JOIDES PLANNING COMMITTEE ANNUAL MEETING
4 - 7 December, 1991
Thompson Conference Center
University of Texas at Austin

MINUTES

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-Sironi - 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)
R. Larson (for J. Fox) - University of Rhode Island, Graduate School of Oceanography
J. Malpas - Memorial University (Canada-Australia Consortium)
J. Mutter - Columbia University, Lamont-Doherty Geological Observatory
J. Natland - University of California, San Diego, Scripps Institution of Oceanography
A. Taira - Ocean Research Institute (Japan)
B. Taylor - University of Hawaii, School of Ocean and Earth Science and Technology
B. Tucholke - Woods Hole Oceanographic Institution
U. von Rad - Bundesanstalt für Geowissenschaften und Rohstoffe (Germany)
J. Watkins - Texas A&M University, College of Geosciences

Liaisons

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

Performance Evaluation Committee

J. Maxwell - University of Texas at Austin (one day only)

Guests and Observers

J. Baldauf - Science Operator (ODP-TAMU)
T. Crawford - University of Tasmania (Canada-Australia Consortium)
E. Davis - Pacific Geoscience Centre (Canada)
H. Dick - Woods Hole Oceanographic Institution
R. Grout - Science Operator (ODP-TAMU)
H.-C. Larsen - Geological Survey of Greenland, Copenhagen (NARM-DPG)
B. Lewis - University of Washington, College of Ocean and Fishery Sciences (PCOM Chairperson designate)
A. Maxwell - University of Texas at Austin, Institute for Geophysics (EXCOM; first day only)
A. Meyer - Science Operator (ODP-TAMU)

Panel Chairpersons

L. Garrison (for M. Ball) - College Station, Texas (PPSP)
I. Gibson - University of Waterloo (IHP)

S. Humphris - Woods Hole Oceanographic Institution (LITHP)
R. Kidd - University of Wales, Cardiff (SSP)
J. McKenzie - Eidgenössiches Technische Hochschule, Zürich (SGPP)
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)
P. Worthington - BP Research Centre, Sunbury-on-Thames (DMP)

JOIDES Office (University of Texas at Austin, Institute for Geophysics)

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

SELECTED ACRONYMS AND ABBREVIATIONS

AGU	American Geophysical Union
AMC	axial magma chamber
ARC	Australian Research Council
BGR	Bundesanstalt für Geowissenschaften und Rohstoffe
BGS	British Geological Survey
BHA	bottom-hole assembly
BHTV	borehole televiewer
BIRPS	British Institutions Reflection Profiling Syndicate
BMR	Bureau of Mineral Resources
BRGM	Bureau de Recherches Géologiques et Minières
BSR	bottom-simulating reflector
CSDP	Continental Scientific Drilling Program
CSG	Computer Services Group (ODP)
CY	calendar year
DCB	diamond core barrel
DCS	diamond coring system
DEA	Drilling Engineering Association
DFG	Deutsche Forschungsgemeinschaft
DI-BHA	drill-in bottom-hole assembly
DOE	Department of Energy
DP	dynamic positioning
DPG	Detailed Planning Group
ECOD	European (ESF) Consortium for Ocean Drilling
EEZ	Exclusive Economic Zone
EIS	environmental impact statement
ETH	Eidgenössiches Technische Hochschule, (Zürich)
FDSN	Federation of Digital Seismic Networks
FMS	formation microscanner
FY	fiscal year
GSGP	Global Sedimentary Geology Program
HRB	hard rock guide base
HRO	hard rock orientation
IDAS	isothermal decompression analysis system
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer
IGBP(/PAGES)	International Geosphere/Biosphere Program (/Past Global Changes)
ILP	International Lithosphere Program
IOC	Intergovernmental Oceanographic Commission
IPR	intellectual property rights
IRIS	Incorporated Research Institutions for Seismology
JAMSTEC	Japan Marine Science and Technology Center
JAPEX	Japan Petroleum Exploration Company
JGOFS	Joint Global Ocean Flux Studies
JOI-BOG	JOI Board of Governors
KTB	Kontinentales Tiefbohrprogramm der Bundesrepublik Deutschland
LANL	Los Alamos National Laboratory
LAST	lateral stress tool
LBL	Lawrence Berkeley Laboratory
LIPS	large igneous provinces
LRP	Long Range Plan
mbsf	meters below seafloor
MCS	multi-channel seismic
MDCB	motor-driven core barrel
MOU	memorandum of understanding
MRC	Micropaleontological Reference Center
MST	multi-sensor track
NADP	Nansen Arctic Drilling Program
NAS	National Academy of Sciences
NERC	Natural Environment Research Council
NGDC	National Geophysical Data Center
NSB	National Science Board
NSERC	National Scientific and Engineering Research Council (Canada)
OBS	ocean bottom seismometer
ODPC	ODP Council
OG	organic geochemistry
ONR	Office of Naval Research
OSN	Ocean Seismic Network
PCS	pressure core sampler
PDC	poly-crystalline diamond compact (drilling bit)
PEC	Performance Evaluation Committee
PPI	Producer Price Index
RFP	request for proposals
RFQ	request for quotes
RIDGE, InterRIDGE	Ridge Inter-Disciplinary Global Experiments (US and International)
SCM	sonic core monitor
SES	sidewall-entry sub
SNL	Sandia National Laboratory
SOE	Special Operating Expense
STA	Science and Technology Agency (of Japan)
TAMRF	Texas A&M Research Foundation
UDI	Underseas Drilling, Incorporated
USSAC	US Scientific Advisory Committee
USSSP	US Science Support Program
VPC	vibra-percussive corer
VSP	vertical seismic profile
WCRP	World Climate Research Program
WG	Working Group
WOCE	World Ocean Circulation Experiment
WSTP	water sampler, temperature, pressure (downhole tool)

JOIDES Committees and Panels:

BCOM	Budget Committee
DMP	Downhole Measurements Panel
EXCOM	Executive Committee
IHP	Information Handling Panel
LITHP	Lithosphere Panel
OHP	Ocean History Panel
OPCOM	Opportunity Committee (disbanded)
PANCHM	Panel Chairs Meeting
PCOM	Planning Committee
PPSP	Pollution Prevention and Safety Panel
SGPP	Sedimentary and Geochemical Processes Panel
SMP	Shipboard Mearurements Panel
SSP	Site Survey Panel
STRATCOM	Strategy Committee (disbanded)
TECP	Tectonics Panel
TEDCOM	Technology and Engineering Development Committee

DPGs and WGs:

A&G-DPG	Atolls and Guyots DPG (disbanded)
DH-WG	Data-Handling WG
NAAG-DPG	North Atlantic-Arctic Gateways DPG (disbanded)
NARM-DPG	North Atlantic Rifted Margins DPG (disbanded)
OD-WG	Offset Drilling WG
SL-WG	Sea-Level WG

FY93 Programs:

NAAG-I	North Atlantic Arctic Gateways, first leg (Leg 151)
NARM non-volcanic-I	North Atlantic Rifted Margins non-volcanic, first leg (Leg 149)
NARM volcanic-I	North Atlantic Rifted Margins volcanic, first leg (Leg 152)
NJ/MAT	New Jersey / Middle Atlantic Transect (Leg 150)

FY92 Programs:

A&G	Atolls and Guyots (legs 143/144)
CA	Cascadia margin (Leg 146)
CTJ	Chile Triple Junction (Leg 141)
EPR	East Pacific Rise (Leg 142)
HD	Hess Deep (Leg 147)
NPT	North Pacific Transect (Leg 145)
504B	(Deepening) Hole 504B (Leg 140)

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EXECUTIVE SUMMARY

PCOM Motions

PCOM approves the minutes of the 20-22 August, 1991 PCOM meeting. (p. 7.)

PCOM adopts the agenda for the 4-7 December, 1991 PCOM meeting. (p. 7.)

PCOM endorses SMP's recommendation to increase technical support staff on board *JOIDES Resolution* by up to 2 personnel/leg. PCOM requests that ODP-TAMU provide BCOM information by January 1992 on the continuing costs of hiring and staffing the ship with these additions, with commensurate reductions in scientific participation, to evaluate its impact on the FY93 budget. (p. 20.)

PCOM confirms the necessity of carrying out feasibility studies for deep drilling as soon as possible. PCOM asks ODP-TAMU to draft a RFP, in consultation with the PCOM chair, for the hiring of one or more consultants, to carry out such studies, using candidate sites recommended by thematic panels as a basis. The draft RFP will need to be reviewed by TEDCOM at its next meeting in April 1992. (p. 25.)

With respect to the program for drilling Atolls and Guyots II, Leg 144:
Logging at Hole 801C will remain as an alternate activity if time is available after the following conditions are met (or attempted) as part of the prospectus program (in order of precedence):
1) that MIT-1 is maintained as a basement penetration site;
2) that Seiko-1, basement site, be retained to provide required latitudinal spread in basement sites;
3) that Harrie-2 be included to provide paired sites on Limalok (Harrie) to accomplish sea level/paleoceanographic (dipstick) objectives.
4) that site Syl-4 be an alternate to Syl-2A to maintain paired pelagic cap site philosophy and to optimize recovery for those objectives. (p. 49.)

Because of its impact on Leg 145 drilling, PCOM declines the request to include OSN-2 in the FY92 program plan. PCOM continues, however, to endorse the concept of dedicated holes for ocean floor seismic observatories and looks forward to receiving from FDSN a global plan for prioritized testing and implementation. (p. 51.)

PCOM endorses the plan to dedicate no more than 1.5 days during Leg 146 to replace the sensor string in Hole 857D. PCOM requests the co-chiefs of Leg 146 to provide information on the impact of this on the scientific plan for Leg 146, for PCOM to evaluate at its April, 1992 meeting. (p. 54.)

PCOM approves the following drilling schedule for Fiscal Year 1993 (assuming 56 day legs, 5 day port calls):

147	Hess Deep	26 Nov. 1992 -	21 Jan. 1993
148	Engineering - DCS Phase IIB	26 Jan. 1993 -	23 Mar. 1993

	Back-up: Hole 504B			
149	NARM non-volcanic, Leg 1	28 Mar. 1993	-	23 May 1993
150	New Jersey / Middle Atlantic Transect	28 May 1993	-	23 July 1993
151	NAAG, Leg 1	28 July 1993	-	22 Sept.1993
152	NARM volcanic, Leg 1	27 Sept 1993	-	22 Nov.1993

(p. 74.)

PCOM moves that the NARM-DPG strategy for drilling the first non-volcanic leg be adopted. (p. 75.)

PCOM endorses all personnel actions taken at the 1991 Annual Meeting. (p. 82.)

PCOM authorizes the formation of a steering group for *in-situ* fluid sampling, to be constituted as a subset of DMP effective at its January, 1992, meeting. PCOM approves the mandate and membership of the group as described in DMP recommendation 91/17, and urges that it meet in conjunction with normally-scheduled DMP meetings. (p. 85.)

PCOM Consensuses

In view of her imminent departure from ODP/TAMU, PCOM, on behalf of the international scientific ocean drilling community, expresses thanks to Audrey Meyer, Manager of Science Operations ODP, as she leaves this position after 5 years of service to ODP. In particular, PCOM recognizes the unique manner in which Dr. Meyer has handled the process of scientific shipboard staffing, involving considerable insight into the nature of the program, and the complexities that thereby arise. PCOM offer her best wishes for the future. (p. 13.)

PCOM thanks the Panel Chairs and endorses PANCHM's recommendations. (p. 31.)

PCOM supports TEDCOM's recommendation that coring time with DCS IIB be paramount during Leg 142. (p. 44.)

PCOM thanks Nick Shackleton, who is leaving the chairmanship of the prestigious Ocean History thematic panel of ODP, for his long-lasting, inspiring, perseverant leadership. (p. 78.)

PCOM thanks the North Atlantic Rifted Margins Detailed Planning Group (NARM-DPG) for its expeditious and informative report. PCOM considers NARM-DPG to have fulfilled its charge and accordingly disbands NARM-DPG. (p. 82.)

Data-Handling Working Group Mandate

PCOM endorses a 1.5-day Data-Handling Working Group to meet in eastern North America in early March, 1992, and advise PCOM on:
1) a new database structure for ODP to cope with the rapidly-expanding needs of the project, and particularly to facilitate core/log data integration;
2) an appropriate hardware/software environment for ODP in the 1990's, compatible with 1).
A written report will be prepared and ready for PCOM review at its April, 1992, meeting. (p. 86.)

Annual Meeting JOIDES PCOM
Wednesday, December 4 1991

922. Welcome and Introduction

Austin called the 1991 Annual Meeting of the JOIDES PCOM with Panel Chairpersons to order at 8:55 AM. He introduced A. Maxwell, Director of the University of Texas at Austin, Institute for Geophysics (UTIG) and EXCOM chairperson. Maxwell welcomed the attendees. He stated that UTIG was pleased to be the current host of the JOIDES Office and praised the work of the JOIDES Office staff. Though he had been associated with ocean drilling for 30 years as co-chief, panel, PCOM and EXCOM member, Maxwell felt that ODP was now in its most critical period. Long-term renewal is under consideration and good leadership is essential. Funding for science is limited and ODP must compete with other initiatives. However, PCOM has done an excellent job so far.

