"....**To examine the Neogene history of Atlantic-Mediterranean sea-level oscillations, water exchange and circulation patterns and to investigate the amplification of the climatic signal in marginal ocean basins,** we propose to drill a series of sites in the Gulf of Cadiz and make use of the drill sites proposed for the tectonic objectives in the Alboran Sea. These paleoceanographic targets follow the recommendations defined by Working Group 1 of COSOD II in order to **address changes in the global environment....**"

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000419

ODP Proposal Log Sheet | **395----** | Proposal received: Feb 11, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Post-Breakup Compressional Tectonics on a Passive Volcanic Continental Margin

Abbrev. Title: Compressional tectonics on a passive volcanic margin. General area: North Atlantic

L.O. Boldreel and M.S. Andersen

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Objectives:

LRP: 7, 12/13

1. Correlation between compressional phases and the changes in seafloor spreading geometry.
   - Establish stratigraphic control of marginal compression.
2. Evolution of deep water exchange between Nordic Seas and North Atlantic Ocean.
   - Sampling sediments deposited by deep water currents in the gateway (Faroe Bank Channel).

Specific area: Wyville-Thomson Ridge Complex and Faroe Bank Channel

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
WTC-1	59°55'N/8°29' W	1100	1100		1100	Dating of post-breakup compressional phases.
WTC-2	59°52'N/8°32'W	1150	700		700	As WTC-1.
WTC-3	60°33'N/8°21'W	800	700		700	As WTC-1.
WTC-4	60°33'N/8°21'W	750	1350		1350	As WTC-1.

Proposal acknowledged by JOIDES Office:	Feb 11, 1991	to:	Boldreel, L.O.
Proposal forwarded for review:	Feb 11, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Feb 11, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	(To NARM-DPG in April if warranted by panels.)

000420

Proposal Reference No.: 395----

Title: "Post-Break-up Compressional Tectonics on a Passive Volcanic Continental Margin"

Proponents: L.O. Boldreel, M.S. Andersen

Summary*

"....During studies of the passive continental margins of NW-Europe pronounced post-break-up compressional deformation along the continental margins are found. Some of these compressional structures are located landwards of the ocean continent transition-zone (Hamar and Hjelle, 1984; internal mapping, Geological Survey of Denmark, Faroe Division) and some are associated with the ocean continent transition zone (Masson & Parson, 1983)....."

"....So far the interrelationship between the post-break-up marginal compressional structures and the changes in the geometry of the seafloor spreading has not been treated in a systematic manner. However, close stratigraphic control of the marginal compressional phases is necessary to study the relationship between marginal compressional structures and the changes in seafloor spreading symmetry. It is suggested to establish the stratigraphic control of marginal compression by ODP-drilling within the Wyville-Thomson Ridge Complex....."

"....On the basis of our interpretation (Figs. 3 and 4) we suggest that the Wyville-Thomson Ridge Complex is the result of compression and that the Ymir Ridge and the Wyville-Thomson Ridge are ramp anticlines in connection to a fault plane dipping to the north. The small ridges offset by reverse faults to the south of the complex, which is seen on Fig. 3 are interpreted as foreland thrust folds developed in relation to the tectonic evolution of the Ridge Complex....."

"....The two compression phases coincide with two pronounced changes in the seafloor spreading geometry in the northeast Atlantic Ocean (Nunns, 1983). The first compression took place in the mid Eocene. This corresponds to a change in seafloor spreading from oblique to fan shaped behaviour around the Aegir Ridge. The second compression took place in the lower Miocene and corresponds to a jump of the seafloor spreading axis from the Aegir Ridge to the Kolbensey Ridge. However, according the Larsen (1988) the Reykjanes Ridge and the Aegir Ridge formed a paired propagating/retreating rift system during the time span between the magnetic polarity chrones anomaly 20 and until anomaly 6.

In order to establish a correlation between compression phases and the changes in the geometry of the seafloor spreading it is suggested to drill four wells within the Syville-Thomson Ridge Complex....."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000421

ODP Proposal Log Sheet

396----

Proposal received: Feb 11, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Testing of the Hot-Spot Model for the Origin of Volcanic Passive Continental Margins

Abbrev. Title: Testing hot-spot model for volcanic passive margins. General area: North Atlantic

M.S. Andersen

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Objectives:

LRP

1. Nature of the crust below the seaward dipping reflectors (SDR) and mechanism of VPCM formation. 7
   - Transverse transect across SDR sequence to study possible temporal variations in geochemistry.
   - Longitudinal transect along cont. margin to study spatial geochemical variations related to hot spot.
2. Cenozoic paleoceanography of the North Atlantic. 12/13
   - Subsidence of Greenland-Iceland-Faroe Ridge and its influence on water exchange with Nordic Seas.
   - Drift sediments deposited by deep-water currents; nature of these currents.
   - Correlation of paleoceanographic events and marine biostratigraphy to glacial events.

Specific area: NW of the Faroe Islands; W of Hatton Bank

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
FIR/A-1	62°43'N/7°25'W	580	250	200	450	Sample seaward dipping reflectors for geochem. studies.
FIR/A-2	62°54'N/7°31'W	650	450	200	650	As FIR/A-1.
FIR/B-1	62°48'N/5°25'W	720	950	200	1150	As FIR/A-1; sedimentary succession for paleoceanography.
FIR/B-2	62°53'N/5°10'W	1310	1300	200	1500	As FIR/B-1.
FIR/B-3	62°57'N/5°01'W	1830	1000	200	1200	As FIR/B-1.
ICB/A-1	61°35'N/15°00'W	2200	1000		1000	Old oceanic crust (geochem. variation just after breakup).
ICB/A-2	60°20'N/17°30'W	2600	1000		1000	As ICB/A-1; glacio-volcanic events and paleoceanography.
ICB/A-3	59°00'N/20°40'W	2850	800	50	850	As ICB/A-2.
ICB/A-4	57°06'N/24°00'W	3100	1000		1000	As ICB/A-1.
ICB/B-1	60°10'N/14°15'W	1000	200	100	300	Sample SDRs (Icelandic hot-spot during breakup).
ICB/B-2	59°07'N/18°00'W	1700	250	100	350	As ICB/B-1.
ICB/B-3	57°30'N/20°30'W	2450	400	100	500	As ICB/B-1.

Proposal acknowledged by JOIDES Office: Feb 11, 1991 to: Andersen, M.S.
Proposal forwarded for review: Feb 11, 1991 to: LITHP, OHP, SGPP, TECP
Proposal copies: Feb 11, 1991 to: JOI, SO, SSDB
Proposal forwarded to DPG: 00/00/00 to: (To NARM-DPG in April if warranted by panels.)

000422

Proposal Reference No.: 396----

Title: "Testing of the Hot-Spot Model for the Origin of Volcanic Passive Continental Margins"

Proponent: M.S. Andersen

Summary*

It is proposed here to address the nature of the crust below the seaward dipping reflectors, which characterize volcanic passive continental margins, and the mechanisms responsible for the formation of volcanic passive continental margins. This will be achieved primarily by the study of temporal and spatial variations in the geochemistry of the basalt wedges, which constitute the sequences showing seaward dipping reflectors.

Two fundamentally different, but supplementary, approaches are suggested:

1) Analyze basalts sampled along a transverse transect through the sequence displaying seaward dipping reflectors NW of the Faroe Islands. This would allow study of possible temporal variations in geochemistry.
2) Analyze basalts sampled along a longitudinal transect along the continental margin W of Hatton Bank. This would allow study of spatial geochemical variation, related to the Icelandic hot-spot, in old recognized oceanic crust or alternatively in the basalt wedges.

Important secondary objectives concern the Cenozoic palaeoceanography of the North Atlantic with special emphasis on:

a) the subsidence of the Greenland-Iceland-Faroe Ridge and the influence of this ridge on water exchange between the Nordic Norwegian-Arctic Ocean and the Atlantic Ocean.
b) drift sediments deposited by deep-water currents and information concerning the nature of these deep-water currents, as recorded by the sediments.
c) correlation of palaeoceanographic events and marine biostratigraphy to glacial events.

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000423

ODP Proposal Log Sheet **363-Add** Proposal received: Feb 18, 1991

☐ *New proposal* ☐ *Revised proposal* ☒ **Addendum to proposal** ☐ *"Supplemental Science" Proposal*

Paleoceanographic Record at Proposed Drillsites NR1, NR2, and NR3

Abbrev. Title: Paleoceanographic record at sites NR1, NR2, and NR3. General area: North Atlantic

B. Tucholke

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Objectives:

Objective	LRP
1. N-S shifts in paleoclimatic belts and assoc. current systems at northern edge of main North Atlantic gyre.	13
2. Bathyal to abyssal sedimentary record from about Aptian through the Late Cretaceaous and Cenozoic.	13
• Document the time of initiation of the Western Boundary Undercurrent (WBU).	
• Physical, geochemical, and paleoceanographic effects of the WBUC, which persist to the present.	13
3. Recover complete and undisturbed Cretaceous-Tertiary boundary at then lower bathyal to u. abyssal depths.	
4. Ocean chemistry at shallow depth (<2000m) during mid-Cretaceous anoxia events.	13

Specific area: Southeast Newfoundland Ridge

Proposed Sites: See sites NR1 - NR3 on original proposal 363----.

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives

Proposal acknowledged by JOIDES Office:	Feb 18, 1991	to:	Tucholke, B.E.
Proposal forwarded for review:	Feb 18, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Feb 18, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	(To NARM-DPG in April if warranted by panels.)

Proposal Reference No.: 363-Add

Title: "Paleoceanographic Record at Proposed Drillsites NR1, NR2 and NR3"

Proponents: B.E. Tucholke

Summary*

"....1) The sites are at relatively high latitude (41°N) on the northern edge of the main North Atlantic gyre. They consequently lie at a sensitive paleoceanographic boundary, being affected from the south by the Gulf Stream and from the north by the Labrador current. Sediments deposited in this area should record north-south shifts in paleoclimatic belts and the associated current systems.

2) The sediments are expected to be carbonate-rich and to provide a stratigraphic record extending from about Aptian time through the Late Cretaceous and Cenozoic. It is thought that the crest of the Southeast Newfoundland Ridge was at sea level in Barremian-Aptian time; it has subsequently subsided to its present seafloor depth of 3000-3300 meters. The sites thus should exhibit a bathyal to upper abyssal sedimentary record...."

"....3) There is an excellent opportunity to recover the complete and undisturbed Cretaceous-Tertiary boundary. The boundary at the NR sites would have been at lower bathyal to upper abyssal depths at the time, and could strongly reflect oceanographic changes related to the K/T event. Although the boundary was recovered at Site 384, it may have been disturbed by the rotary drilling technique used at that time. An intact K/T boundary from the North Atlantic would provide valuable information on possible markers and effects that relate to current K/T extinction hypotheses.

4) Penetration of Albian-Turonian sediments above the "U" unconformity (Aptian) which occurs at the basement surface will provide critical information on ocean chemistry at shallow depths (<2000m) during the mid-Cretaceous ocean anoxia events. This age/depth interval currently is very poorly sampled...."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000425

ODP Proposal Log Sheet 397----

Proposal received: Feb 20, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Mantle Plume Interaction With Melting During Lithospheric Extension — Multiple Rifting in the Tertiary North Atlantic Region

Abbrev. Title: Mantle plume and multiple rifting, North Atlantic.

General area: North Atlantic

J. Skogseid, S.T. Gudlaugsson, T. Prestvik and K. Gunnarsson

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Objectives:

LRP

1. Provide stratigraphic and petrological data for testing geodynamic models of volcanic margin formation.
   • W. Jan Mayen Margin: changing conditions from first to second rift phase influenced by Iceland Plume.
2. Probe the synrift sequence.
3. Test, wether or not igneous rocks emplaced at passive margins are able to solve questions concerning:
   • plume influence
   • different pressure release melting functions
   • melt formation
   • emplacement models

Specific area: West Jan Mayen Margin

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
JMR 1	0/0	1860	940		940	Sampling of syn- and post-rift sedimentary sequences.
JMR 1A	0/0	910	680		680	Alternate to JMR 1.
JMR 2	0/0	2170	510		950	Sampling of opaque reflector.
JMR 3	0/0	1960	315		315	Sampling of seaward dipping reflector sequence.
JMR 4	0/0					Sampling of oceanic crust.

Proposal acknowledged by JOIDES Office on: Mar 6, 1991
Proposal forwarded for review to: LITHP, OHP, SGPP, TECP on: 04/01/91
Proposal copies to: JOI, SO, SSDB
Detailed Planning Group Assistance:
Proposal forwarded to DPG: 00/00/00

000426

Proposal Reference No.: 397----

Title: "Mantle Plume Interaction with Melting during Lithospheric Extension. Multiple Rifting in the Tertiary North Atlantic Region: An ODP Proposal for Drilling Volcanic Margins of Different Age"

Proponents: J Skogseid, S.T. Gudlaugsson, T. Prestvik and K. Gunnarsson

Summary*

"....The primary objective is to provide stratigraphic and petrological data for testing geodynamic models of volcanic margin formation.

In this context, the special significance of the West Jan Mayen Margin lies in the fact that it records the second of two rift phases influenced by the Iceland Plume. The fact that the structure and development of the resulting volcanic margin in some respects differs from that of the volcanic margins generated in the first phase indicates that some of the initial conditions changed from the first to the second rift phase.

Modeling of the different responses recorded by the volcanic margins formed during the two phases will help constrain model parameters.

The uniform stretching - pressure release melting model predicts both vertical movements, melt volume and composition in a quantitative manner. The differences should be explicable by different asthenospheric temperatures in the two rift phases. If significant discrepancies between model predictions and observations are found, the data obtained may indicate necessary modifications to the model and also allow comparison with alternative, less quantitative, models such as the secondary convection and active plume models. Since the first and second rift phases supposedly correspond to the initial and steady-state stages of the Iceland Plume, respectively, comparative modeling of the two types of margin generated should reveal effects of active plume involvement if those are present.

A secondary objective is to probe the synrift sequence. We cannot hope to fully understand volcanic margin development without calibrated geological sections through the synrift sequence, both volcanic and sedimentary. To our knowledge there are no calibrated sections of a volcanic margin synrift sequence available at present. By drilling at the West Jan Mayen Margin the length of the rift phase and the timing of fault movements relative to magmatism may be determined.

A third objective is to test, whether or not, igneous rocks emplaced at passive margins are able to help solving fundamental questions concerning plume influence, different pressure release melting functions, melt formation and emplacement models. In order to achieve this the succession of igneous rocks formed at different geological times should be sampled and the geochemical components systematically compared. In order to get a sound basis for the study, selected samples of volcanic rocks should be subjected to precision $^{40}Ar/^{39}Ar$ (Baksi, 1987; 1990) or K/Ar dating (Levi et al., 1990) in order to obtain the best possible control of time relations between sites and between the Vøring and the West Jan Mayen margins...."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000427

ODP Proposal Log Sheet **398----**

Proposal received: Feb 22, 1991

☒ New proposal ☐ *Revised proposal* ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

Proposal for ODP Investigation of Quaternary Paleoceanography Near the Interface of the Gulf Stream and Labrador Current off the Grand Banks of Newfoundland

Abbrev. Title: Quat. Paleoceanography, Grand Banks, Newfoundland. General area: North Atlantic

D.J.W. Piper, P.J. Mudie and A.E. Aksu

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Objectives:

LRP 12/13

Late Neogene paleoceanography and glacial history.

- Intermediate water formation in the western N. Atlantic and role of SE Newfoundland ridge as barrier.
- Frontal cyclogenesis at Gulf Stream - Labrador Current boundary.
- Intensification of WBUC flow and relationship to paleocirculation.
- Record of sediment discharge from Laurentide ice sheet through Gulf of St Lawrence.

Specific area: Fogo and Newfoundland seamounts

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
FSQ-1	42°18.0'N/53°00.0'W	3140	280		280	Paleoceanographic transect, glacial denudation.
FSQ-2	41°31.0'N/51°20.0'W	3370	170		170	Paleoceanographic transect, glacial denudation.
FSQ-2a	41°22.3'N/51°02.6'W	3730	170		170	Alternate to FSQ-2.
NSQ-1	43°58.0'N/46°33.2'W	3868				Intermediate water; sed. transport by Labrador Current.

Proposal acknowledged by JOIDES Office on: Mar 6, 1991
Proposal forwarded for review to: LITHP, OHP, SGPP, TECP on: Apr 1, 1991
Proposal copies to: JOI, SO, SSDB
Detailed Planning Group Assistance:
Proposal forwarded to DPG: 00/00/00

000428

Proposal Reference No.: **398----**

Title: "Proposal for ODP Investigation of Quaternary Paleoceanography Near the Interface of the Gulf Stream and Labrador Current off the Grand Banks of Newfoundland" A proposal to add on to or modify the proposed programs to investigate plume volcanism (363A: Tucholke et al., 1990) and conjugate margins (359A, Austin et al., 1990)

Proponents: D.J.W. Piper, P.J. Mudie and A.E. Aksu

Abstract

This proposal is for high-resolution sampling of seamount Neogene-Quaternary sections in the northwest Atlantic. Two sites are proposed as alternate sites to those in proposal 363A and two additional sites as add-ons to 363A and 359A. These sites address the following issues:

1. Late Neogene history of intermediate water formation in the western North Atlantic and the role of the Southeast Newfoundland Ridge in blocking the penetration of such intermediate waters to the Central Atlantic Ocean (OHP).
2. Late Neogene history of frontal cyclogenesis at the Gulf Stream-Labrador Current boundary (OHP).
3. Late Neogene history of intensification of WBUC flow and relationship to paleocirculation (OHP, SGPP).
4. Late Neogene record of sediment discharge from the Laurentide ice sheet (SGPP).