Austin went on to explain meeting logistics, including plans for a dinner cruise on Lake Travis that evening, hosted by UTIG. He provided coffee mugs commemorating the 20th anniversary of UTIG and also its hosting of the JOIDES Office for PCOM members, liaisons and guests. Austin explained that the PCOM member and other representatives from the USSR had been unable to attend this meeting. He then called for introductions around the table.

923. Approval of Minutes of 20 - 22 August, 1991 PCOM Meeting

Austin called for comments, corrections and approval of the minutes of the 20-22 August, 1991 PCOM Meeting held at BGR, Hannover, Germany. The minutes included modifications received through November 15, 1991.There were no further corrections.

PCOM Motion

PCOM approves the minutes of the 20-22 August, 1991 PCOM meeting.
Motion Tucholke, second Duncan Vote: for 16; against 0; abstain 0; absent 1

924. Approval of Agenda

Austin stated that the main purposes of the Annual Meeting were to exchange information between PCOM and the JOIDES panels and to prepare the one-year drilling plan for FY93. Other important, but subordinate purposes were to hear recent scientific results from legs 139 and 140, to consider modifications to the near-term (FY92) program related to possible scheduling of supplemental science and testing of GEOPROPS, decide matters related to various reports and conduct routine business (Agenda Book, blue pages 7-9). Austin asked that Panel Chairs remain, if possible, until the end of deliberations on the FY93 schedule (Friday, December 6), to be available as possible sources of information. He called for any additions to the agenda. In the absence of additions, Austin called for adoption of the agenda.

PCOM Motion

PCOM adopts the agenda for the 4-7 December, 1991 PCOM meeting.
Motion Taylor, second Natland Vote: for 16; against 0; abstain 0; absent 1

925. ODP Reports by Liaisons to PCOM

EXCOM

Austin reported that EXCOM had last met on 9-11 July, 1991, in La Jolla, California. At that meeting, EXCOM endorsed the FY92 program plan. EXCOM's motion (Agenda Book, blue pages 9-10) specified that "if Leg 140 is Hole 504B, Leg 147 will be Hess Deep". Austin reminded PCOM that they would need to nominate co-chiefs for Leg 147 at this meeting.

EXCOM also dealt with issues of renewal, which are still evolving. The UK has committed to a 5-year renewal, with a review in 1998 and a commitment in principle beyond that date. EXCOM has commissioned a subcommittee to examine additional platforms. In addition, H. Zaremba, an independent consultant based in Durango, Colorado, had been asked to prepare a proposal for a study of such platforms. The proposal should be available before the end of December, 1991, and the study should begin in January, 1992, supported by OPCOM money. EXCOM has moved quickly to analyze the effects of additional platforms, examples of which have been proposed by the USSR, Japan and France.

Discussion

Lancelot noted that he had recently visited the USSR drilling vessel and added that what Austin had characterized as a French platform was, in reality, a European platform. Von Rad explained that he had discussed the issue of additional platforms with German officials, who felt that such platforms would be difficult to incorporate into the MOUs, since they would inevitably involve increased costs. Maxwell stated that this would be a major topic at the upcoming EXCOM meeting in Bonn (14-16 January, 1992). The report of the EXCOM subcommittee (comprising only J. Briden) had been completed and was very comprehensive, incorporating the issue of involving international partners more intimately in ODP. The January EXCOM meeting would also include presentations on various national platforms.

Lancelot noted the absence of the USSR PCOM member, adding that N. Bogdanov (USSR, EXCOM) had encouraged him to report on the USSR drilling vessel. Austin responded that the status of the USSR drilling vessel was uncertain, because of current events in that country.

Malpas asked whether there would be further discussion of options for Leg 147 after the report on Leg 140. Austin replied that, following the success of Leg 140 ar Hole 504B, there was some interest in a return to Hole 504B and a proposal to do so had been submitted. PCOM might discuss the issue further if there was time.

NSF

Malfait reported that the NSF budget had been passed by Congress and signed by the US President. The total NSF budget for FY92 increased by 11.2%. (NSF had requested an increase of 17.5%.) Detailed budget information was listed in a handout distributed at the meeting. An increase of 4% has been requested for ODP, but it was not yet clear whether this would be achieved.

NSF had tried to transfer support of Antarctic logistics to the Department of Defense (DOD), but NSF funds are still being used for this purpose. Consequently, field activities in Antarctica are uncertain and personnel may have to be withdrawn.

Field programs for 1991 and 1992 are listed in the handout. For FY93, 6 programs are under review and there will be an additional round of reviews in May.

Malfait went on to discuss renewal activities (see handout for timetable). Letters to international partners on continued participation are in the mail. The letters identify *JOIDES Resolution* as the primary platform until 1998, with a review in the 1994-1996 period. NAS has begun its review of the LRP. The first meeting was on November 21 and the second was to be at AGU on December 8. The final report is due in mid-January and, together with the new (FY93-96) 4-year program plan, will be reviewed by an NSF review panel in April before being forwarded to the NSB. The FY92 program plan has been approved at $41.4M and includes an increase of $167,000 to cover some unexpected costs and overruns.

Additional funds have been provided for GEPROPS. GEOPROPS had received strong support from PCOM and DMP. ODP-TAMU presented a plan for its development and B. Carson has made a significant contribution. Malfait felt that GEOPROPS development had not turned out well and had implications for development of third-party tools. On being asked to amplify on this last point by Austin, Malfait said that people involved in development of GEOPROPS had done a great deal of work and were unhappy with the pace of development and testing. Austin said that GEOPROPS would be an agenda item for later discussion.

Malfait continued his report, noting that E. Ambos (California State University, Long Beach) would be joining NSF's ODP staff as a rotator. A proposal to build a seismometer for the OSN-1 hole was under review by NSF's ODP and Earth Sciences programs. Proposals for a full pilot experiment at OSN-1 would be submitted later. NSF's ODP and Earth Sciences programs would also jointly consider a proposal for land-based drilling as part of the proposed NJ/MAT ODP drilling program. The target figure for USSAC Calendar Year 8 (CY8) activities has been provided to JOI, Inc. Increases in travel costs were a cause for concern and would be examined by USSAC and JOI, Inc. over the next year.

Discussion

Mutter asked about the scope of the NAS review. Malfait replied that it was restricted to the LRP. In response to a question from Natland, Malfait said that he did not have detailed information on the growth in travel costs. Austin commented that there was a $70,000 deficit in travel by US personnel alone for FY91. Von Rad stated that Germany is reluctant to sign the MOU with the attachment on intellectual property rights. He felt that other international partners would have the same problem and recommended that this issue be examined by specialists.

JOI, INC

Pyle began his report with a wrap-up of of FY91 (Appendix 1). NSF has provided an additional $167,000, with the result that cost overruns will have no impact on operations. Of the additional funds provided to overcome last year's fuel cost problem, $1.17M remains. This will be applied to cover future unexpected developments and is not a bonus. Pyle foresaw no special problems for FY92. BCOM has approved OPCOM's recommendations.

Austin asked when OPCOM funds would become available. Malfait explained that NSF had originally stated its willingness to consider a $2.1M increase to further the achievement of LRP objectives. This was based on there being 7 international partners. Malfait said that he could add nothing further and that he could not say when the recommendations would be acted upon. Pyle stated that JOI, Inc. was ready to submit the proposal on the OPCOM recommendations to NSF.

Pyle went on to discuss high-temperature tools. JOI, Inc. has proposed that the US Department of Energy (DOE) fund a slimline, high-temperature, downhole water sampler, while ODP advises on construction and develops the "uphole" deck and laboratory equipment. However, it was proving difficult to get joint work with DOE started. J. Edmond (MIT) has been asked to chair an *ad hoc* geochemical advisory group to meet on December 9, 1991, at AGU. Pyle asked for suggestions for additional members from international partners.

A DCS review meeting took place at ODP-TAMU about 1 month before the PCOM meeting. It was concluded that more experience is required in coring with DCS IIB, requiring at least one more leg in addition to Leg 142. DCS III was felt to be a vital step both for safety and coring efficiency. The meeting recommended continuing with DCS III design, but deferring construction until more experience has been gained with DCS IIB.

Pyle showed a calendar for development of the FY93-96 4-year program plan (Appendix 1). The program plan must be complete by mid-March, 1992. BCOM will meet earlier than usual (in Bonn, January 16-17, 1992, following EXCOM) in order to meet this deadline.

The study of additional platforms by consultant H. Zaremba has been approved and JOI, Inc. was awaiting his proposal. JOI, Inc. wanted PCOM to coordinate and prioritize panel recommendations regarding equipment purchases, to assist with decision-making in case of conflicts and limited funds. Other matters considered by JOI, Inc. included a review of the submission of panel minutes (Appendix 1), renewal issues, and a review of international purchases and personnel.

Discussion

Austin reported that PANCHM discussed changes to the schedule of meetings which might remedy late submission of panel minutes. Lancelot emphasized the importance of prioritizing tool requirements. Austin responded that PCOM has prioritized engineering developments, but not non-engineering tasks. He added that he would propose that PCOM annually (at its April meeting) review a short list of measurement requirements. Prior to that meeting, the panels will provide a condensed list of equipment they would like to see purchased.

Taylor asked whether subcontractors' proposals for post-1993 ODP will also be available by the March deadline. Pyle replied that subcontractors will provide budgets that must be within estimates in the LRP. Austin said that he would schedule time later in the meeting for discussion of PCOM input to the 4-year program plan. He suggested that it might be important for some panel members to attend the *ad hoc* geochemical advisory group meeting at AGU and asked Pyle to provide details of time (December 9, 1991) and venue.

SCIENCE OPERATOR / ODP-TAMU

Francis commented that a large contingent from ODP-TAMU, comprising J. Baldauf, R. Grout, A. Meyer and M. Storms, was attending this PCOM meeting because of its proximity to College Station.

Francis reported that Leg 139 (Sedimented Ridges I) had shown, at the first attempt, that ODP can successfully operate in hydrothermal environments in water depths >2000 m (Appendix 2). Maintaining circulation had been successful in cooling holes. Butyrate liners were used most of the time and conventional seals proved adequate. High-temperature drill bits were not required. There had been no serious safety problems and H_2S precautions had been more than adequate. It was felt that high pH of pore fluids had inhibited degassing. Core recovery of indurated material had been low, perhaps owing to effects of thermal shock. A total of 160 m of massive sulfides had been drilled with good recovery, though hole cleaning had been difficult because of high density of cuttings. Mud circulation might be required for future attempts to drill massive sulfides. Leg 139 ended in Victoria, BC, on September 11, 1991.

Leg 140 operations at Hole 504B began on October 1, 1991, after a 15.5-day transit. The first day was spent logging and part of the FMS was lost. Five unsuccessful fishing runs were then made with different tools in attempts to recover junk left in the hole following Leg 137. A move to HD appeared probable. Finally, a double-dog fishing tool, manufactured on board, successfully retrieved the junk. Coring began on October 12 and 10 bit runs were made (Appendix 2). The record for deepest penetration, set on Leg 47, was broken on October 20. Drilling was terminated on November 6, having reached 2000.4 mbsf. Leg 140 concluded with 3 days of logging. Hole 504B was left clean and Leg 140 ended in Panama on November 12.

Coring on Leg 140 was more successful than on previous legs because of: 1) the conservative approach adopted (more mud was used and every time a core was cut, the new bit was reamed in), 2) subtle changes in bit design that led to longer rotating life, and 3) decisions made by Drilling Superintendent E. Pollard, who did an excellent job. The average rate of penetration, including pipe trips, was 15 m/day. Total time spent at Hole 504B by both DSDP and ODP has been ~180 days (~6 months) at a cost of ~$20M. Total time spent fishing or cleaning has been 37.5 days, or 20% of the total. This should be borne in mind for future operations.

Austin asked how rate-of-penetration compared to that on Leg 111. Becker replied that there was no indication that rate was decreasing. Francis noted that a great deal of the total time at Hole 504B had been spent on downhole measurements. Becker added that if that time was removed, penetration rate had been steady at ~2 m/hr.

Francis went on to report on Leg 141 (CTJ), in progress. Leg 141 sailed from Panama on November 15, 1991, for a transit to Valparaiso, where there was an exchange of personnel. The scientific party had been given the option of joining at Panama or Valparaiso. The transit provided a useful opportunity for cross-training of engineers, upgrading the geochemistry laboratory, installing the second Rock-Eval, upgrading the computer system and beginning modifications to the main core laboratory. The transit ended on November 25. Among the group boarding in Valparaiso were 4 Chilean participants, all sailing as scientists. On November 28, beacons were dropped at sites SC-3, SC-1 and SC-2. Drilling began at Hole 859A (SC-3) on November 29. Sediment was predominantly stiff clay; an early switch was made from APC to XCB coring. A number of WSTP and PCS runs had been made. The WSTP had worked well, but the PCS had not yet been run successfully after 4 attempts. No hydrates had been encountered. XCB recovery was so low that a switch to RCB coring was

made at ~146 mbsf. The latest information available was that a penetration of 280 mbsf had been reached. The level of the BSR had been penetrated at ~80 m with no apparent difference in the amount of gas in cores. A temperature inversion had been encountered, with a maximum temperature of 21.5°C at 136 mbsf, falling to 10.5°C at 260 mbsf. There may, therefore, be a double zone of hydrate stability. Heavy hydrocarbons were being encountered, probably a consequence of fluid migration, which might also have caused the temperature inversion.