ODP Proposal Log Sheet **361-Rev** Proposal received: Mar 1, 1991

☐ *New proposal* ☒ **Revised proposal** ☐ *Addendum to proposal* ☐ *"Supplemental Science" Proposal*

A Proposal for Drilling an Active Hydrothermal System on a Slow-Spreading Ridge: MAR 26°N (TAG)

Abbrev. Title: Active hydroth. system, slow-spread. ridge, MAR 26°N. General area: North Atlantic

G. Thompson, S.E. Humphris, M.K. Tivey, K.M. Gillis, W.B. Bryan, R.P. Von Herzen, M.C. Kleinrock, M.A. Tivey, H. Schouten, P.A. Rona, J.R. Cann, J. Honnorez, M. Hannington, J. Franklin, S. Scott and P. Herzig

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Objectives: LRP

1. Nature and distribution of deposits in near surface discharge zone; dynamics and phys. characteristics of flow. 10
   - Controls on flow rates and residence times in active mound
   - Physical and chemical properties of fluid in mound; evaluation of need to require samples from interior
   - Physical properties (permeability, porosity) of mound controlling hydrology
   - Processes to distribute various mineralogies (dissolution, precipitation, mixing and cooling of fluids)
   - Processes and rates at mound margins causing enrichment of metals such as Au, destr. of sulfides etc.
2. Nature/distribution of subseafloor mineralization in stockwork and root zone; charact. of circulating fluid. 10
   - Minerals and their processes of form. in stockwork; re-equilibration, reaction, mobiliz. of metals; etc.
   - Fluid composition and flow rates in discharge pipe; adiabatic cooling? 2-fluid mixing? etc.
   - Analogy of ridge hydrothermal systems to ophilitic stockwork zones
3. Nature and characteristics of the reaction zone. 10
   - Location of reaction zone (sheeted dikes, volcanics, plutonics); structural control? permeability, porosity?
   - Type and degree of rock alteration: greenshist assembl., epidosites, rel. fresh, pervasively altered? etc.
   - Chemical composition and physical properties of reaction fluid; does phase separation occur?
   - What is the magnetization of the reaction zone?
4. Nature and characteristics of the recharge zone. 10
   - How is host rock modified by reation with circ. fluids? Are metam. boundaries abrupt or gradational?
   - Permeability structure of recharge zones? relationship between perm. and metamorphic boundaries?
   - How is comp. of seawater modified as it migrates down into the crust? heat/mass transfer in early stage?

Specific area: TAG Hydrothermal Mound, Mid-Atlantic Ridge

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
PRIO 1A	26°08'N/044°49'W	3700		300	300	Deposits and flow in near surface discharge zone.
PRIO 1B	26°08'N/044°49'W	3700		300	300	As PRIO 1A.
PRIO 1C	26°08'N/044°49'W	3700		300	300	AS PRIO 1A.
PRIO 2	26°08'N/044°49'W	3700		600	600	Subseafloor (stockwork/root zone) mineralization and flow.
PRIO 3	26°08'N/044°49'W	3700		2000	2000	Nature and characteristics of reaction zone.
PRIO 4	26°08'N/044°49'W	3700		1000	1000	Nature and characteristics in recharge zone.

000430

Proposal acknowledged by JOIDES Office:	Mar 6, 1991	to:	Thompson, G.
Proposal forwarded for review:	Apr 1, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Apr 1, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

Proposal Reference No.: 361-Rev

Title: "A Proposal for Drilling an Active Hydrothermal System on a Slow-Spreading Ridge: MAR 26°N (TAG)"

Proponents: G. Thompson, S.E. Humphris, M.K. Tivey, K.M. Gillis, W.B. Bryan, R.P. Von Herzen, M.C. Kleinrock, M.A. Tivey, H. Schouten, P.A. Rona, J.R. Cann, J. Honnorez, M. Hannington, J. Franklin, S. Scott and P. Herzig

Summary*

"....Although a considerable amount of surficial sampling has been completed on a number of ridge hydrothermal systems, many questions (discussed in a later section) remain that can be answered only by drilling an active system on a mod-ocean ridge. Hydrothermal systems on unsedimented ridge axes dominate global hydrothermal activity, and hence are a major contributor to global mass and energy fluxes. Until now, a major focus of ODP has been to drill sedimented ridge hydrothermal systems where large deposits have or are developing. However, it has been emphasized (e.g., by the Sedimented Ridges Working Group) that they represent special cases, and there is a need to drill a large volcanic-hosted deposit. It is from the interior of such mature deposits that we will be able to study the processes of recrystallization and 'zone-refining'.

The TAG area at 26°N (Fig. 1) on the Mid-Atlantic Ridge has many features that make it a prime target for drilling.

1. It is a slow-spreading environment—a major characteristic of the global rift system.
2. It is located in the central part of a ridge segment bounded by small non-transform offsets, typical of many such segments on slow spreading ridges.
3. The unsedimented, volcanic-hosted deposit in a water depth of 3700 m is large—the presently active mound is approximately 200 m in diameter and 50 m in height. It is composed of massive sulfides probably in excess of 5 X 10^6 tons; equivalent in size to some of the deposits in the Cyprus, Oman and other ophiolites.
4. It exhibits a wide range of polymetallic sulfides with predominantly Fe-Cu-Zn varieties. A recent series of *Alvin* dives indicates the mound is zones, both in terms of type of activity and mineralogy. There is also evidence of supergene reactions resulting in enrichment in metals such as gold.
5. Exiting hydrothermal solutions range from high (363°C), through medium to low temperatures at the boundaries of the active mound. These fluids are somewhat different from EPR fluids (Campbell *et al.*, 1988) and show interaction with weathered crust. This may be a feature of slow-spreading ridges which can be tested by drilling.
6. The deposit is mature—geochronological studies indicate the mound to be of the order of 40-50,000 years old, and to have undergone intermittent activity, possibly every 5-6,000 years over the last 20,000 years. Duration of an active cycle still has to be resolved but the present day activity is, at least, 50 years duration based on radiometric dating.
7. The mound represents a good drill target—the combination of size and maturity argues for a large surface areal target, with a well-developed root zone.
8. The active mound is part of widespread activity over a 10 X 10 km area. Waning and relict sulphide mounds have been located nearby, and low temperature activity with precipitation of Fe and Mn oxides and Fe silicates has been documented a few km away higher up the axial valley wall. Insight into the regional tectonics, and the size, frequency and controls of hydrothermal cells in this environment, will be an important by-product of the site surveying.

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

000431

ODP Proposal Log Sheet

S-2

Proposal received: Mar 20, 1991

☐ *New proposal* ☐ *Revised proposal* ☐ *Addendum to proposal* ☒ **"Supplemental Science" Proposal**

Downhole Measurements in Jurassic Oceanic Crust of Hole 801C

Abbrev. Title: Downhole measurements Jurassic crust, Hole 801C. General area: Northwestern Pacific

R.L. Larson, R. D. Jarrard and A.T. Fisher

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Objectives:

LRP: 10

Downhole measurem. at Hole 801C, to characterize missing end-member oceanic crust: old and fast-spread.

- geophysical (seismic-strat. and litho-porosity) to access physical state of upper crust
- strings/temperature
- packer measurements to assist in determining bulk permeability and other hydrogeological properties
- geochemical logging string to provide continuous record of major and minor element geochemistry
- FMS and BHTV to provide resistivity and acoustic images of borehole wall
- magnetometer to assist in rock- and paleomagnetic interpretations

Specific area: Pigafetta Basin

Proposed Sites:

Site Name	Position	Water depth	Penetration Sed	Bsmt	Total	Brief site-specific objectives
801C	18°38.5'N/156°21.6'E	5674	453	131	584	Downhole measurements.

Proposal acknowledged by JOIDES Office:	Mar 22, 1991	to:	Larson, R.L.
Proposal forwarded for review:	Apr 1, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Apr 1, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000432

Proposal Reference No.: S-2

Title: "JOIDES Supplemental Science Proposal — Downhole Measurements in Jurassic Oceanic Crust of Hole 801C"

Proponents: R.L. Larson, R.D. Jarrard and A.T. Fisher

Abstract*

We propose an ODP supplemental science program consisting of 3.3 days on site to conduct downhole measurements in the Earth's oldest in-situ oceanic crust at Hole 801C in the northwestern Pacific. This site lies along a transit between guyot sites proposed by the Atolls and Guyots Detailed Planning Group, so only six hours of additional transit time is necessary. The principle goal of the proposed program is to characterize the hydrogeology, structure, chemistry, and physical properties of an end-member of crustal evolution, old oceanic crust (158-165 Ma) formed at a fast spreading half-rate (8-10 cm/yr). The Japanese three-component magnetometer will help to determine if the Jurassic magnetic quiet zone is due to atypical crustal magnetization. Downhole measurements may also elucidate the state of stress in this old portion of the Pacific plate for the first time.