Francis explained that M. Storms would discuss Leg 142 (Engineering/EPR) on the following day. Legs 143/144 (A&G) had their safety review by PPSP in late October, 1991; no safety problems were expected. At the pre-cruise meeting, the A&G co-chiefs realized that there was insufficient time available to achieve the objectives set by A&G-DPG. Austin commented that drilling times had been underestimated by a total of >20 days. Francis pointed out that one source of the discrepancy was that 3 HRBs are needed, whereas only 1 had been expected. This would add 2.5 days to each site. Furthermore, *JOIDES Resolution* could only carry 2 HRBs, so that one would have to be recovered and moved. The test of the shallow-water drilling capability of *JOIDES Resolution* would be carried out at the end of Leg 143 in Enewetak lagoon; it would take a total of 60 hrs, including extra transit time. The prospectus for Leg 144 was on hold until PCOM decided whether to schedule logging of Hole 801C during the leg. A charter flight had been arranged to Majuro (port call between legs 143 and 144) for ODP personnel, since hotel accommodation is very limited.

Kidd noted that SSP was concerned about basement picks on seismic data crossing A&G sites. The best seismic data were from Enewetak; these suggested that basement at other A&G sites was likely to be deeper than originally thought. SSP had suggested that ODP-TAMU reconsider basement picks. Kidd asked whether this had been taken into account in making new estimates of drilling time. Meyer replied that it had not, and that the main reason for increased drilling times was that estimates of limestone velocities had been increased (from 2.0 km/s to 2.5 km/s). Larson commented that one additional HRB was suggested by the co-chiefs and was not in the A&G-DPG report. Austin remarked that, though some had felt that 2 legs of A&G drilling was too much, it was now clear that there was not a lot of time available.

Francis continued his report with Leg 145 (NPT), which included 4 main drilling locations, each comprising several sites. Detroit Seamount had 5 sites, up to 75 miles apart. Detroit Seamount was close to USSR waters, which would have to be entered during pre-site surveys. ODP-TAMU was, therefore, exploring the need for clearance. Requirements for drilling the OSN-2 hole had been clarified at 5.7 days, including 22 hrs contingency time (one round pipe trip). Duration of Leg 145 would be 59 days, including 18 days transit.

Leg 146 (CA) was previewed by PPSP in October, 1991; it would have its full safety review in March, 1992. Some anxiety over hydrocarbons had been expressed. Francis concluded his discussion of upcoming legs by noting that, since DCS III will not be ready in time, Leg 147 must be HD.

Regarding other matters, the Leg 138 scientific party had decided not to take all samples on board and held a 5-day "sampling party" in conjunction with the post-cruise meeting in College Station (Appendix 2). Total attendance had been 21, of whom 15 were "serious samplers". A total of 36,312 samples were taken, including 21,227 during Leg 138 and 15,085 at the post-cruise meeting. The record was still held by Leg 133, for which over 40,000 samples were taken. However, the Leg 138 scientific party were able to take fewer samples than would have been taken had all sampling been carried out aboard ship because, by the time of the post-cruise meeting, they had a carefully developed sampling strategy. The total cost of the sampling party

was ~$40,000. This practice can only be followed at ODP-TAMU, and not at the LDGO core repository, because of space requirements.

Increasing use of the MST and general congestion had necessitated modifications to the core laboratory. The reconfiguration was begun on the transit to Valparaiso and should be concluded on Leg 142. There was now room for >1 MST (Appendix 2).

Status of equipment recommendations is shown in Appendix 2, as is the publications schedule. Initial Reports up to Leg 133 and Scientific Results up to Leg 119 (plus Leg 124) had been published and distributed. Leg 121 Scientific Results volume was in the process of being distributed. IHP recommended revision of the indexing system. The Leg 121 Scientific Results volume had a transitional index and the Leg 122 Scientific Results volume, to be distributed in February, 1992, would be the first with the new index.

ODP-TAMU had offered to supply an ODP poster to the institution of each PCOM member. The poster (a prototype of which was on display at the meeting) contained information on the leg in progress together with the 2 preceding and 2 upcoming legs. The poster would be updated every other leg. Those interested in obtaining the poster should contact A. Meyer at ODP-TAMU.

Additional shipboard computer systems managers would be hired to enable 2 to be sailed on each leg, as per IHP and SMP recommendations.

Francis concluded his part of the report by informing PCOM that A. Meyer, ODP's Manager of Science Operations since September, 1986, would be leaving ODP in January, 1992. J. Baldauf would be acting Manager of Science Operations until her replacement was selected.

Meyer reported on shipboard staffing. Up to and including Leg 142, there would have been just over 1000 participants, 50.3% US (see pie diagram in Appendix 2). Meyer would be staffing legs to Leg 145. A specialist in Cretaceous large, shallow-water forams was needed for Leg 143 and a physical properties specialist for Leg 145. From Leg 146 onward, J. Baldauf would staff legs. He had started on Leg 146 and would start on Leg 147 when co-chiefs had been nominated.

PCOM expressed the following consensus.

PCOM Consensus

In view of her imminent departure from ODP/TAMU, PCOM, on behalf of the international scientific ocean drilling community, expresses thanks to Audrey Meyer, Manager of Science Operations ODP, as she leaves this position after 5 years of service to ODP. In particular, PCOM recognizes the unique manner in which Dr. Meyer has handled the process of scientific shipboard staffing, involving considerable insight into the nature of the program, and the complexities that thereby arise. PCOM offer her best wishes for the future.

WIRELINE LOGGING / ODP-LDGO

Lyle reported that the number of logging strings run during 1991 would be ~70 (see Appendix 3 for comparisons with previous years) and that ~75% of holes drilled were now logged. Staffing was now adequate for handling the information flow at this level of logging (including the FMS).

Leg 139 (Sedimented Ridges I) involved a significant downhole measurements program (Appendix 3), which had been very successful, though a strain on the system. The first geochemical logs in massive sulfides were run. Large Uranium spikes were probably associated with barite. Core recovery in basement was low and logs, therefore, assumed increased importance. Intervals of low resistivity and low SP were associated with fluid inflow in Hole 857D (Appendix 3). Lyle stressed that logging in hydrothermal systems was always an experiment, because temperature conditions change.

Leg 140 logging involved some successes and some failures (Appendix 3). The FMS lost some arms in Hole 504B, but it was hoped that this problem had been corrected. Tools with nuclear sources were avoided for fear of junking Hole 504B with them. Temperature logs showed that flow characteristics of Hole 504B appeared to change from leg to leg.

Leg 142 would involve a test of logging in conjunction with DCS drilling. An outstanding question was whether logging tools could be pushed out through the end of the DCS drill pipe. The Japanese magnetometer would be tested on legs 143 and 144. It was originally intended to be attached to the base of the Schlumberger string, but was not sufficiently robust. In addition, it was no longer a high-temperature tool, as originally planned. The French (LETI) low-resolution (1.5m) magnetic susceptibility tool would be tested on Leg 145. Leg 146 would include a major downhole program involving fluid sampling and permeability measurements.

Downhole measurement technology requirements of potential FY93 programs are listed in Appendix 3. Most potential FY93 legs were not difficult from a downhole measurements perspective. An exception was TAG hydrothermal, where high temperatures were expected and the DCS might be required.

Lyle concluded his report with a note on staffing. R. Jarrard left ODP-LDGO in August and a replacement was being sought. A new assistant systems manager was being hired. The number of processing staff had now stabilized, but additions to technical operations and science staff were being sought.

Lancelot informed PCOM that a prototype high-resolution (1 cm) susceptibility tool was being tested in France. The goal for its readiness was FY93. Austin identified GEOPROPS and additional Leg 147 planning as action items for consideration by PCOM later in the meeting.

926. Annual Reports by Service Panel Chairs

DMP

Worthington stated that DMP had stabilized at 3 meetings/yr (1991 and planned 1992 meetings are listed in Appendix 4). The June, 1992, meeting would include 1 day jointly with KTB.

There had been 4 recent membership changes (Appendix 4). In addition, a replacement would be needed for R. Wilkens, preferably from a JOI institution.

Worthington listed 1991 highlights for DMP (Appendix 4). Shipboard, computer-based integration of core and log data was fundamental to the future of ODP and would place ODP ahead of any other scientific or industrial organization in the world. DMP had worked with SMP on this issue. A paper on core-log integration, presented in Australia, generated a great deal of oil industry interest. A high-temperature resistivity tool was under development in the UK. An ongoing issue was the increased failure rate of tools at high temperatures, which required redundancy. Links with SGPP included consideration of logging of gas hydrates.

The working group on *in-situ* pore fluid sampling met in Houston on August 23, 1991, convened by Worthington and D. Huey of ODP-TAMU. DMP recommended reinforcing the group's recommendations with a steering committee (Appendix 4).

Worthington went on to discuss directions for 1992 (Appendix 4). 1) Options for pore fluid sampling must be a priority. 2) Further progress must be made on integration of core and log data. 3) A public information brochure on downhole measurements was felt necessary by DMP to increase awareness. 4) Guidelines for the monitoring of third-party tools were published in the February, 1991 *JOIDES Journal*. DMP was happy with the guidelines, but their implementation was a cause for concern. Worthington proposed that DMP examine enforcement, which he stressed must be strict. 5) The new MAXIS system was the main component of future plans for log data acquisition, processing and distribution. The goal was to get log data to scientists in real time. 6) Development of COSOD II technologies should continue. Worthington highlighted measurement while drilling and borehole gravimetry; a key question was whether ODP should proceed with developments or wait. 7) DMP would pursue the topic of lithosphere characterization and address questions of how homogeneous the lithosphere is and how representative boreholes are.

DMP's causes for concern (Appendix 4) were: 1) reluctance to log because it impacts on core acquisition (Worthington characterized this as a return to a "pre-1987 mentality" with reference to the role of logs in ocean science); and 2) inadequate general awareness of the scientific legacy of ODP holes in terms of integrated databases, resulting from an over-focused mentality and antiquated views. The remedies to these causes for concern were education, information and showing results.

Discussion

In response to a question from Duncan, Worthington said that DMP members could submit a proposal to study lithosphere characterization. However, DMP received a message that this might be 2-3 yrs premature because tomography questions had not yet been resolved. Cross-hole resistivity is simpler.

Natland asked whether DMP was satisfied with the way PCOM plans logging programs. Worthington replied that DMP was happy overall with the way ODP works. However, one problem was that DMP had to provide logging suggestions for proposals when they were at an early stage, while their future evolution and likelihood of being drilled were uncertain. On the other hand, it was good to get DMP's views into the system early. He added that logging data must be core-calibrated. This became very important when recovery was low.

Von Rad informed PCOM that a 3-axis magnetometer rated to 300°C was being built by BGR and should be ready in September, 1992.

Taylor raised the issue of DMP's recommendations on logging in accretionary complexes. Worthington responded that one question was the extent to which swelling of clays is affected by drilling or by tectonics, adding that tectonics cannot be changed. Answers to all questions concerning logging in accretionary complexes cannot yet be provided. Taylor asked whether logging will be successful on Leg 146 (CA). Worthington replied that, though Nankai logging did not go well, he had been informed that CA was unlikely to give the same problems. He added that logging productivity had improved, due to use of the SES and mud treatment (though the latter was expensive). Lyle agreed that experience was being gained, but Storms added the qualifier that risk of loss of the BHA increased with use of the SES, since it encouraged perseverance in difficult conditions.

Austin asked whether the requested steering committee on *in situ* fluid sampling (Appendix 4) would have to meet separately from DMP meetings. Worthington answered that it would depend on timing of developments in fluid sampling. He felt that a balance could be achieved.

Kidd commented that he had heard a rumor of a program to log ODP holes equipped with re-entry cones. Worthington stated that there were opportunities that had not been fully utilized and that some holes were deteriorating and opportunities would be lost.

IHP

Gibson began by noting that IHP had been inherited from DSDP. Its mandate, which originally concerned publications, had been widened to include computing and data handling on *JOIDES Resolution* and also curation. Publications were under control for the most part, though some concerns remained. However, there were serious concerns about the other areas.

IHP recommendations to PCOM were summarized on Agenda Book, white pages 186-187. They were: 1) that a cumulative index for the first 25 legs be prepared; 2) that additional staff be provided at the East Coast Repository; 3) that a second shift of shipboard systems operators be authorized to allow 24-hour coverage (PCOM had already acted on this recommendation); and 4) that a working group be established to review all computer hardware and software systems (ship- and land-based).

Expanding on the working group recommendation (4, above), Gibson said that the Leg 138 scientific party had great difficulty integrating large volumes of core and log data collected because of the way data were handled on board *JOIDES Resolution* and the shipboard computer operating system, now 7 yrs old and out of date. Productivity of shipboard scientists was being affected and the system should be changed. IHP recommended some sort of review of shipboard and ODP-TAMU systems, but Gibson now feared that this might take too long.

Discussion

Pyle said that JOI, Inc. had asked ODP-TAMU to review computer systems. He felt that action should not be too precipitous since this might lead to purchase of the wrong equipment. Austin noted that the ODP-TAMU review meeting was scheduled for late January, 1992. Taylor said that any reviews should include logging data and the MAXIS system. Lyle stated that the

problem was that MST files were sent to the Vax and the time delay was such that it might be too late to change the coring offset to ensure full recovery. Shackleton commented that core-log integration must be done in real-time. Speed was the key.

Natland asked what would be required. Gibson replied that a new data base structure was necessary and probably new hardware. This would impact many shipboard activities. Lancelot felt that careful planning would be required and that it might be preferable to patch up the computer system to retain flexibility in the face of rapid technological developments. Gibson agreed that flexibility was necessary, adding that there is none at present. Taylor believed that a Unix operating system was essential and that, therefore, a major hardware change would be needed. This would have to be included in the budget. Austin asked when the ship was next scheduled for yard maintenance. Francis replied that it would take place during the period beginning in November, 1993, to early 1994. He agreed that a major computer system change would take some time and could not be done during a normal port call. It might perhaps be accomplished during an engineering leg or a long port call. Storms pointed out that other systems would be introduced over the next few years, including hard-rock core orientation, SCM, drilling statistics (mud use, etc.). These would impose additional data handling requirements. Mutter suggested that leasing computers might be preferable to purchasing.

Austin said that formation of a computer working group would be deferred to later in the meeting. He commented that such a group must not work in opposition to the January ODP-TAMU internal meeting. Austin added that attendance at the ODP-TAMU meeting is open and urged that an ODP-LDGO representative attend. Francis thought that many people would attend both the ODP-TAMU meeting and that requested by IHP. Gibson suggested that PCOM might wish to mandate a consultant to study the problem instead of setting up a meeting. Austin responded that, in that case, IHP should nominate an individual. He felt that someone like W. Meyer (former ODP-TAMU systems manager) would be ideal; the individual would need to know something about ODP in addition to computing. Lancelot added that the shipboard computing system has special characteristics and the person must be familiar with shipboard systems. Austin noted that the choice should not be restricted to US consultants. Taylor asked whether PCOM should tell ODP-TAMU to replace the shipboard Vax, but Austin deferred further discussion to *Other Business*.

PPSP

Garrison reported that PPSP had met twice in 1991 and that it had been a good year for safety. PPSP reviewed Sedimented Ridges, HD, 504B, CTJ, EPR, A&G and pre-reviewed CA. PPSP approved 39 sites and was pleased with the H_2S precautions taken on Leg 139. The planned penetration of BSRs on Leg 141 (CTJ) was of great interest to PPSP. Though formerly opposed, PPSP now favored such a test. The next PPSP meeting was scheduled for mid-March, when NPT and CA would be reviewed.

SMP

The SMP annual report is summarized in Appendix 5. Moran began with a discussion of SMP's shipboard laboratory reviews. Paleomagnetics: measurements were generally good, though there were some problems with core contamination. Micropaleontology: a micropaleontological reference slide collection should be on board *JOIDES Resolution*. Physical properties: improvements related to core/log integration were needed (natural gamma and resistivity measurements were required), and the laboratory must be optimized to reduce the workload on physical properties specialists. Sedimentology: core reflectance measurements

should be routinely made on sediments. Petrology: procedures were required for use of the XRF for sediment analyses. Geochemistry: a survey of geochemistry laboratory requirements had been carried out; equipment upgrades in the geochemistry laboratory were required. Underway geophysics: new navigational equipment had yet to be purchased (Meyer stated that an RFP should be released in January, 1992).

SMP felt that procedures for discrete measurement of index properties should be better defined. Too many different methods were in use. Density measurement was a particular problem. A single method would be specified to promote consistency. CATSCAN technology may enable the number of discrete density measurements to be reduced in future.

Core/log integration was discussed by SMP and DMP at a joint meeting in October, 1991. The key requirement of core/log integration was to provide the same depth scale on cores and logs. Requirements for equipment, data handling and personnel are listed in Appendix 5. Data handling requirements would require reorganization of onboard computing.

SMP recognized 3 types of core disturbance: physical disturbance by coring (downhole), contamination and pressure relief. SMP's recommendations on core disturbance are listed in Appendix 5. (Copies of SMP's report on core disturbance, arising from its October, 1991, meeting, were available at the meeting.)

SMP's 1990 recommendation that the number of ODP-TAMU technical staff be increased was reiterated. In addition, SMP felt that specific training for micropaleontological sample processing was needed. Finally, SMP discouraged cycling of technical staff among shipboard laboratories.

SMP's list of equipment needs, recommendations for upcoming legs 143/144 (A&G) and 146 (CA), and results of the geochemistry survey are presented in Appendix 5. Respondents to the geochemical survey agreed with PCOM's policy to terminate routine OG sampling, but felt that frozen samples should be retained pending results of advertising their existence.

Discussion

Lancelot asked whether hard-rock core orientation was working. Storms responded that the system would be tested on Leg 141 and comprised 3 components: scribers, SCM and electronic multishot.

Shackleton asked whether SMP had looked into APC core-stretching. Moran replied that the 10% stretching was believed to be due to the elastic response of the cores to pressure relief. Stretching may vary between 4% and 15%, depending on rheology. Measurements should be made on different materials so that the effect can be compensated for. Shackleton felt that it might be preferable to spend available funds on improving the ability to pull out the APC rather than on the breakaway piston head (one of SMP's recommendations on core disturbance; Appendix 5). Moran said that it was felt that APC pull-out had now been optimized. Storms added that APC pull-out capability had been improved recently, though there were other improvements that could be investigated. Francis pointed out that there were staffing implications of SMP's recommendations, including core disturbance studies. PCOM would have to make core disturbance an important engineering priority before ODP-TAMU could work on it. In addition, space available aboard *JOIDES Resolution* for extra equipment was

limited and overloading of staff and scientists was a potential problem. Austin noted that related issues were raised by PANCHM and would be discussed later.

Natland felt that SMP was sediment-oriented. He asked whether the systematic description of igneous and hydrothermal deposits, for application to core/log integration, had been considered. Moran responded that physical properties and, e.g., XRF, were the main core/log integration tools, not visual description. Moores asked if any systematic shipboard search for structural features was carried out. Moran replied that it depended on the personnel involved and was not routine. Meyer added that ODP-TAMU was sailing structural geologists more commonly.

Taylor asked how lists of panel recommendations would be provided that were suitable for PCOM prioritization. Austin responded that a short list of non-engineering recommendations was required; PANCHM had considered this. Such a list should be available for PCOM at its April, 1991, meeting. Francis pointed out that ODP-TAMU could implement some panel recommendations without going through PCOM (e.g., the new indexing system), but that others would need PCOM prioritization.

Austin noted that PCOM considered limiting the size of scientific parties at its April, 1991, meeting. If the scientific party must remain at 28 or 29, some must be technicians. PCOM could make a stronger recommendation to this effect. Taylor felt that this approach would not work with complex instruments, e.g., XRF, where continuity was preferable. Meyer emphasized that more technicians means fewer scientists. Austin said that the MOUs were specific and that co-chief balance was less important to the international partners than their level of scientific participation. Some international partners have said that they wished to sail only scientists, not technicians. Lancelot stated that, as a representative of an international partner, he would be prepared to reduce scientific participation from an average of 2 to 1.5 scientists per leg if it would increase efficiency. Austin reminded PCOM that the idea had been to provide 2 extra technicians per leg. Cita-Sironi stated that an average of 2 scientists per leg was essential to ESF and that it would be too difficult for ESF to organize technicians. Von Rad said that Germany could not provide technicians and also preferred 2 scientists per leg. Taira and Jenkyns concurred. Lancelot felt that France would be able to find technicians on a case-by-case basis, but not continuously. Malpas stated that 2 participants per leg was the optimum for C-A, but that an effort could be made to find technicians.

Austin noted that 7 international partners, each with 2 scientists per leg, yielded 14 scientists. If the US was to maintain its balance, the total scientific party must remain at 28. Natland suggested seeking and hiring non-US technicians. Francis responded that ODP-TAMU had written to international partners on that subject, but that it would not solve the problem of shipboard overcrowding. Becker suggested that the US could cut 2 of its scientific participants. Malfait added that, according to the MOU, the addition of a 7th international partner did not require that the US increase its level of scientific participation. However, Meyer said that she was not maintaining US participation at 50%. She had raised the issue of <50% US participation to 4 separate panels, including USSAC, and there had been no objections.

Austin emphasized that hiring 4 extra technicians would have a financial impact on ODP-TAMU. However, Larson pointed out that replacing US scientists with technicians would reduce the JOI/USSAC budget for travel and science support. In response to a question from Lancelot, Malfait said that the MOUs specify an average of 2 participants per leg from each international partner. Lancelot suggested altering this to 1 to 2 participants per leg. Austin stressed that a decision would have to be made on where ODP-TAMU would get funds to hire

extra technicians. A short list of panel recommendations, for PCOM to prioritize, would be required first. He asked Panel Chairs to provide him with such a list before the April, 1992, PCOM meeting. It should include cost estimates, if possible, so that PCOM could prioritize at the April meeting. Pyle recalled that this had been done a few years previously. Austin stated that PCOM can make a philosophical commitment to address the problem of technical support, but that it must be realized that there will be a budgetary impact.

Shackleton asked whether extra technicians were required to collect good scientific data or just to collect more data at all costs. He suggested using scientists to do certain jobs, e.g., run the XRF. The magnetometer was already run by a scientist. Moran responded that the goal was to improve ODP. Core/log integration could not be accomplished without more technical staff. They were also required to improve consistency in physical properties measurements. Meyer added that physical properties positions were difficult to staff because of lack of available expertise in the scientific community. Furthermore, shipboard physical properties specialists were overloaded and had little time to interpret their data. It would be a good position in which to sail technicians instead of scientists. Kidd suggested the compromise of sailing graduate students in that sort of role. However, Austin noted that 20% of shipboard scientists had been graduate students. Moran stressed that physical properties, XRF and WSTP were good examples of positions where technicians were very much needed. Lancelot commented that graduate students had sailed as physical properties specialists, but that it was a tough job with little time to interpret data and technicians would be better. Natland recommended that PCOM state its philosophical intention to proceed. Larson asked how soon the recommendations would go into effect. Austin replied that ODP-TAMU would provide information to BCOM in January. BCOM might have to go back to PCOM in April. It would be a base budget item for ODP-TAMU. The money would not become available until FY93 (October 1, 1992). PCOM passed the following motion.

PCOM Motion

PCOM endorses SMP's recommendation to increase technical support staff on board *JOIDES Resolution* by up to 2 personnel/leg. PCOM requests that ODP-TAMU provide BCOM information by January 1992 on the continuing costs of hiring and staffing the ship with these additions, with commensurate reductions in scientific participation, to evaluate its impact on the FY93 budget.

Motion Natland, second Larson Vote: for 15; against 1; abstain 1; absent 1

SSP

The SSP annual report is summarized in Appendix 6. Kidd noted that little original data for programs in the North Atlantic Prospectus (NAP) was provided to SSP at its October, 1991, meeting. Data submission for review at SSP's April, 1992, meeting must be given the highest priority.

In its overview of NAP programs, SSP took on trust that those cruises that had been funded would indeed happen and that proponents had the all the data they claimed to have. AB may encounter problems with deep penetration. MS was a concept proposal. TAG may require the DCS. Survey cruises had been funded for VICAP, CR and both Vema and MARK areas of MAR.

Concerning causes for concern (Appendix 6), Kidd stressed that SSP's current responsive mode did not allow for best assessment of proposals. If data on NAP programs were received at the April, 1992, SSP meeting, this would be within 2 years of drilling. This was not a desirable situation. However, Kidd hoped that new guidelines would result in better data packages. He requested a PCOM motion on data submission and that letters be written to proponents telling them to send in their data. There were also Site Survey Data Bank requirements. Austin stated that he was prepared to write to proponents with this message. There was no dissent among PCOM members concerning this course of action.

SSP was also concerned about how to avoid PCOM scheduling exciting science for which insufficient data were available (e.g., HD). SSP would, therefore, like PCOM to provide back-up legs for FY93 programs whose data quality/quantity was questionable. This would put pressure on proponents to provide data. This might also be relevant to Arctic legs, where difficulties might arise because of drilling logistics and site-survey cruise problems. Austin noted that there were now more possibilities for back-up or alternate programs than were available during scheduling for FY92. Kidd agreed, but also stressed that it would be impossible to carry alternate programs beyond April, 1992, because this would create scheduling/staffing problems for ODP-TAMU.

SSP wished PCOM to consider the schedule of panel meetings to enable SSP to act on thematic panel input (Appendix 6). SSP guidelines were in preparation for the new ODP guide. These guidelines would include coverage of gas hydrate drilling and offset drilling. SSP requested a liaison to OD-WG.

Finally, SSP continued to be concerned about what Kidd characterized as the HD "fiasco". Austin countered that he had offered to set up a meeting between SSP and H. Dick, an HD proponent, which Kidd had declined. Kidd responded that SSP would have had no objections to HD if it had been characterized as an engineering leg. Larson asked whether PCOM could authorize drilling of sites that had not been approved by SSP. Austin affirmed that this was permissible, adding that SSP was an advisory panel; PCOM did not have to take its advice in all cases. Austin stressed that a HD data package had been aboard *JOIDES Resolution* on Leg 140, in case a move to HD had been necessary. He acknowledged that the HD situation had been an anomaly.