No logging or other downhole measurements were made in the basement section of Hole 801C during ODP Leg 129, although the sediment section was logged in the pilot hole, 801B. Hole 801C is cased and cemented to basement, and the 131 m basement section is stable and clean. The time necessary on site is relatively easy to predict, and the probability for successful measurements is high.

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

ODP Proposal Log Sheet **346-Add**

Proposal received: Mar 25, 1991

☐ *New proposal* ☐ *Revised proposal* ☒ **Addendum to proposal** ☐ *"Supplemental Science" Proposal*

Complementary Information on Data Status on A Proposal for Scientific Drilling on the Equatorial Atlantic Transform Margin

Abbrev. Title: Complementary information on data status

General area: Eastern equatorial Atlantic

J. Mascle

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FAX: 33 (93) 763-766

Objectives: See 346-Rev

LRP

Specific area: Ivory Coast margin

Proposed Sites: See 346-Rev

Site Name	Position	Water depth	Penetration Sed Bsmt Total	Brief site-specific objectives

Proposal acknowledged by JOIDES Office:	Mar 29, 1991	to:	Mascle, J.
Proposal forwarded for review:	Apr 1, 1991	to:	LITHP, OHP, SGPP, TECP
Proposal copies:	Apr 1, 1991	to:	JOI, SO, SSDB
Proposal forwarded to DPG:	00/00/00	to:	

000434

Proposal Reference No.: **346-Add**

Title: **"Complementary Informations on Data Status for a Proposal for Scientific Drilling on the Equatorial Atlantic Transform Margin"**

Proponent(s): J. Mascle, et al.

Summary*

"....As indicated within the proposal submitted during summer 89, a complementary set of data has been obtained on the Ivory Coast-Ghana transform margin. These data are of two types:

- Multichannel seismic reflection profiles;
- Seismic refraction data.

Both data have been recorded on the same lines in order to better study the sedimentary cover and crustal structure. The data concern four main target areas:

(1) Regional lines across the shallow portion of margin (i.e., Ghana);
(2) Regional lines across the deep margin and particularly the Ivory Coast-Ghana ridge;
(3) Regional lines across the adjacent oceanic crust;
(4) Finally data recorded nearby previously proposed drilling sites...."

"....Summary of Data Available for the Ivory Coast-Ghana Transform Margin

- General regional bathymetry (contour lines 100m) (Figure 13)
- Detailed seabeam bathymetry on two areas of the deep margin (contour internal 10 or 20m) (Figure 14)
- Magnetic and gravimetry data on two areas of deep margin (Figure 15)
- Single channel seismic lines at regional scale (entire margin) (Figure 16)
- Detailed single channel seismic lines on two areas of the deep margin (Figure 17)
- Multichannel seismic lines of the 1990 French cruise (Figure 1)
- Refraction data of the French 1990 and 1991 U.K. cruises (Figure 12)

Note that a deep sea diving cruise is expected for 1992-1993 along several segments of the continental slopes (Figure 18)...."

*In cases proponents do not submit an abstract or summary, the JOIDES Office extracts part(s) of the proposal for this purpose (indicated as ".... ....").

LISTING OF PROPOSALS

Revised: 9/11/90

A: Atlantic; B: Indian; C: Southern; D: Western Pacific; E: Central and Eastern Pacific; F: Instrumental &Miscell.

JOIDES No	Title	Proponents	Country	Date
71	[idea proposal]	-	-	-
1/A	Pre-m. Cretac. history of SE Gulf of Mexico	Phair & al.	US	12/82
2/E	Middle America trench and Costa Rica margin	Crowe & al.	US	12/82
4/E	Tuamoto Archipelago (French Polynesia)	Okal & al.	US	6/83
5/A	Struc. & sedim. carbonate platforms	Mullins & al.	US	7/83
7/A	Gulf of Mexico & Yucatan	Buffler & al.	US	8/83
8/E	Southern Chile trench	Cande	US	9/83
9/A	Pre-Messinian hist. of the Mediterranean	Hsu & al.	ESF	1/84
11/A	Porto & Virgo seamounts, Iberian margin	Kidd & al.	UK/FR	1/84
12/A	Tyrrhenian back-arc basin transect	Cita & al.	ESF	1/84
13/F	Water column research lab	Wiebe	US	1/84
14/E	Zero age drilling: EPR 13°N	Bougault	FR	1/84
15/A	Formation of the Atlantic Ocean	Herbin	FR	1/84
16/A	Atlantic-Mediterranean relationship	Faugeres	FR	1/84
17/A	Gorringe Bank, deep crust & mantle	Mevel	FR	1/84
19/A	Eleuthera fan, Bahamas	Ravenne & al.	FR	1/84
20/A	Subduction collision: Outher Hellenic Arc	J.Mascle	FR	1/84
22/A	Rhone deep sea fan	Bellaiche & al.	FR	1/84
23/A	Carribean basins	A.Mascle & al.	FR	1/84
24/A	Barbados transects	A.Mascle & al.	FR	1/84
25/D	New Hebrides arc	ORSTOM team	FR	1/84
28/D	South China Sea	Letouzey & al.	FR	1/84
29/D	Ryukyu Island & Okinawa backarc basin	Letouzey	FR	1/84
31/B	Red Sea, paleoenvironmental history	Guennoc	FR	1/84
32/A	Yucatan basin	Rosencrantz & al.	US	1/84
33/A	Mediterranean drilling [same as 9/A]	Hsu	ESF	1/84
35/A	Barbados ridge accretionary complex	Westbrook	UK	2/84
38/A	Gulf of Mexico (DeSoto Canyon)	Kennett & al.	US	2/84
39/A	Cape Verde drilling	Hill	UK	2/84
40/A	Logging of site 534 (Blake-Bahamas basins)	Sheridan & al.	US	2/84
34/E	Pacific-Aleutian-Bering Sea (Pac-A-Bers)	D.W. Scholl & al.	US	3/84
41/A	N Barbados forearc: Struc. & hydrology	C.Moore	FR/US	3/84
42/D	Sunda Straits area	Huchon	FR	3/84
43/D	SW Pacific drilling outline	Falvey	AUS	3/84
44/B	Andaman Sea: Tectonic evolution	Peltzer & al.	FR	3/84
45/A	Equatorian Atlantic: Paleoenvironment	Ruddiman	US	3/84
47/D	Manila trench, S.China Sea	Lewis & al.	US	3/84
49/D	Eastern Banda arc/Arafura Sea	Schluter & al.	G	3/84
52/D	Solomon Sea	Milsom	AUS	3/84
53/F	Vertical Seismic Profiling	Phillips & al.	US	3/84
54/C	Sub-Antarctic & Weddell Sea sites	Kennett	US	3/84
55/B	Makran forearc, Pakistan	Leggett	UK	3/84
57/B	Deformation of African-Arabian margin	Stein	US	3/84
58/A	West Baffin Bay	Grant & al.	CAN	3/84
59/A	Continental margin instability testing	Weaver & al.	UK	3/84
60/A	Newfoundland basin: E. Canadian margin	Masson	UK	4/84
6/A	Labrador Sea, ocean crust & paleoceanogr.	Gradstein & al.	CAN	5/84
36/A	Norwegian Sea	Hinz & al.	G	5/84
18/A	Off Galicia Bank	Mauffret & al.	FR	6/84
63/A	Madeira abyssal plain	E.J.T. Duin & al.	NETH	6/84
64/A	Site NJ-6	Poag	US	6/84
67/D	Tonga-Lord Howe Rise transect	Falvey & al.	AUS	7/84

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A: Atlantic; B: Indian; C: Southern; D: Western Pacific; E: Central and Eastern Pacific; F: Instrumental &Miscell.