Kidd concluded his report by informing PCOM that 2 members would be rotating off SSP. SSP recommended a 4-year term for its members so that they could experience a complete cycle from proposal review to drilling. Austin commented that this recommendation would be considered by PCOM later in the meeting.

Discussion

Taylor supported SSP on the need to have data in the Site Survey Data Bank prior to the PCOM Annual Meeting. Legs should not be scheduled for drilling when the data are not available. Larsen felt that a communication problem existed. As NARM-DPG chairperson, he had never been informed that he should submit a data package. Austin commented that C. Brenner had been ill and would ordinarily have been more active, but that he would be resuming full involvement. Kidd felt that proponents would never submit their data until they knew that their proposal had been scheduled for drilling. Austin commented that some non-US proponents had mistakenly sent data to the JOIDES Office, instead of to the Site Survey Data Bank. Lancelot suggested that someone, probably attached to the Site Survey Data Bank, should have the duty of continuously chasing data. Austin explained that, when the JOIDES

Office notified proponents that their proposals had been included in the NAP, many revisions and addenda were received. He expected that data would come in when the FY93 schedule was publicized. Natland remarked that this situation was a predictable result of disbanding regional panels, which used to chase data. Austin reiterated that he would write to proponents of scheduled legs and back-ups to inform them of the urgency of prompt data submission.

TEDCOM

Sparks noted that TEDCOM had met only once in 1991 (in September). The gap of a year between meetings had been related to the development pace of DCS III. TEDCOM decided to wait until ODP-TAMU had sent out a detailed RFP for DCS III. TEDCOM discussed DCS, Leg 142 preparations and deep drilling studies in September, 1991, but the meeting suffered from a high rate of absenteeism, primarily among the US membership, especially the industry participants. Sparks was seeking new members and had received an encouraging response from Shell. Sparks acknowledged PCOM's assistance in finding Icelandic and USSR members, who had ideal expertise.

Sparks went on to discuss DCS issues (Appendix 7). It had been TEDCOM who first suggested use of mining drilling methods and put ODP-TAMU in touch with North Sea experts on piggy-back drilling. Since concerns were raised last year about the safety of DCS II, slingshot and drop tests had been performed with satisfactory results. SEDCO was now satisfied. The other concern, about hot fluid or gas release, was not a serious problem and could be solved by installation of diverters. TEDCOM felt that DCS II should not be condemned prematurely, particularly since DCS III would be a long-term development. TEDCOM felt that DCS II was safe, though inefficient.

An RFP for studies of DCS III was issued in June, 1991. Of 3 responses received, 2 have been followed up (Appendix 7). One of these studies involved tensioners at the surface for heave compensation (estimated cost $500,000). The other used counterweights at the seafloor and would be cheaper (estimated cost $250,000). TEDCOM preferred the tensioner option, so that compensation hardware was at the surface in case of problems. In addition, tensioners would limit axial movements between strings. However, TEDCOM recommended further study, since the consequences of the choice would be great. TEDCOM also recommended studying consequences of removing the guide horn (Appendix 7) to simplify the tensioner solution and reduce its cost.

TEDCOM was concerned that Leg 142 (Engineering/EPR) had only 35 days on site. This was short, given problems encountered on Leg 132. TEDCOM was satisfied with a number of ODP-TAMU DCS IIB developments since Leg 132 (Appendix 7). The nested DI-BHA should allow penetration of fractured material. The smaller DI-BHA had given ODP-TAMU other ideas, including reaming and also coring with the DCB. However, TEDCOM doubted that the DCB would be useful without good control of weight-on-bit. TEDCOM felt that Leg 142 had too many objectives and recommended that secondary objectives be set aside. Increased experience of operating the DCS was vital. If, e.g., 100 m of coring was achieved with time remaining on the leg, TEDCOM's recommendation would be that this be repeated, several times if possible, rather than resorting to the secondary objectives. The presence of mining drillers on board during Leg 142 was vital; TEDCOM had been informed that 2 would be present.

TEDCOM had asked for details of 3 deep-drilling sites from thematic panels. These details had been promised by January, 1991, but only those from TECP had been received then. LITHP

and SGPP data were received in May and September, respectively. PCOM had not included a deep-drilling study in its recommendations to ODP-TAMU, with the result that no deep-drilling study was underway. Austin interjected that a deep-drilling study formed part of the OPCOM recommendations. Sparks stated that TEDCOM recommended that an outside consultant be used. TEDCOM's proposed schedule (Appendix 7) envisaged completion of such a study by September, 1992, but that was based on the assumption that an RFP would have been prepared by ODP-TAMU and vetted by TEDCOM by late 1991, which had not happened.

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Continuing his report, Sparks asked why PCOM had not pursued recommendations concerning deep drilling made by TEDCOM at the 1990 PCOM Annual Meeting. He added that TEDCOM was unwilling to conduct deep-drilling studies itself. The proposed outside consultant should study deep-drilling scenarios provided by thematic panels and explore limits of drilling both with and without a riser and of mining drilling. An RFP was needed. ODP-TAMU should write the RFP, which should be vetted by TEDCOM. TEDCOM would also participate in the choice of consultant. Sparks warned that if TEDCOM's schedule was not met (Appendix 7), PCOM would continue to be disappointed with progress on deep drilling.

The 3 deep-drilling scenarios provided by thematic panels are summarized in Appendix 6. High pore-water pressures predicted at TECP's North Newfoundland Basin site, a real site, would necessitate riser drilling. In response to a question from Tucholke, Moores said that the expectation of high pore-water pressures is based on observations at other locations reported by D. Sawyer of TECP. Sparks noted that the very deep penetration (5-6 km) LITHP site involved many difficulties; SGPP's Somali Basin site would also require riser drilling.

Sparks reported that KTB was open to participation in development of the PCS sample chamber (PCSSC), but that they had not been approached. TEDCOM discussed ways of supplementing income for technology development, including joint programs with the oil industry and DEA (Drilling Engineering Association) projects. AMOCO contacts had not been encouraging about joint DCS work, but ODP should continue to pursue oil industry contacts.

Discussion

Taylor asked why TECP's deep-drilling site was so shallow. Austin replied that TECP had originally presented 2 options, but that the deeper site (drilling S-reflector off Galicia) had been deemed impossible, by G. Foss of ODP-TAMU, with existing technology. Moores confirmed that TECP's original submission had been filtered by ODP-TAMU. Taylor urged that the entire original TECP package be provided to the proposed consultant. Austin stated that PCOM would need input on potential consultants. Sparks responded that TEDCOM would advise PCOM. Storms said that he would discuss deep drilling in his report to PCOM. Sparks added that ODP-TAMU had done some studies on deep drilling. In response to a question from Natland, Humphris said that LITHP's deep-drilling scenario had been derived by combining information from holes 504B and 735B. Sediment cover was assumed, i.e, bare-rock drilling was not required.

Pyle stated that he had met with KTB representatives in the summer, and that the meeting focused on downhole measurements. They had expressed interest in cooperation, but they

were short of funds. Sparks replied that he had not been informed. Pyle said that he and Sparks should discuss further action.

Worthington characterized the DCS as crucial to ODP and recalled that a recovery rate of 99% had been predicted. He asked if that level of optimism remained. Sparks responded that DCS had worked well in a water depth of 200 m in the North Sea, but that weight-on-bit might be more difficult to control in deeper water owing to vibrational effects. More experience was required. Worthington emphasized that if DCS core recovery was low, slimhole logging would be even more vital and experience with that should be gained. Storms explained that slimhole diamond drilling obtained the best recovery of any rotary system. ODP's application of DCS technology offshore and in deep water would not achieve the same level of performance as on-land DCS drilling, but should still outperform other drilling systems. ODP-TAMU's goal was 50% recovery. Storms did not feel that anything close to 90% recovery would be achievable until drillers got used to the system. He added that the scientific community would be happy with 50%. Austin stressed that the community would settle for 50%, but that 50% should not become the new goal. He said that PCOM would return to the issue of DCS II, since a second deployment of DCS II (in FY93) had been deemed advisable by TEDCOM.

Francis commented that, while he favored collaboration with KTB on PCSSC in principle, this should be delayed until input has been received from the geochemical community. Sparks cautioned that any collaboration would have to be completed before termination of KTB in 1994. Austin pointed out that a third party in the US was working on a sample chamber. Francis noted that the PCS would have to be redesigned permit extraction of the sample and use of a sample chamber. Austin expressed concern that a communication problem might be developing regarding this issue.

Becker asked for clarification of the status of DCS IIB, recalling that PCOM had declined to schedule important programs in FY92 because of concerns about DCS II safety. The FY92 drilling schedule might have been very different if DCS II had been deemed safe. Sparks responded that he had not been qualified to comment on DCS safety at last year's PCOM Annual Meeting. Austin remarked that the slingshot test had not been performed at that time. Storms added that ODP-TAMU needed to examine the issue of well control to evaluate its hazard potential. ODP-TAMU did not want to use DCS in a potentially hazardous setting prior to performing this evaluation. Becker stressed the need to be careful about the information on which PCOM based its decisions. Austin reminded PCOM that it would have to consider potential locations for DCS IIB deployment when it defined the FY93 schedule.

Von Rad pointed out that SGPP and TECP deep drilling scenarios were not much deeper than the existing single leg record, but that of LITHP was very different. He asked whether any deep-drilling studies had been been carried out by the Ocean Margin Drilling Program (OMDP). Austin responded that OMDP studies always included a riser.

Austin asked whether PCOM should go on record empowering someone to study deep drilling and allocate funds for that purpose. However, he cautioned that OPCOM funds might not become available and that every time a study was commissioned something else must be dropped. Humphris stated that deep drilling of oceanic lithosphere had been a long-standing goal of LITHP. LITHP needed to know if 4-6 km penetration was feasible. If not, LITHP would have to adjust its long range plan. Moores added that this was also of importance to TECP. Mutter felt that a study to provide information on drilling limitations by experts in the field should be pursued. Austin remarked that maximizing capabilities of *JOIDES Resolution* was a matter of community will and not just technology. Sparks stated that even the deep hole

proposed by TECP would need an additional platform, but Mutter felt that a study was needed in order to confirm that. Natland said that there was no current capability to drill LITHP's proposed deep hole and that a study could specify what would be required to achieve LITHP's objectives. A system to proceed with such a hole should eventually be designed. Taylor expressed 2 issues: 1) capabilities of *JOIDES Resolution* (he felt that ODP-TAMU studies had covered that point and set a penetration limit of ~2500 m), and 2) what could be accomplished with additional platforms. Austin reminded PCOM that $100,000 had been allocated from OPCOM funds for a study of additional platforms. However, OPCOM funds might not arrive. He asked whether, in that case, ODP funds should be committed to that study. Natland noted that it might not be possible to use the same platform to achieve all goals. Francis recalled that he had suggested employing another engineer at ODP-TAMU, but OPCOM had decided to hire a consultant. Malpas felt that money spent on such a study was justified in view of the amount being spent on LITHP meetings, where plans were currently being made based on inadequate drilling information. Kidd pointed out that TECP's and SGPP's proposed deep holes were almost within *JOIDES Resolution's* capabilities, but Austin responded that TECP had originally proposed a more challenging site and Shackleton added that SGPP's (Somali Basin) site required a riser. Sparks said that the riser requirement was contained in the original Somali Basin proposal. McKenzie noted that a new proposal for the Somali Basin was being prepared.

Austin asked whether, because LITHP's proposed deep hole was beyond *JOIDES Resolution's* capabilities, PCOM should commission a study looking beyond *JOIDES Resolution*, adding that *JOIDES Resolution* might be gone after 1998 in any case. Austin felt that such PCOM action was warranted and Natland agreed. Sparks proposed that, given the confusion about the scope of the study, PCOM should vet the RFP at its April, 1992, meeting, rather than adhering to TEDCOM's original timetable, which required launching the study at that time (Appendix 7). Austin stated that consultation between PCOM and TEDCOM could occur by mail, etc, prior to April.

Taylor recommended that the study include the Galicia deep site as the TECP option. Austin responded that, since the study would be looking beyond *JOIDES Resolution*, it would be open to all 4 of TECP's original proposed deep sites. All thematic Panel Chairs should re-examine their original deep drilling input with this in mind. Natland asked whether the study should proceed expeditiously even if OPCOM funding did not materialize. Austin replied that the study would use OPCOM funds if those became available. If they did not, then it was important to proceed at least as far as an RFP, though PCOM might not commit to hiring the consultant. Taylor cautioned that, if the scope of the study was too large, it might not yield useful results. Sparks asked whether consultants who are members of TEDCOM would be excluded. Austin replied that they would be eligible, adding that it would be easier for PCOM to assess in-house personnel who are familiar with ODP. PCOM passed the following motion.

PCOM Motion

PCOM confirms the necessity of carrying out feasibility studies for deep drilling as soon as possible. PCOM asks ODP-TAMU to draft a RFP, in consultation with the PCOM chair, for the hiring of one or more consultants, to carry out such studies, using candidate sites recommended by thematic panels as a basis. The draft RFP will need to be reviewed by TEDCOM at its next meeting in April 1992.

Motion Natland, second Malpas Vote: for 16; against 0; abstain 0; absent 1

927. Scientific Reports of Recent Drilling

LEG 139: SEDIMENTED RIDGES

Davis acknowledged the excellent shipboard party on Leg 139 and onshore support by ODP-TAMU. Leg 139 had pushed some of the limits of *JOIDES Resolution* and of downhole tools. Juan de Fuca Ridge is a high-standing volcanic ridge with a deep axial valley, Middle Valley, at its north end. Middle Valley is filled with turbidites and was the focus of Leg 139. All of the sites were in close proximity and form part of the same hydrologic environment.

Site 855 was drilled in the hanging wall of the fault scarp that forms the eastern boundary of Middle Valley. An array of holes was drilled to intersect the fault, which dips at 45°. Recharge was found to be associated with the fault, rather than to occur through sediment.

Site 856 was drilled into a sulfide body next to an uplifted pile of turbidites above a laccolithic intrusion. At this site, 100 m of massive sulfides were drilled. An alteration gradient has been superimposed approaching the sulfide body. Uplift of the hill at this site appeared to postdate the adjacent sulfide body. The sulfide body was massive except for the upper 5-10 m, which comprised sulfide debris and rubble. It was impenetrable by APC. The chlorinity profile indicated the age of the sulfide body as being within the last 10,000 years. Age of the volcanism is indicated by sulfate profiles as being ~2000-4000 yrs.

Site 857 was drilled into an area of featureless seafloor as a background or reservoir site, which would provide information on fluids with a long residence time that feed active discharge at Site 858 (drilled into an area of active discharge above a buried volcanic edifice). Sediments at Site 857 were characterized by a high degree of vertical/horizontal velocity anisotropy (25%-30%), making depth estimates from seismic data difficult. Basement comprised alternating sills and sediment in the proportion of 2 parts igneous to 3 parts sediment. Sills were 1-25 m thick. Recovery was ~15%, but some sill/sediment contacts were recovered. The section was, in general, highly altered. There appeared to be a great deal of fluid flowing horizontally through the turbidites between the reservoir site and the discharge site. A packer experiment revealed that parts of the section were underpressured (below hydrostatic); pressure could not be significantly raised by pumping. The first 3 weeks of CORK data have been recovered by *Alvin*. It should be possible to determine permeability from the pressure recovery data. The CORK thermistor string available (300 m) was too short, since the hole was drilled to 1000 m. Hole 857D was warming up to equilibrium temperature. The middle section of the hole had recovered to a temperature thought to be higher than the equilibrium temperature, probably as a result of a hydrologic transient due to cross-talk between the CORKed hole and the nearby exploratory hole. It was found that the formation was significantly disturbed by drilling of the exploratory hole. A CORK was also fitted at Site 858.

Leg 139 provided important information relevant to future drilling in hydrothermal settings. Bit temperatures were much less than formation temperatures. Core and logging temperatures were also less than formation temperatures. H_2S concentrations were low. In buried, but cool, extrusives, recovery and penetration were both poor. In altered intrusives and extrusives, penetration was good, but recovery was poor (<5%-15%). In altered sediments, penetration was good, but recovery poor. In sulfide rocks, penetration and recovery (20%-30%) were initially good, but decreased as difficulty in lifting high-density cuttings was encountered. High-temperature tools were valuable, especially the Sandia self-recording tool, which could

be deployed "at the drop of a hat" with the coring wire. Exploratory holes are "hydrologic headaches". Attempts had been made to cement those at sites 857 and 858 without success. Exploratory holes must be drilled far from main re-entry holes to avoid serious disturbance to the latter. Grinding to obtain pore fluids worked well even at low porosities. Finally, CORK deployments were efficient, taking only 20-22 hrs.

A video showing the operation of data retrieval from Leg 139 CORKs, taken from *Alvin*, was shown following Davis' presentation.

LEG 140: HOLE 504B

Dick remarked that persistence has paid off at Hole 504B and that the success of Leg 140 was a tribute to the original proponents. Fishing tools taken on Leg 140 were not ideal as an extra and unexpected collar proved to be on the Leg 137 junk. A double-dog fishing tool devised onboard *JOIDES Resolution* was finally successful in recovering the junk. Dick felt that the decision to run the FMS first in order to gain at least some results from Hole 504B involved unwarranted risks. The FMS was a soft formation tool and parts of it were lost. Worthington responded that this was misleading since the FMS has been run successfully many times. Risks must be balanced and tools must be run if there was no reason to expect failure. Lyle added that it might be considered better to risk junking the hole at the beginning of the leg, when both time and equipment are available to clear it, than at the end of the leg.

Dick noted that the average rate of penetration during Leg 140 had been 15 m/day, the same as on legs 111 and 137 (Appendix 8). Recovery rate remained generally constant down the hole, with the exception that whenever crystal grain size increased, recovery rate increased (to 50%-60%), decreasing again when grain size decreased. This was due to fine-grained units being more fractured and veined than coarse-grained units, and was the reason that high recovery was expected in the gabbros of Layer 3. The Drilling Superintendent on Leg 140, E. Pollard, was outstanding. He made correct decisions in many difficult situations. Dick stressed the importance of having an excellent Drilling Superintendent. Hole 504B was terminated at 2000.4 m.

Temperature perturbations identified on Leg 137 were found to be subdued on Leg 140 (Appendix 8); Hole 504B appeared to be "breathing". "Crystal clots", of adhered coarse-crystal grains, were recovered. These suggested existence of some sort of large crystal mush zone and perhaps indicated that the magma body was small. Densities were approaching Layer 3 values and porosities were approaching zero downhole (Appendix 8). Seismic velocities rose and then fell downhole, suggesting that any seismic reflector at the Layer 2/3 boundary was the result of a velocity inversion (Appendix 8). A novel approach to core description had been employed during Leg 140, with 1 scientist responsible for each type of observation. This promoted consistency in observations of, e.g., grain size. A coarse/fine grain-size cyclicity suggested episodic injection of dike swarms (Appendix 8). In response to a question from Malpas, Dick said that dikes dip at 70° and are ~0.5 m thick. Therefore, ~80 were encountered in the 400 m drilled.

Dick stated that horizontal and vertical fractures encountered (Appendix 8) appeared to be drilling-related. Zinc concentrations decreased downhole (Appendix 8), suggesting that lower rocks are the source of zinc found higher in the section and in black smokers. Dick added that he expected to see this trend with other metals as penetration increased.

A total of 86 days had been spent drilling at Hole 504B, with 56 days of downhole experiments. Therefore, in effect, only 2.5 legs of actual drilling had been expended. Dick felt that this should provide a new perspective on deep drilling and that spending 3-4 legs/hole on deep holes in oceanic lithosphere was not unreasonable. He recommended an early return to Hole 504B.

Discussion

In reply to a question from Moores, Dick said that there had been no evidence of faults. Moores speculated that they might have been present in the 87% of the section that was not recovered. However, Dick noted that no mylonites were present as fragments. Responding to a question from Tucholke, Dick said that he believed that the bottom of Hole 504B was now very close to the Layer 2/3 boundary. Natland asked about BHTV and caliper results. Dick replied that he did not yet have the BHTV results and could not, therefore, describe what they revealed about dikes. He added that Hole 504B had been left in good condition, reamed and without junk. Worthington asked whether Leg 140's 12.8% recovery rate was sufficient to answer scientific questions; Dick replied that it was.

Lyle commented that stress directions at the bottom of Hole 504B were the same as at the top. Francis said that, according to ODP-TAMU, spalling of borehole walls did not appear to have occurred and that the pillow lavas were the main source of fragments. Ideally the hole should have been cased through the pillow lavas. Dick responded that that was not quite true, since there were some breakouts just above the bottom of the hole.

Malpas asked how many chilled margins had been recovered and on what information Dick's assertion that the dikes dip at 70° was based. Dick replied that 2 chilled margins had been recovered that dipped at 70°.

928. Report of the Annual Panel Chairs' Meeting (PANCHM)

PANCHM minutes were handed out and a revised version is included as Appendix 9. Humphris, *pro tem* chairperson, reported that PANCHM supported discontinuation of supplemental science, but that it still supported proposals for less than 1 leg of operations that could be built into legs at an early stage of planning. They should go through regular panel review and thematic panels would package them into single leg programs before incorporating them into a fall prospectus. Panels should consider with which legs short proposals might be merged, with a view, where possible, to forming an integrated program.

While recognizing the need to preserve fairness and openness and avoid conflict of interest, panels preferred a more proactive role in generating proposals. However, PANCHM expressed concern about excluding panel members who are proponents from voting and ranking because of potential loss of expertise. Proponents must be clearly identified and prevented from voting for their own proposals, but should be involved in ranking others. Panel Chairs should prevent lobbying by proponents in support of their proposals. Proponents could be asked to leave the room at the discretion of the Panel Chair.

PANCHM recommended that the JOIDES Office remove the numbers from the ranking boxes on proposal review forms. Thematic panels used these boxes as an indication of relevance to panel interests and would prefer to distance themselves from the idea that 1 meant poor and 5

meant excellent. PANCHM felt that voting and ranking procedures should be standardized. Already, 3 of the thematic panels use similar methods. For the spring, 1992, global ranking, thematic panels would use their own methods, but all would use a standard method in the fall. Each thematic panel would decide which proposals in the prospectus they would rank. Each panel member would rank proposals (excluding any of which they are proponents) and voting totals would be adjusted based on the number of panel members allowed to vote on each proposal.

PANCHM recommended that the JOIDES Office set new deadlines for receipt of proposals for panel review: January 1 for spring meetings and August 1 for fall meetings. Deadlines for specific years of drilling were rejected because PANCHM did not wish to destroy the image of spontaneity. A proposal size limit was also rejected because PANCHM felt that proponents should have the opportunity to include all of their information. In particular, PANCHM did not want proponents to leave out data.

During their fall ranking process, thematic panels needed to assess which proposals are "drillable" in the time frame that will be considered for scheduling by PCOM at its subsequent Annual Meeting. This would help PCOM judge which proposals were ready for inclusion in the prospectus. Furthermore, since SSP was not getting data in time, a new meeting schedule was proposed by PANCHM:

Panel	**Spring Meetings**	**Fall Meetings**
Thematic	Late Feb./early March	Mid-October
SSP	Early April	September
PCOM	Mid-late April	Late Nov./early Dec.
Primary Activity:	*Global ranking/ drillability*	*Prospectus ranking with SSP input*

SSP would impose an August 1 deadline for submission to the Site Survey Data Bank of available site survey data for globally highly-ranked proposals likely to be included in fall rankings. This would enable SSP to provide feedback to panels for their fall meetings and prospectus rankings.

PANCHM endorsed efforts of SMP, DMP and IHP concerning core/log data integration and supported their action plan to address this issue.

PANCHM discussed developments in logging, sampling and other areas. Panels would produce a combined, prioritized short-list of non-engineering needs. This list would be presented for discussion by PCOM at its April, 1992, meeting. Revised lists would be submitted annually for subsequent PCOM spring meetings.

PANCHM encouraged international partners to send alternates to panel meetings when the member could not attend.

PANCHM was sympathetic to SMP's concerns about shipboard technical support. The JOIDES Office should inform co-chiefs to pay attention to technical staff requirements for their legs and to look for technical expertise in the scientists they invited.

PANCHM was interested in helping a feasibility study of deep drilling to progress and was willing to provide liaisons.

PANCHM requested an increase in the level of financial support provided to Panel Chairs to $2500/yr. The level of support had not increased for many years and each meeting now cost panel chairs about $1000 in copying and mailing costs alone. Each Panel Chair also needed secretarial support at a level of ~20% of full time. (Some international partner panel chairs already got this.)

Discussion

Natland thought that a mechanism for incorporating short proposals should be set up. Humphris suggested involving proponents or DPGs. Austin stated that proponents would be informed early that many of these issues lay with them. This was the reason for specifying drillability.

Cowan commented that, as a PCOM member, he valued thematic panel reviews highly, Thematic panels might become more proactive, but he emphasized that what they already did was very valuable. Larson echoed Cowan's statement, adding that it was important to be both proactive and fair. He felt that the PANCHM course was fair; after all, ODP was a "user's program". Tucholke asked whether PANCHM had discussed the present system of proposal review. At present, reviews were based on maturity and thematic relevance, but what about proposal quality? Humphris replied that PANCHM had discussed that last year and had dropped the mature/immature boxes on proposal review forms. Thematic panels were also trying to be more blunt in their reviews. Tucholke felt that proponents were not sure whether they were being encouraged or not. Shackleton believed that very few proposals were so boring that ODP would never wish to drill them. The thematic panels needed to see rewritten proposals, to see how good the proposals could be, before they could be judged. Those of more questionable quality tended not to be rewritten anyway. Von Rad felt that it was important, especially for non-US proponents, to receive a letter explaining that ODP was a competitive program and that there was no guarantee that even good proposals would ever be drilled. Blum noted that the JOIDES Office already sent a cover letter saying that. Natland pointed out that ODP proposals were not treated like NSF proposals. Proponents needed to know where they stood in the rankings. Austin said that information was already being transmitted well. He expressed concern about making too strict a cut-off and discouraging proponents. However, Tucholke countered that if proposals unlikely to be drilled were not cut at an early stage, there was a risk of disappointing proponents. Mutter expressed agreement with Tucholke. Moores stated that TECP's watchdogs were empowered to tell proponents what they must do to interest TECP. Kidd confirmed the effectiveness of TECP's system. Austin commented that he did not feel ready to start rejecting proposals, though he acknowledged that that might be necessary at some future date. Taylor pointed out that proposals often needed further site surveys. If the proposals were rejected outright, the site surveys will not be funded. Austin agreed that ODP played a vital role in the funding of surveys. Mutter and Tucholke suggested informing proponents that their proposals would not be considered further until they had satisfied certain requirements. Austin replied that the panels could do that, but they must provide information to proponents and not just check a box. Shackleton said that the panels already did that.