JOIDES No	Title	Proponents	Country	Date
68/A	Deep basins of the Mediterranean	L.Montadert	FR	7/84
69/F	Rock stress meas. in part of Norwegian Sea	Stephansson	ESF	7/84
70/F	Borehole seismic experim. at 417 & 603	Stephen & al.	US	7/84
72/A	Two-leg transect on Lesser Antilles forearc	Speed & al.	CONSOR.	7/84
37/E	Costa Rica, test of duplex model	Shipley & al.	US	8/84
74/A	Continental margin of Morocco, NW Africa	Winterer & al.	US	8/84
75/E	Gulf of California	K.Becker & al.	US	8/84
77/B	Seychelles bank & Amirante trough	Mart	US	8/84
78/B	Indus fan	Kolla	US	8/84
79/B	Tethyan stratigraphy & oceanic crust	Coffin & al.	US	8/84
81/A	Ionian Sea transect, Mediterranean	Hieke & al.	G	9/84
82/D	Sulu Sea	Thunell	US	9/84
84/E	Peru margin	Kulm & al.	US	9/84
85/A	Margin of Morocco, NW Africa	D.Hayes & al.	US	9/84
56/B	Intraplate deformation	Weissel et al.	US	10/84
61/B	Madagscar & E Africa conjugate margins	Coffin & al.	US	10/84
65/B	S. Australian margin: Magnetic quiet zone	Mutter & al.	US	10/84
80/D	Sunda & Banda arc	Karig & al.	US	10/84
87/B	Carlsberg Ridge, Arabian Sea: Basalt obj.	J.Natland	US	10/84
90/B	SE Indian Ocean Ridge transect	Duncan	US	10/84
91/B	SE Indian Ocean Oceanic Crust	Langmuir	US	10/84
93/B	W Arabian Sea: upwelling, salinity etc.	Prell	US	10/84
94/B	Owen Ridge: History of upwelling	Prell	US	10/84
95/B	Asian monsoon, Bay of Bengal	D.Cullen & al.	US	10/84
96/B	Bengal Fan (Indus & Ganges Fans)	Klein	US	10/84
98/B	History of atmosph. circ. (Austral. desert)	D.Rea	US	10/84
99/B	Agulhas Basin paleoceanogr. clim. dynamics	W.Coulbourn	US	10/84
100/B	SE Indian Ridge transect: Stratigr. section	J.Hays & al.	US	10/84
101/B	Ridge crest hydrothermal activity	Owen & al.	US	10/84
102/B	Somali Basin	Matthias	US	10/84
103/B	Laxmi Ridge, NW Indian Ocean	Heirtzler	US	10/84
104/B	90° E Ridge transect	Curray & al.	US	10/84
105/B	Timor, arc-continent collision	Karig	US	10/84
106/B	Broken Ridge, Indian Ocean	Curray & al.	US	10/84
107/B	SE Indian Ridge: Stress in ocean lithosph.	Forsyth	US	10/84
108/C	E. Antarctic continental margin (Prydz Bay)	SOP-Kennett	US	10/84
109/C	Kerguelen - Heard Plateau	SOP-Kennett	US	10/84
110/C	Wilkesland - Adelie continental margin	SOP-Kennett	US/FR	10/84
111/C	SE Indian Ocean Ridge transect (subantarc.)	SOP-Kennett	US	10/84
112/B	Lithosphere targets	SOP-Kennett	US	10/84
113/B	Agulhas Plateau	SOP-Kennett	?	10/84
114/C	Crozet Plateau	SOP-Kennett	FR	10/84
117/B	Northern Red Sea	Cochran	US	10/84
118/B	Cenozoic history of E. Africa	Kennett & al.	US	11/84
76/E	Proposal for axial drilling on the EPR at 13°N	R. Hekinian & al	FR	11/84
62/B	Davie Fracture Zone	Coffin & al.	CONSOR.	12/84
119/B	Early opening of Gulf of Aden	Stein	US	12/84
120/B	Red Sea, Atlantis II deep	Zierenberg & al.	US	12/84
122/A	Kane fracture zone	Karson	US	12/84
123/E	Studies at site 501/504	Mottl	US	12/84
124/E	To deepen Hole 504B	LITHP-K.Becker	US	1/85
125/A	Bare-rock drilling at the Mid-Atl. Ridge	Bryan & al.	US	1/85

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JOIDES No	Title	Proponents	Country	Date
126/D	Drilling in the Australasian region	Crook & al.	AUS	1/85
127/D	E Sunda arc & NW Austral. collision	Reed & al.	US	1/85
128/F	Phys.props. in accretionary prisms	Karig	US	1/85
130/D	Evolution of the SW Pacific (N of New Zeal.)	J.Eade	NZ	1/85
131/D	Banda Sea basin: Trapped ocean crust etc.	Silver	US	3/85
132/D	TTT-Type triple junction off Bosco,Japan	Ogawa & al.	J	3/85
133/F	In-situ sampling of pore fluids	McDuff & al.	US	3/85
135/B	Broken Ridge: Thermo-Mechanical Models	Weissel & al.	US/UK	3/85
10/A	Cenozoic circulation off NW Afric	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	7/85
153/E	Three sites in the SE Pacific	J.Hays	US	7/85
154/D	Banda-Celebes-Sulu basin entrapment	Hilde	US	7/85
156/D	Kita-Yamam. trough, Japan Sea: Massive sulf.	Urabe	J	7/85
157/D	Japan Sea paleoceanography	Koizumi & al.	J	7/85
158/D	Japan Sea & trench: Geochem & sedimentol.	Matsumoto & al.	J	7/85
159/F	Phys.cond. across trench: Izu-Mariana-...	Kinoshita & al.	J	7/85
160/F	Geophys. cond. of lithosp. plate, Weddell Sea	Kinoshita & al.	J	7/85
161/F	Magn.field & water flow measurement	Kinoshita & al.	J	7/85
162/F	Offset VSP on the SW IO Ridge fract.zones	Stephen	US	7/85
164/D	Japan trench & Japan-Kuril trenches juntion	Jolivet & al.	FR	7/85
165/D	Shikoku basin ocean crust	Chamot-Rooke & al.	FR	7/85
166/D	Japan Sea: Evolution of the mantle wedge	Tatsumi & al.	J	7/85
168/D	Japan Sea: Sedim. of siliceous sediments	Iijima & al.	J	7/85
169/C	South Tasman Rise	Hinz & al.	G	7/85
170/D	Valu Fa Ridge, Lau Basin: Back-arc spread.	Morton & al.	US	7/85
30/B	Davie Ridge & Malagasy margin, Indian Ocean	Clocchiatti & al.	FR	8/85
50/D	Nankai trough & Shikoku forearc	Kagami & al.	J	8/85
73/C	Antarctic margin off Adelie coast	Wannesson & al.	FR	8/85
92/B	Crozet Basin, seismic observatory	Butler & al.	US	8/85
137/B	Fossil ridges in the Indian Ocean	Schlich & al.	FR	8/85
138/B	Rodrigues triple junction, Indian Ocean	Schlich & al.	FR	8/85
139/B	Agulhas Plateau, SW Indian Ocean	Jacquart & al.	FR	8/85
140/B	Central & N. Red Sea axial areas	Pautot & al.	FR	8/85
141/B	Indus Fan	Jacquart & al.	FR	8/85
172/D	Mariana forearc, arc & back-arc basin	P.Fryer	US	8/85
173/B	Seychelles, Mascarene Pl., NW Indian Ocean	Patriat & al.	FR	8/85
174/D	Japan Sea: Forearc tectonics	Otsuki	J	8/85
175/D	Japan Trench: Origin of Inner Wall	Niitsuma & al.	J	8/85
176/D	S.Japan Trench: Migration of Triple Junction	Niitsuma	J	8/85

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JOIDES No	Title	Proponents	Country	Date
178/D	Nankai trough forearc	Shiki & al.	J	8/85
180/D	N.Philippines Sea: Kita-Amami basin & plat.	Shiki	J	8/85
181/D	Izu-Ogasaw.-Mariana forearc:Crust & mantle	Ishii	J	8/85
182/E	Sounder Ridge,Bering Sea: Stratigraphy	A. Taira	J	8/85
184/D	Papua New Guinea/Bismark Sea Region	N.Exon & al.	AUS/US	8/85
185/C	Kerguelen Plateau: Origin, evol. & paleo.	Coffin & al.	AUS	8/85
186/F	SW Ind.Ocean fracture zones hydrology etc.	von Herzen	US	8/85
86/B	Red Sea	Bonatti	US	9/85
187/D	New Hebrides arc region, SW Pacific	F.Taylor & al.	US	9/85
188/F	395A boreh.geophys. & 418A drill.& geophysics	M.Salisbury	CAN	9/85
189/D	Tonga Ridge and Lau Ridge Region	A.Stevenson & al.	US	10/85
191/D	Solomon Isl.: Arc-plateau coll. & intra arc	Vedder & al.	US	10/85
192/E	Baranoff fan, SE Gulf of Alaska	Stevenson & al.	US	10/85
193/F	Upper ocean partic.fluxes in Weddell Sea	Biggs	US	11/85
3/E Rev/1	Flexural moat, Hawaiian Islands	A.B. Watts & al	US	11/85
143/F	In-situ magnet. susc. measurements	Krammer & al.	G	12/85
195/E	Paleoenv. & Paleoclim. in the Bering Sea	C. Sancetta & al.	US	12/85
196/B	90°E Ridge: Impact of India on Asia	J.Peirce	CAN	12/85
197/B	Otway Basin/W.Tasman region	Wilcox & al.	AUS	12/85
198/D	Ulleung Basin: Neogene tectonics & sedim.	Chough & al.	COREA	12/85
199/E	Pelagic sediments in the sub Artic gyre (N.Pacific)	T.R. Janecek & al.	US	12/85
200/F	Borehole magnet. logging on leg 109 (MARK)	Bosum	G	12/85
201/F	High-precision borehole temp. measurements	Kopietz	G	12/85
205/A	Bahamas: Carb.fans, escarpm.erosion & roots	Schlager & al.	ESF	12/85
202/E	N.Marshall Isl. carbonate banks	S.O. Schlanger	US	1/86
203/E	Guyots in the central Pacific	E.L. Winterer & al.	US	1/86
207/E	Bering Sea basin & Aleutian ridge tectonics	Rubenstone	US	1/86
208/B	Ancestral triple junction, Indian Ocean	Natland & al.	US	1/86
209/C	Eltanin fracture zone	Dunn	US	1/86
210/E	NE Gulf of Alaska: Yakutat cont. margin	Lagoe & al.	US	1/86
211/B	Deep stratigraphic tests	SOHP -Arthur	US	1/86
212/E	Off northern & central California	Greene	US	1/86
213/E	Aleutian subduction: accret. controlling p.	McCarthy & al.	US	1/86
214/E	Central Aleutian forearc:Trench-slope break	Ryan & al.	US	1/86
215/B	Red Sea: Sedim. & paleoceanogr. history	Richardson & al.	US	2/86
216/D	South China Sea	Rangin & al.	FR	2/86
217/D	Lord Howe Rise	Mauffret & al.	FR	2/86
218/D	Manila trench & Taiwan collis.zone, SCS	Lewis & al.	US	2/86
219/B	Gulf of Aden evolution	Simpson	UK	3/86
220/D	Three sites in the Lau Basin	J. Hawkins	US	3/86
222/E	Ontong-Java Pl.: Origin, sedim. & tectonics	Kroenke & al.	US	3/86
221/E	Equatorial Pacific: late Cenoz. Paleoenv.	N.G. Pisias	US	3/86
83/D	Izu-Ogasawara (Bonin) arc transect	Okada & al.	J	4/86
134/B	Gulf of Aden	Girdler	UK	4/86
171/D	Bonin region: Intra-oceanic arc-trench dev.	B.Taylor	US	4/86
223/B	Central Indian Ocean fracture zone	Natland & al.	US	4/86
225/E	Aleutian Basin, Bering Sea	A.K.Cooper & al.	US	4/86
224/E	Escanaba Trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	4/86
89/B	SWIR, mantle heterogeneity	Dick & al.	US	5/86
121/B	Exmouth & Wallaby Pl. & Argo Abyssal Plain	U.von Rad & al.	G/AUS	5/86
129/C	Bounty trough	Davey	NZ	5/86
227/E	Aleutian Ridge, subsidence and fragment.	Vallier & al.	US	5/86

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JOIDES No	Title	Proponents	Country	Date
228/C	Weddell Sea (E Antarctic contin. margin)	Hinz & al.	G	5/86
229/E	Bering sea, Beringian conti. slope & rise	A.K. Cooper & al.	US	5/86
230/C	Wilkes Land margin, E Antarctica	Eittreim & al.	US/J	5/86
231/E	North Pacific magnetic quiet zone	Mammerickx & al.	US	5/86
232/E	N.Juan de Fuca R.: High temp.zero age crust	E.Davis & al.	CAN	5/86
26/D	Tonga-Kermadec arc	Pelletier & al.	FR	6/86
144/D	Kuril forearc off Hokkaido: Arc-arc collis.	Seno & al.	J	6/86
145/D	Ryukyu arc: Left-lateral dislocation	Ujiie	J	6/86
148/D	Near TTT-type triple junction off Japan	Ogawa et al.	J	6/86
149/D	Yamoto Basin,Sea of Japan: Active Spreading	Kimura & al.	J	6/86
167/D	Okinawa trough & Ryukyu trench	Uyeda & al.	J	6/86
234/E	Aleutian trench: Kinematics of plate cover.	von Huene & al.	US	6/86
235/D	Solomon Sea: Arc-trench dev., back-arc...	Honza & al.	CONSOR.	6/86
236/E	N.Gulf of Alaska	Bruns & al.	US	6/86
237/E	Active margin off Vancouver Isl., NE Pac.	Brandon & al.	CAN/US	6/86
238/F	Pore pressure in the Makran subduction z.	Wang & al.	US	6/86
239/D	Two sites in the Lau Basin	D.Cronan	UK	6/86
241/E	Gulf of Alaska (Yakutat block) & Zodiak fan	Heller	US	6/86
243/D	Outer Tonga trench	Bloomer & al.	US	6/86
240/B	Argo abyssal Plain	Gradstein	CONSOR.	7/86
245/E	Transform margin of California	Howell & al.	US	7/86
246/B	Mesozoic upwelling off the S.Arabian margin	Jansa	CAN	7/86
247/E	NE Pacific: Oceanogr.,climatic & volc. evol.	D. Rea & al.	US/CAN	7/86
226/B	Equat.Indian Ocean: carb. system & circul.	Prell & al.	US	8/86
244/C	Western Ross Sea	Cooper & al.	US/NZ	8/86
248/E	Ontong-Java Plateau	Ben-Avraham & al.	US	8/86
249/E	Sedimentation in the Aleutian trench	M.B. Underwood	US	8/86
250/E	Navy fan, California borderland	M.B. Underwood	US	8/86
251/B	Seychelles-Mascarene-Saya de Mayha region	S.N. Khanna	SEYCH.	8/86
253/E	Shatsky Rise:Black shales in ancestr. Pac.	S.O. Schlanger & al.	US	8/86
254/A	NW Africa: Black shales in pelagic realm	Parrish & al.	US	8/86
255/A	Black shales in the Gulf of Guinea	Herbin & al.	FR/US	8/86
256/E	Queen Charlotte Transform fault	Hyndman & al.	CAN	9/86
257/E	Farallon Basin, Gulf of California	L. Lawver & al.	US	9/86
204/A	Florida escarpment transect	Paull & al.	US	10/86
252/E Rev.	Loihi Seamount, Hawaii	H. Staudigel & al.	US	10/86
258/E	Stockwork zone on Galapagos Ridge	R. Embley & al	US	10/86
260/D	Ogasawara Plateau, near Bonin arc	T. Saito & al.	J	10/86
261/E	Mesozoic Pacific Ocean	R.L. Larson & al.	US/FR	10/86
262/B	Mid Indus Fan	B.Haq	US	11/86
263/E	S.Explorer Ridge, NE Pacific	R.L. Chase & al.	CAN	11/86
206/D	Great Barrier R.: Mixed carb/epiclast.shelf	Davies & al.	AUS	12/86
264/A	Montagnais impact struct.,Scotia Sh.	Grieve & al.	US	12/86
265/D	Western Woodlark Basin	S.D. Scott & al.	CAN/AUS/PNG	12/86
266/D	Lau Basin	Lau Group	CONSOR.	12/86
267/F	Old crust at converg. margins: Argo & W.Pac	C.H. Langmuir & al	US	12/86
268/D	Hydrothermal ore deposition, Queensland Pl.	Jansa et al.	CAN	12/86
269/E	Aleutian pyroclastic flows in marine envir.	Stix	CAN	12/86
27/D Rev.	Sulu Sea marginal basin	Cl. Rangin & al	FR	1/87
48/D Add.	Sulu Sea transect	Cl. Rangin	G/FR	1/87
270/F	Tomographic imaging of hydrotherm. circul.	Nobes	CAN	1/87
271/E	Paleoceanogr. trans. of California current	Barron & al.	US	2/87