Taylor observed that, concerning the meeting schedule, the focus seemed to be on the fall meetings. He asked whether the system was sufficiently efficient at getting information to the

spring meetings. Humphris said that PANCHM felt that site survey information was most critical for planning of the 1-year ship schedule, but was of less concern for spring meetings.

Austin stated that he would ask for PCOM endorsement of PANCHM's recommendations by consensus, but first he thought it important to discuss the issue of having proponents present during panel discussion of their proposals and allowing Panel Chairs to make the distinction between simple provision of information by proponents and lobbying by them. In addition, he asked whether this should be extended to PCOM. Taylor suggested that proponents be restricted to answering questions about their proposals. Malpas agreed, but added that proponents should be allowed to correct misinformation without being asked a question. Austin was sympathetic to the PANCHM recommendation, noting that problems had arisen recently because individuals were excluded during panel rankings. PCOM would need to consider this matter before it set the FY93 schedule. Duncan suggested that PCOM would need an impartial chair for that part of the meeting and Austin agreed.

Austin felt that the PANCHM meeting had been most productive and that PANCHM chairperson, Humphris, had done an outstanding job. PCOM reached the following consensus.

PCOM Consensus

PCOM thanks the Panel Chairs and endorses PANCHM's recommendations.

929. Annual Reports by Thematic Panel Chairs

Austin explained that thematic panel reports would not include NAP rankings, which would be presented later.

LITHP

Humphris reported that LITHP met twice in 1991, once jointly with TECP (Appendix 10). Moores would discuss the joint meeting, a highlight, in his TECP report.

Humphris described LITHP's planning activities, beginning with deep drilling. LITHP's short-term strategy involved drilling of a number of scientifically-significant holes of intermediate depth (2-2.5 km?) in different settings (e.g., crust formed by fast and slow spreading, on- and off-axis sites, etc.). This approach would maximize the capabilities of *JOIDES Resolution*, maintain the pace of technological advances, and increase knowledge of the challenges involved in very deep drilling. LITHP's long-term deep drilling goal was to drill a 4-6 km hole. LITHP prepared 6 deep-drilling scenarios in the fall of 1990 and subsequently combined these into a single site, based largely on data from holes 504B and 735B. LITHP was pleased about allocation of OPCOM funds for a deep-drilling feasibility study and suggested that the study address issues of time and technology requirements, and costs of drilling both a 4 km and a 6 km hole. LITHP could then rewrite its white paper, if necessary. D. Moos was designated LITHP contact for the feasibility study.

Offset drilling constituted a second approach to LITHP's objectives. OD-WG was formed at PCOM's April, 1991, meeting. LITHP was disappointed that it had not happened sooner. A

consequence of the delay was that OD-WG's deliberations had only just begun as North Atlantic scheduling was occurring. LITHP would like OD-WG to become a DPG at its next meeting and be specifically charged by PCOM with developing an initial drilling strategy for the Atlantic and laying out a provisional schedule for Atlantic drilling with specific sites. LITHP requested PCOM action on this issue.

LITHP was pleased that DCS was given top priority by OPCOM, and also that funds were devoted to logging and fluid sampling development. Humphris added that it was now clear from the success of Leg 139 that some objectives could be accomplished with conventional techniques.

Humphris went on to discuss supplemental science. LITHP was strongly in favor of S-2 (logging of Hole 801C) and was prepared to give up 3.5 days of basement drilling from Leg 144 to accomplish S-2, so long as this time was not taken from planned basement drilling at MIT-1. However, Humphris understood that drilling times had now been changed (including those at MIT guyot) and that there might no longer be 3.5 days to give up. S-3 (OSN-2) represented a high priority of LITHP. Installation of new seismic observatories should be included in implementation of the LRP. However, there was not enough drilling of LITHP interest on Leg 145 to yield the originally-required "up to 10 days". LITHP was prepared to give up its Leg 145 basement objectives to accommodate S-3 because Leg 145 did not address high-priority objectives of LITHP. However, LITHP felt that it was unacceptable to devastate Leg 145 by removing so much time. Furthermore, S-3 (now 5.7 days) still did not meet the original time limit of 4 days for supplemental science proposals.

LITHP recommended formation of a TAG-DPG to examine all available data to determine and prioritize locations of appropriate drilling sites, and also to consider how to address structural controls on hydrothermal systems through drilling.

There had been a large number of membership changes (5) during the past year. LITHP and TECP both felt that their interests were well represented on both panels.

Humphris concluded by informing PCOM that she would be leaving Sea Education Association in January, 1992, and would subsequently work in the RIDGE Office at WHOI. She asked whether that raised any concerns for PCOM. Austin replied that the change would not involve any conflict of interest.

TECP

Moores reported that TECP met twice in 1991, the second meeting jointly with LITHP in Cyprus.

One of TECP's overriding concerns was the great breadth of its charge. TECP was beginning to come to grips with the fundamental question of how to solve tectonic problems by drilling. TECP saw drilling as one of many techniques for studying tectonics, including mapping, use of submersibles, seismics and cross-sections (accurately scaled to the best extent possible). An additional panel concern was narrowness of focus in drilling proposals and lack of structural-tectonic considerations in many that could incorporate them. Moores stressed the need for interdisciplinary teams. TECP's final overriding concern was that routine shipboard collection of structural information from appropriate cores be carried out.

Additional actions and concerns arising from TECP's March meeting were: 1) shortness of Leg 141 (CTJ); 2) immaturity of HD site-survey information (however, TECP felt that, though drilling at HD may fail to penetrate the Moho, any hole there would yield new information; TECP, therefore, favored HD drilling); 3) lack of tectonic focus in the A&G program; 4) overall quality of proposals and the Etheridge checklist, which was discussed and edited (and published in the June, 1991, *JOIDES Journal)*; and 5) appointment of watchdogs.

A number of actions and concerns also arose from the October meeting in Cyprus. Moores went on to discuss these.

The Troodos complex provided an excellent model of oceanic crust and mantle and good ground truth for offset drilling. In addition, the field trip to the ophiolite, which preceded the joint TECP/LITHP meeting, enabled TECP/LITHP panel members to get to know one another better and improved coordination at the meeting.

With respect to OPCOM, TECP felt that many high-priority sites required deep drilling. The capabilities of *JOIDES Resolution* should, therefore, be maximized to achieve increased efficiency of drilling, enhance core recovery and increase the chance for success at deep sites.

TECP gave high priority to supplemental science proposal S-2 (logging Hole 801C) and would be prepared to give up basement penetration at mid-latitude A&G sites. S-3 (OSN-2) was also given high priority. TECP would be prepared to give up tectonics objectives (age and paleolatitude information at seamounts) of Leg 145, which were, unfortunately, secondary on that leg. However, TECP would like to preserve Detroit Seamount sites. TECP's priorities on Leg 145 were, in decreasing order of importance: 1) Detroit Seamount sites, 2) NW-3 basement, 3) PM-1, NW-1A, NW-4A basement.

Letters of intent received considerable discussion at TECP. It was felt that they are useful for stimulating exciting proposals and might usefully be treated more formally. TECP also supported LITHP's recommendation to change OD-WG into a DPG.

Reports of TECP watchdogs on the status of tectonic themes and areas of expertise of TECP members are summarized in Appendix 11. Moores requested that Sawyer and Purdy be allowed to remain on TECP for 1 more meeting, because of the need for their expertise.

TECP would like to have future meetings in regions where field trips could be used creatively to examine on-land exposures of oceanic features. The spring meeting would be in Las Vegas, NV, with a field trip to continental rifting features. For future meetings, a volcanic rifted margin site would be sought (perhaps the Late Precambrian of Virginia or North Carolina. Moores echoed support for the recommendation for increased financial support for Panel Chairs made by PANCHM.

Publication of articles on ODP in *GSA Today* was proceeding. An article on hotspots by R. Duncan had been published in the October issue and one on accretionary prisms by C. Moore, A. Taira and G. Moore was to be published in the December issue. Planned articles include: J. Malpas on Hole 735B and the ophiolite model, M. Leinen and others on Arctic gateways and J. McKenzie on dolomites.

Moores went on to discuss the TECP/LITHP joint meeting, held in Cyprus in October, 1991. Topics of discussion are listed in Appendix 11 together with an outline of TECP/LITHP common objectives.

Discussion

Natland expressed the view that TECP liked to grapple with grandly-stated objectives, rather than drilling legs and examination of data. He felt that the objectives were often unrealistic or, alternatively, it was difficult to see how drilling would yield tectonic information. Natland urged TECP to identify projects that are workable legs. In response, Moores asked whether it was TECP's responsibility to generate drilling proposals or to respond to proposals that are sent to it. TECP had chosen the watchdog route. When TECP encountered proposals which had potential tectonic interest, watchdogs communicated with proponents. Taylor thought it would help the community if TECP provided information on how proponents could respond to TECP's recommendation that they needed to include more tectonics in their proposals. Moores replied that most of TECP's proposal reviews contained specifics and directed proponents to the appropriate watchdog. Tectonic themes had come late to ocean drilling. They required more extensive pre-drilling surveys.

Tucholke felt that Moores had made an important point. Most tectonic objectives were 3-dimensional, whereas ODP had been a 1- to 2-dimensional program. Nobody was willing to come to grips with that; extensive 3-dimensional site surveys and drilling programs were required. Austin recalled that the EPR program was originally designed as an array of holes. This approach was abandoned when it was realized that a single hole might take ~250 days! He reiterated that drilling of 3-dimensional programs was an issue of community will.

Mutter applauded the recommendation that stress measurements be made on continental margins. He asked how deep the required holes should be. Austin quoted M. Zoback as specifying 100 m, but that this depth was in off-axis oceanic lithosphere. Moores wished to defer an answer until he could discuss the issue further with Zoback.

OHP

Shackleton began with a report on Leg 138, which had achieved all its objectives and been a great success. True 100% recovery was demonstrated in multiple holes. Bio- and magneto-stratigraphy were excellent. High-resolution GRAPE density, magnetic susceptibility and color records were obtained. Scientific objectives that would be addressed using the 35,000 samples taken included: history of the ocean current system, upwelling/productivity history, atmospheric transport, and astronomical calibration of the timescale into the late Miocene. Shackleton listed planning implications of Leg 138. The digital color scanner had been a success and should be standard equipment aboard *JOIDES Resolution.* Designation of a stratigraphic coordinator and a core-log integration scientist had proved useful. The shipboard computing system must be upgraded to handle the huge increase in data gathered. Recovery rates using the APC would be improved with better heave compensation and the phenomenon of core stretching must be understood. XCB disturbance should be reduced.

OHP had reviewed a good number of proposals and had been happy with their quality. OHP welcomed good input from the outside community and hoped that ODP would remain remain responsive and receptive to proposals and not become locked into long, preset programs. However, Shackleton acknowledged that it was easier for OHP to be purely responsive than

for, e.g., TECP. Several new (late 1991) proposals would probably be highly competitive in the spring, 1992, rankings. At OHP's October meeting, 2 new proposals contained exciting science with components that some on OHP thought should be scheduled immediately: 1) Bermuda Rise (proposal 404), 1 APC-only site, very high-resolution record; 2) Hatton-Rockall (proposals 406/372), 1 APC-only site. OHP considered preparing a proposal to study intermediate water depths that would involve sites all around the world. Hatton-Rockall was an example of how such a program might be implemented. OHP considered that the Chicxulub crater, K/T boundary proposal (proposal 403) could be drilled now, but could also be improved. OHP was looking for proposals to study sequences that would enable astronomical calibration of the timescale, which might be achievable to 100 Ma.

Shackleton addressed some aspects of OHP's spring, 1991, ranking. The top 2 proposals were North Atlantic proposals and would be considered later by PCOM. The third-ranked proposal, Angola/Namibia upwelling, was of high OHP interest. Number 4 (CR) was a solicited proposal and number 5 (Shatsky Rise) would rise to number 1 when OHP thought that it was technically feasible (it involved chert/chalk drilling).

OHP remained convinced that supplemental science proposals were a good thing, but was sympathetic to PCOM's scheduling problem. The 3 supplemental science proposals had received a fair hearing. If S-3 (OSN-2) was scheduled, the following would have to be removed from Leg 145: 1) NW-4, 2) PM-1, 3) deep part of DS-1, 4) deep part of DS-3. Leg 145 was constructed by CEPAC, at OHP's request, from 3 proposals. Eliminating 1) would eliminate 1 proposal completely and eliminating 2) would eliminate the science of highest interest to the appointed co-chief, Rea. Shackleton, therefore, felt that it would be unacceptable to eliminate either 1) or 2). This left 3), which would mean eliminating the Paleogene opportunity, and 4), which would mean eliminating the Mesozoic opportunity. Both were potentially very exciting: DS-1 should provide a high-latitude, Paleogene carbonate record and DS-3 should provide a record into the mid-Cretaceous. However, OHP was ready to work with the co-chiefs to eliminate drilling. PCOM should perhaps have been more firm with the 4-day guideline, under which circumstances supplemental science might have worked. OHP was disappointed that no Santa Barbara Basin supplemental proposal was submitted in time, but that was not PCOM's fault.