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JOIDES No	Title	Proponents	Country	Date
272/F	Long-term downh. measurem.in seas a. Japan	Kinoshita	J	2/87
183/B	Periplatform ooze, Maldives, Indian Ocean	Droxler & al.	US	3/87
259/E Rev.	Meiji sediment drift, NE Pacific	L.D. Keigwin	US	3/87
274/D	South China Sea	Zaoshu & al.	CHINA	3/87
275/E	Gulf of California (composite proposal)	Simoneit & al.	US	3/87
232/E Add.	Clay miner. & geoch.: Juan de Fuca Ridge	B. Blaise & al.	CAN/FR	3/87
276/A	Equat. Atlantic transform margins	J.Mascle	FR	4/87
277/E	Aseismic slip in the Cascadia margin	Brandon	US	4/87
278/E	Blanco transf. fault: Alter., layer three.	R. Hart & al	US	5/87
279/E	Anatomy of a seamount: Seamount 6 near EPR	R.Batiza	US	5/87
280/E	Cretac.Geisha Seamounts & guyots, W-Pac	P.R. Vogt et al.	US	6/87
281/D	Accret.prisms at Kuril/Japan trench&Nankai Tr.	Y. Okumura & al.	J	6/87
282/E	Tracing the Hawaiian hotspot.	N. Niitsuma & al.	J	6/87
283/E	Kuroshio current and plate motion history	R.D.Jacobi & al.	US	6/87
284/E	Escanaba Trough, S-Gorda Ridge Hydroth.	Zierenberg & al.	US	7/87
285/E	Jurassic quiet zone ,Western Pacific	Handschumacher & al.	US	7/87
286/E	Return to 504/B to core & log layer 2/3 trans.	K.Becker	US	7/87
287/E	Deep drilling in the M-Series,Western Pacific	Handschumacher & al.	US	8/87
288/B	Repositioning of EP2 to EP12,Exmouth Plateau	Mutter & al.	US	8/87
289/E	Mass budget in Japan Arc-10Be Geochemical Ref.	S. Sacks & al.	US/J	8/87
66/F Rev.	Laboratory rock studies to reveal stress	N.R. Brereton	UK	9/87
76/E Rev.	EPR: oceanic crust at the axis	R. Hekinian	FR	9/87
177/D Rev.	Zenisu Ridge: Intra-oceanic plate shortening	A. Taira & al.	J/FR	9/87
224/E Rev.	Escanaba trough (Gorda Ridge), NE Pacific	M. Lyle & al	US	9/87
242/D	Backthrusting & back arc thrust., Sunda arc	Silver & al.	US	9/87
290/E	Axial Seamount, Juan de Fuca Ridge	P.Johnson & al.	US	9/87
291/E	Drilling in the Marquesas Islands chain.	J.H. Natland & al.	US	9/87
292/D	Drilling in the SE Sulu Sea	Hinz & al.	G	9/87
293/D	Drilling in the Celebes Sea	K. Hinz & al.	G	9/87
155/F Rev/1	Downhole measurt.in the Japan Sea	T. Suyehiro & al	J	9/87
294/D	Ophiolite analogues in the Aoba Basin,Vanuatu	J.W.Shervais	US	10/87
46/D	South China Sea margin history	D.Hayes & al.	US	11/87
273/C	Southern Kerguelen Plateau	Schlich et al.	FR/AUS	11/87
295/D	Hydrogeol.& structure,Nankai accr.complex	J.M. Gieskes & al.	US	12/87
296/C	Ross Sea, Antarctica	Cooper & al.	US/NZ/G	12/87
297/C	Pacific Margin of Antartic Peninsula	P.F. Barker	UK	12/87
247/E Rev.	NE Pacific: Oceanogr.,climatic & volc.evol.	B.D. Bornhold	CAN/US	1/88
298/F	Vertical seismic prof. in Nankai Tr. ODP Sites	G.F. Moore	US	1/88
299/F	Self-bor. p-meter: study deform.in accr. sed.	M.Brandon & al.	US/CAN	2/88
300/B	Return to site 735B-SW Indian Ridge	H. Dick & al.	US/CAN	2/88
301/D	Integrated proposal: Nankai forearc	J.Gieskes & al.	US/J	3/88
302/F	Electrical conductivity structure,E-Japan Sea	Y.Hamano & al.	J	3/88
194/D Rev/2	South China Sea	K.J. Hsü & al.	CHINA	4/88
303/E	Fracturing /volcanism on Hawaiian swell	B.Keating	US	4/88
190/D Add.	New Hebrides (Vanuatu) arc-ridge collision	Fisher & al.	US/FR	5/88
163/D Rev.	Zenisu Ridge: Intraplate deformation	S. Lallemant & al	FR	6/88
221/E Suppl.	Equatorial Pacific: L.Cenozoic paleoenviron.	N. Pisias & al.	US	6/88
304/F	ODP Nankai downhole observatory	H.Kinoshita & al.	J	6/88
305/F	Artic Ocean drilling	P.J. Mudie & al.	CAN	6/88
306/E	Old Pacific History	Y.Lancelot & al.	FR/US	6/88
233/E Rev.	Oregon accr. complex: fluid proc. & struct.	L.D. Kulm & al.	US	7/88
307/E	Cross Seamount, Hawaiian swell	B. Keating	US	7/88

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A: Atlantic; B: Indian; C: Southern; D: Western Pacific; E: Central and Eastern Pacific; F: Instrumental &Miscell.

JOIDES No	Title	Proponents	Country	Date
308/E	Reactivated Seamounts,Line Island chain.	B.Keating	US	7/88
3/E Add.	Drilling in vicinity of Hawaiian Islands	R.S.Detrick & al	US	7/88
222/E Rev.	Ontong Java Pl.: origin, sedim. & tectonics.	J. Mahoney & al.	US	7/88
155/F Rev/2	Downhole measurement in the Japan Sea	T. Suyehiro & al	J	8/88
309/F	VSP Program at sites Bon-2 and Bon-1	P.Cooper	US	9/88
310/A	Geochemical sampling ,dippings ,E-Groenland	A.Morton & al.	UK	9/88
311/A	Sedim. equivalent of dippings ,Rockall	D.Masson & al.	UK	9/88
312/A	Potential of drilling on Reykjanes Ridge	J.Cann & al.	UK	9/88
313/A	Evolution of oceanog. pathway: The Equat. Atlan.	E.Jones & al.	UK	9/88
314/D	Fluid flow & mechan. response, Nankai	D.Karig & al.	US	9/88
316/E	To drill a gaz-hydrate hole (West Pacific)	R. Hesse & al.	CONSOR.	9/88
59/A Rev.	Continental margin sediment instability	P.P.E.Weaver & al	UK/NETH/CAN	9/88
3/E Rev/2	Flexural moats, Hawaiian Islands	A.B. Watts & al.	US	10/88
315/F	Network of perm. ocean floor broad band seism.	G.M. Purdy & al.	US	10/88
275/E Rev.	Drilling the Gulf of California	Simoneit (ed.) & al	US	10/88
271/E Rev.	Paleocean. transect of California current	J.A. Barron & al	US	10/88
195/E Suppl.	Paleoenviron. and paleoclim. in the Bering Sea	D.W. Scholl & al	US	10/88
199/E Suppl.	High latitude paleoceanography	D.W. Scholl & al	US	10/88
231/E Suppl.	Plate reconstr. & Hawaiian hotpsot fixity.	D.W. Scholl	US	10/88
225/E Suppl.	Plate-Reconstr.: Bering Sea	D.W. Scholl & al.	US	10/88
317/E Rev.	Northern Cascadian Subduction Zone	R.D.Hyndman & al.	CAN	12/88
318/E Rev.	Chile Margin Triple Junction	S.C.Cande & al	US	1/89
319/E Rev.	An extinct hydrotherm. syst., East Galapagos	M.R. Perfit & al	US/CAN	2/89
320/A	High Northern latitude paleoceano. & paleoclim.	E. Jansen & al	NOR/SWED.	3/89
321/E	The EPR ridge crest near 9°40' N	D.J. Fornari & al	US	3/89
322/E	Ontong Java Plateau-pipelike structures.	P.H. Nixon	UK	3/89
323/A	Gibraltar Arc	M.C. Comas & al	CONSOR	4/89
324/A	Tecton. evol. of W. & E. Mediterr. since Mesozoic	P. Casero & al.	IT/G	4/89
142/E Rev.	The Ontong Java Plateau	L. Mayer & al.	CAN/US/UK	4/89
325/E	High temp. hydrother. site N. Juan de Fuca Ridge	H.P. Johnson & al	US/CAN/UK	5/89
326/A	Continenetal margin of Northwest Morocco	K. Hinz & al	G	5/89
327/A	Argentine continental rise	K. Hinz & al	G/ARG	5/89
203/E Rev.	Cretaceous guyots in the Northwest Pacific	E. L. Winterer & al	US	5/89
328/A	Continental margin of East Greenland	K. Hinz & al	G	6/89
329/A Rev.	Paleocommunication between N & S Atlantic	J.P. Herbin & al.	FR	7/89
330/A	Mediterranean ridge, accretionary prism	M.B. Cita & al.	I/G	7/89
331/A	"Zero-age" drilling: Aegir ridge	R.B. Whitmarsh & al.	UK/G/FR	7/89
332/A	Florida escarpment drilling transect	C.K. Paull & al.	US	7/89
333/A	Tectonic and magmatic evolution: Carribean sea	Mercier de Lepinay &al.	FR/US	7/89
334/A	The Galicia margin new challenge	G. Boillot & al.	FR/SP	7/89
335/E Rev.	Drowned atolls of the Marshall Islands.	S.O. Schlanger & al.	US	7/89
336/A	Artic to north Atantic gateways	J. Thiede	G	7/89
337/D	To test the sedim. architect. Exxon sea-level curve	R.M. Carter & al.	A/NZ/US	7/89
338/D	Neogene sea-level fluctuations: NE Australia	C.J. Pigram & al.	A	8/89
339/A	Drilling transects of the Benguela current	L. Diester-Haass & al.	G/US	8/89
340/D	Evolution of foreland basins: N. Australia	M. Apthorpe & al.	A	8/89
341/A	Global climatic change-Holocene	J.P.M. Syvitski	CAN	8/89
342/A	The Barbados accretionary prism	R.C. Speed & al.	US/UK/FR	8/89
343/A	Drill in window Cret. volc. form. Caribbean	A. Mauffret & al.	FR	8/89
344/A	Western N. Atl. Jurassic magnetic quiet zone	R.E. Sheridan	US	8/89
345/A	Sea level and paleoclim. West Florida margin	J.E. Joyce & al.	US	8/89
346/A Rev.	The Equatorial Atlantic transform margin	J.Mascle & al.	FR	8/89

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A: Atlantic; B: Indian; C: Southern; D: Western Pacific; E: Central and Eastern Pacific; F: Instrumental &Miscell.

JOIDES No	Title	Proponents	Country	Date
347/A	Late Cenozoic paleocean., S.Equat.Atlantic	G. Wefer & al.	G/US	8/89
348/A	Upper Paleoc. to Neog. sequence: mid Atl. margin	K.G. Miller & al.	US	8/89
349/A	Clastic apron of Gran Canaria.	H.-U. Schmincke & al.	G/US/UK	8/89
350/E	Gorda deformation zone off N. Calif.	M. Lyle & al.	US	9/89
351/C	Bransfield Strait	D.C. Storey & al.	UK/US/G	9/89
352/E	Drilling into Layer 3, Mathemat. Ridge	D.S. Stakes & al.	US	9/89
353/C Rev.	Antarctic Peninsula, Pac. margin	P.F. Barker & al.	UK	9/89
354/A	Angola/Namibia upwelling system	G. Wefer & al.	G/US	9/89
355/E	Formation of a gaz hydrate	R. von Huene & al.	G/US	9/89
271/E Rev/2	APC coring seamounts off California.	J. Barron	US	9/89
233/E Rev/2	Oregon accretionary complex	L.D. Kulm & al.	US/G	9/89
356/A	Denmark Str.,Greenl. Scotl.&Jan Mayen ridges	P.P. Smolka & al.	G	9/89
357/E Rev.	East Pacific Rise near 12°50'	R. Hékinian & al.	FR/US	10/89
286/E Add.	Layer 2/3 transition at hole 504B	K. Becker	US	10/89
355/E Rev.	Formation of a gaz hydrate	R. von Huene & al.	G/US	10/89
221/E Add.	Eastern Equatorial Pacific Neogene	N.G. Pisias & al.	US	11/89
317/E Add.	Northern Cascadia subduction zone	R.D. Hyndman & al.	CAN	11/89
358/A	To drill a transect at the Vøring margin	O. Eldholm & al.	NOR	11/89
359/A	North Atlan. conjug. passive margin	B. Tuchloke & al.	US/CAN/FR	11/89
360/D	Valu Fa Ridge (Southern Lau Basin)	U. von Stackelberg & al	G	12/89
361/A	Active Hydrotherm. Mid-Atlantic Ridge	G. Thompson & al.	US /UK	1/90
362/E Rev.	Chile margin triple junction	S.C. Cande & al.	US/UK	1/90
363/A	Plume volcanism: Grand Banks - Iberia separation	B.E. Tucholke & al.	US/CAN	1/90
364/A	Thrust units of contin. basement: central Mediter.	R. Sartori & al.	I/FR	1/90
330/A Add.	Mediterranean ridge, accretionary prism	M. Cita & al.	I/G	1/90
365/A	Conjugate passive margin - N.Atlantic	J. Austin & al.	US/CAN/FR	1/90
366/A	Labrador - Greenland (Preliminary)	M.H. Salisbury	CAN	1/90
367/C	Cool water carbonate margin: S. Australia	N.P. James	CAN	2/90
368/E	Jurassic Pacific crust: return to 801C	R.L. Larson & al.	US/UK	2/90
369/A	A deep mantle section in the Mark area	C. Mevel & al.	FR	2/90
370/A	Magmatic proces. & natur. tracers: Oceanogr. FZ	H.J.B. Dick & al.	US/CAN	2/90
371/E	To drill the Nova-Canton Trough	K. Becker & al.	US	2/90
372/A	Water circul. & vertical chemi. gradients Cenozoic	R. Zahn	CAN	2/90
373/E	Revisiting Site 505	M.D. Zoback & al.	US	3/90
374/A	Mantle heterogeneity Oceano. Fracture Zone	H.J.B. Dick & al.	US	3/90
375/E	Deep crustal drilling: Hess Deep	H.J.B. Dick & al.	US	3/90
376/A	Layer 2/3 boundary: Vema fracture zone	J.M. Auzende & al.	FR	3/90
377/F Rev.	Global network ocean floor seismometers	G.M. Purdy & al.	US	3/90
378/A Rev.	Barbados accretionary wedge	R.C. Speed & al.	US/UK/FR	3/90
379/A	Scientific drilling Mediterranean Sea	J. Mascle	FR	3/90
380/A Rev.	Clastic apron of Gran Canaria	H.-U. Schmincke & al.	G	3/90
381/A	Continental shelf and slope of Argentina	B.T. Huber	US	3/90
382/A	Upper mantle-lower crust: Vema F.Z.	E. Bonatti	US	5/90
383/A	Aegean sea: continent-continent collision	K.A. Kastens & al.	US/ESF	5/90
317/E Add/2	Seafloor bottom simulating reflectors: N. Cascadia	R.D. Hyndman	US	6/90
265/D Add.	Western Woodlark basin	S.D. Scott & al.	CAN/AUS/PNG	6/90
384/A Rev.	Venezuela basin and Aruba Gap.	A. Mauffret & al.	FR/US	7/90
385/E	Paleomag., sedi., strati.: ODP Oahu hole	B. Keating	US	8/90
385/E Add.	Paleomagn., sedim.,stratigr.: ODP Oahu hole	C.E. Helsley	USA	8/90
386/E Rev.	California margin drilling	M. Lyle & al.	US	8/90
233/E Rev/3	Central Oregon accretionary complex	J.C. Moore & al.	US	8/90
355/E Rev/2	Formation of a gas hydrate	R. von Huene & al.	G/US	8/90

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Ref.No	Abbreviated Title	Proponents	ODP-Member Participation	Received
387-Rev	Deep drilling of fast-spread crust, Hess Deep	Gillis, K., et al.	US	09/04/90
247-Add2	Water mass conversion, glacial subarctic Pacific	Authors: Zahn et al.	CAN/US	09/17/90
286-Add2	Second addendum to "Layer 2/3 Transition, Hole 504B"	Becker, K.	US	09/21/90
388----	Neogene deep water circ. and chemistry, Ceara Rise	Curry, W.B., et al.	US/ESF(S)/UK	10/01/90
345-Add	Addenda to proposal 345----	Joyce, J.E., et al.	US	10/05/90
389----	Cretaceous traverse, Western South Atlantic	Malmgren, B.A.	ESF (S)	10/29/90
362-Rev2	Triple junction, southern Chile Trench	Cande, S.C., et al.	US/UK	11/08/90
390----	Drilling in the Shirshov ridge region	Milanovsky et al.	SU	11/12/90
S-1	Lithofacies and cyclicity, Navy Fan	Piper, D.J.W., et al.	CAN/US	11/21/90
334-Rev	S reflector and ultramafic basement, Galicia margin	Boillot, G., et al.	F/ESF(E)	12/27/90
391----	Formation of sapropels, eastern Mediterranean	Zahn, R., et al.	G/US/CAN	01/02/91
059-Add	Cont. margin sed. instability, drilling adjacent turbidites	Weaver and Kidd	UK	01/15/91
392----	Mantle plume origin, North Atlantic volcanic margins	Larsen, H.C., et al.	ESF/CAN/UK	01/29/91
393----	Continent-ocean transition, Greenland volcanic margin	Larsen, H.C., et al.	ESF(DK)/UK	01/29/91
365-Rev	Conjugate passive margins, North Atlantic	Austin, J., et al.	US/F/ESF/CAN,	02/04/91
394----	Pre/syn-volcanic extensinal basins on passive v. margins	Kiørboe, L.V., et al.	ESF(DK,IS)	02/04/91
323-Rev	Alboran basin and Atlantic-Mediterranean gateway	Comas, M.C., et al.	ESF/F/UK/G/US	02/11/91
395----	Compressional tectonics on a passive volcanic margin	Boldreel and Anderson	ESF(DK)	02/11/91
396----	Testing hot-spot model for volcanic passive margins	Andersen, M.S.	ESF(DK)	02/11/91
363-Add	Paleoceanographic record at sites NR1, NR2, and NR3	Tucholke, B.E.	US	02/18/91
397----	Mantle plume and multiple rifting, North Atlantic	Skogseid, J., et al.	ESF(N/IS)	02/20/91
NAAG	North Atlantic - Arctic gateways	NAAG-DPG		02/20/91
398----	Quat. Paleoceanography, Grand Banks, Newfoundland	Piper, D.J.W., et al.	CAN	02/22/91
361-Rev	Hydroth. system, slow-spread. ridge, MAR 26°N (TAG)	Thompson, G., et al.	US/UK/F/CAN/(	03/01/91
S-2	Downhole measurements Jurassic crust, Hole 801C	Larson, R.L., et al.	US	03/20/91
346-Add	Complementary information on data status	Mascle, J.	F	03/25/91
NARM	North Atlantic rifted margins	NARM-DPG		03/27/91

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