Shackleton was leaving the panel and would be replaced by Delaney as chair. A true paleoceanographer was needed to replace Mix. Since both Berggren and Shackleton were leaving, OHP was losing its "grey hairs" and would prefer not to have 2 young replacements.

Discussion

Natland asked whether the Bermuda Rise and Hatton-Rockall proposals should be incorporated as short proposals, as PANCHM had suggested. Shackleton replied that was possible or, alternatively, OHP could package them as a leg, perhaps in conjunction with other panels, adding that PCOM needed to see them as a 1-leg program to be able to schedule them. PCOM could not be expected to combine them.

Francis stated that it would be difficult for ODP-TAMU to purchase and operate a color scanner in time for Leg 145. The easiest alternative would be for Mix's scanner to go on that leg. He agreed that color scanner data was important, but ODP-TAMU was pressed to buy other equipment. Austin noted that this would be one of the items on the panels' prioritized list.

Natland asked about the philosophy of OHP's ranking. He wished to gain a perspective on the ranking in the context of the larger goals of OHP. Shackleton replied that OHP has tried to complete a set of transects, both vertical and horizontal, through the Neogene. Most of that had been accomplished. The next focus would be to address the Paleogene. OHP wanted the CR program to include a Paleogene component. Shackleton added that the new chair might have a different perspective. Austin asked whether Delaney had the same sense of OHP's plans. Shackleton answered that he believed she did.

SGPP

McKenzie noted that SGPP had met 3 times in 1991 (March at ODP-TAMU, June at LDGO and November at ETH-Zürich). The March meeting had included a very valuable gas hydrates workshop, convened by E. Suess and K. Kvenvolden and attended by scientists, industry personnel and loggers. The June meeting had been held jointly with DMP and had discussed SGPP's downhole tool needs. In November, SGPP had focussed on proposal reviews.

SGPP had carried out 2 proposal rankings in 1991 (see August, 1991, PCOM minutes for details). McKenzie recognized this as an error on the part of SGPP, but emphasized that it had been done in good faith. McKenzie stressed that there was never a hint of impropriety in SGPP's actions. The second ranking in June was performed with a view to assisting PCOM because the March ranking was viewed by SGPP as being flawed; some proposals of high-priority to SGPP had ended up being ranked low. McKenzie added that multiple rankings would not recur.

McKenzie highlighted the leadership of E. Suess, past SGPP chair. She said that his guidance had been invaluable and would be sorely missed by SGPP.

SGPP had 5 main themes: sea level, fluids, metallogenesis, paleocean chemistry and sedimentary mass balance. The breadth of these topics meant that further flukes in rankings might occur in the future, since ranking inevitably depended on who was present at meetings. McKenzie characterized SGPP as a very diverse group, but harmonious.

Diversity of themes required diversity of expertise. SGPP would like to extend the term of Christie-Blick. It was very important that the replacement for Dreiss be a hydrologist. German and UK rotations were bringing 2 new organic geochemists onto SGPP, so that the replacement for Prahl need not be an organic geochemist. McKenzie noted that, since Suess had been a member-at-large, SGPP had lost a member with his rotation off the panel.

The interaction of natural gas hydrates with the thermal and fluid regimes of continental margins and in particular accretionary complexes is the highest scientific priority of SGPP. The concept of gas hydrate drilling always rose high in SGPP's rankings. The gas hydrates workshop addressed scientific and technological issues associated with gas hydrate drilling. While SGPP's 5 main themes were, in general, well covered by proposals, there was a need to put together or solicit a proposal for a dedicated gas hydrates leg. A note requesting submission of gas hydrates proposals was published in the October, 1991, issue of the *JOIDES Journal*. A working group on gas hydrates existed within SGPP. Following up on tool developments of importance to gas hydrate programs, SGPP sent a liaison to the August, 1991, meeting on *in situ* pore-fluid sampling (see DMP). Results of Leg 141 (CTJ) and Leg 146 (CA) would be important for future gas hydrate planning.

SGPP agreed with PCOM's decision to discontinue supplemental science, but supported continued consideration of proposals for <1 leg of operations and incorporation of "emergency" cases into the ship schedule. S-2 (logging of Hole 801C) was an example of the latter. SGPP supported S-2, if logging time was taken from basement objectives as recommended by LITHP/TECP. S-3 was outside the mandate of SGPP. Nevertheless, since no instrument had yet been installed in OSN-1, SGPP felt that there was little urgency for drilling OSN-2. Furthermore, S-3 exceeded the 4-day limit originally placed on supplemental science. Finally, SGPP felt that OSN might be able to make use of holes with re-entry cones previously drilled by ODP. Therefore, SGPP did not support S-3 (OSN-2).

Progress in technology was a continuing concern, particularly *in-situ* fluid sampling, porosity and permeability measurement, and recovery of sand and unconsolidated sediment. SGPP was trying hard to achieve a balance between being reactive and proactive. SGPP covered a wide range of themes and reviewed most proposals submitted to ODP. Longer meetings might help. Identification of gas hydrates as a major priority was one way in which SGPP had taken an active role. McKenzie felt that, in terms of SGPP's activities, the scales had been tipping toward the geochemical side of SGPP's mandate and that a greater sedimentological balance was needed.

Discussion

Natland asked whether SGPP had any scientific interest in logging Hole 801C. McKenzie replied that physical properties measurements on the oldest oceanic crust were important. SGPP would like the packer experiment at Hole 801C to be given a higher priority than geochemical logging.

Shackleton asked whether SGPP's sedimentological membership should be strengthened to tip the balance away from geochemistry. McKenzie felt that membership was already balanced. Austin noted that there had been arguments for a geochemical panel. SOHP was split because its mandate was too broad. He asked whether a further division was necessary. McKenzie suggested waiting a few more years. Many problems had been solved. Austin pointed out that SGPP had done more than other panels in elucidating the expertise of its members and urged other thematic panels to do so.

Von Rad wondered whether further discussion of short Atlantic proposals (e.g., Bermuda Rise and Hatton-Rockall) might be required. Austin said that he would like thematic panels to do more to integrate such proposals. He cautioned that such operations could end up requiring a week, instead of 1 or 2 days. Larson, noting that supplemental science was really "take-away" rather than "add-on" science, asked about the ruling on leg length. In the past it had been necessary only to maintain a 56-day average leg length, while individual legs might vary in length. Francis said that restrictions on leg length were a question not only of SEDCO's objections (SEDCO wants to balance the sea time of its 2 crews), but also of the turnover rate of ODP-TAMU's technicians. In addition, personnel efficiency and safety deteriorated over long periods at sea. Long legs could only be tolerated when there were very good reasons, as in the cases of, e.g., Antarctic drilling, NPT and EPR, where transits were long. Natland felt that Francis had been less flexible about leg length at previous PCOM meetings, and Mutter agreed. Francis denied that he had changed his position. Leg length could be varied, but there was a price to pay. Larson asked whether ODP-TAMU would accept a series of legs with different lengths, such that the average was 56 days. Francis replied that ODP-TAMU could live with it, but that legs must be planned so that one crew did not end up with all the long legs. Larson felt that could be done. Lancelot recalled that he had suggested sharing the load of

supplemental science among several legs, but that Francis had said that was unacceptable (see August, 1991, PCOM minutes). PCOM needed to know the boundary conditions. Francis said that it was also important to prevent legs from becoming too long and that he felt the same way as before. Storms added that there were always perturbations to leg length, but that these should be avoided. ODP-TAMU was opposed in principle to a series of 50-day and 60-day legs which average 55 days.

Shackleton requested that PCOM consider von Rad's question. Each of the Atlantic legs will have ~4 more days of science than FY92 Pacific legs because of shorter transits. Short proposals should, therefore, be considered. Von Rad stated that PCOM should plan legs; PCOM could not ask OHP to do it. PCOM could fit a short proposal into any leg. Austin said that supplemental science was more complex than leg length, involving problems with staffing and publication of results. For these reasons, PANCHM decided that panels must do some integration first. Austin added that PCOM did have some flexibility in leg length. Francis said that it was up to ODP-TAMU, subject to contractual and safety obligations. The rule was approximately 8 weeks. Austin responded that there was flexibility there. Taylor noted that Francis' strongest statement was against rescheduling already-planned legs, since that affected staffing and port calls. It was easier to be flexible about future legs. Austin still felt that thematic panels should perform more of an integrative function, but that PCOM should retain the flexibility to accommodate opportunities.

930. Reports of Detailed Planning Groups / Working Groups

NAAG-DPG

Since the NAAG-DPG chair, W. Ruddiman, was absent, Shackleton gave the report. NAAG-DPG was formed to integrate 3 highly-ranked proposals. A single, good, coherent program had emerged, comprising 2 legs to be drilled in different years. The Norwegian Sea area, with its sills, was very important for understanding how the whole ocean worked; it was not simply a regional problem. Controls were subtle. The NAAG program would also study the early history of Northern Hemisphere glaciation and would yield important information on sediment budgets. The report of the NAAG-DPG was handed out at the April, 1991, PCOM meeting and was published in slightly abridged form in the June, 1991, *JOIDES Journal.*

Shackleton stressed the importance of the weather window for NAAG drilling. OHP felt that the 2 NAAG legs should not be in adjacent years. It would be preferable to evaluate the results of the first leg before scheduling the second. It was conceivable that the results of the first leg might be so good (or so bad) that there might be no need to return. In addition, the delay would provide time for incorporation of new proposals.

Discussion

Austin reminded PCOM that NAAG-DPG no longer existed, so that the program PCOM must evaluate would not evolve further. Duncan asked what the consequences would be if the second leg was not drilled. Shackleton replied that the highest-priority sites would be drilled on the first leg. If all of the highest-priority objectives were achieved by the first leg, OHP would still want the second leg, but OHP felt that it should follow the first by 2 years. Francis stated that an ice study had shown that the chance of reaching some sites was very low. Larsen agreed, and felt that the NAAG-DPG report was too optimistic. Austin pointed out that, with 2 legs worth of sites to choose from, a lot of alternates were available. Shackleton added that if

the first leg failed to reach the northernmost sites, there would be a second chance in 2 years. Larson cautioned that if the second leg was delayed too long, *JOIDES Resolution* may have left the Atlantic. However, Shackleton said that OHP would be able to make recommendations on the timing of the second leg based on PCOM's 4-year planning.

Von Rad asked about possible overlaps with volcanic rifted margin drilling off east Greenland. Shackleton said that objectives of the NAAG and NARM programs were sufficiently different that NARM sites would not be optimal for NAAG studies. There were dangers in attempting to combine sites. Austin agreed, noting that that had happened on Leg 104.

NARM-DPG

Austin reminded PCOM that NARM-DPG had not yet been disbanded. This should be kept in mind when evaluating the report.

Larsen stated that NARM-DPG considered 12 proposals: 10 volcanic margin proposals, of which 4 were included in the NARM-DPG report, and 2 non-volcanic margin proposals, both of which were included in the NARM-DPG report (Appendix 12). (The NARM-DPG report was also included in the NAP.)

NARM-DPG balanced drilling between volcanic and non-volcanic margins. It selected the Newfoundland Basin and Iberian Abyssal Plain conjugates as the non-volcanic priority. Volcanic margin drilling plans were not based on a conjugate approach; rather, drilling targets were selected at 3 offsets from a supposed mantle plume.

The main questions to be answered by rifted margin drilling were related to the causes and consequences of breakup: 1) crustal nature and deformation of the lithosphere around rifted, divergent plate boundaries, 2) the role of mantle plumes in continental breakup and the structure of the plume, and 3) symmetry and asymmetry in structure, depositional environment and subsidence across the former breakup and rift zone.

Two end-members of rifted margins had been recognized: 1) volcanic, thick-crusted, and 2) non-volcanic, thin-crusted. The number of volcanic margins recognized worldwide had been increasing as more data had been collected (Appendix 12). NARM-DPG was charged with considering the North Atlantic, but did look at other areas around the world. The reasons for focusing on the North Atlantic were: 1) it was the location of a concentration of highly-ranked proposals representing a large scientific community and mature drilling strategies, 2) very large databases were in hand (including DSDP and ODP), 3) additional site surveys were scheduled or in progress and it was an easily accessible region, 4) Atlantic margins were the traditional type examples of super-continent breakup, 5) the Atlantic provided access to conjugate rifted margins that can be precisely matched, 6) the Atlantic offered type examples of both volcanic rifted margins and non-volcanic rifted margins without evaporites and with limited post-rift cover, and 7) important gateway and high-latitude drilling would be accomplished simultaneously.

The 2 types of rifted margins required 2 drilling strategies. The approach to thick-crusted volcanic margins would involve investigation of: 1) volcanic and geochemical development of anomalous igneous crust, 2) offset dependence and symmetry in relation to plume center, 3) syn-rift environment, emplacement mechanism and emplacement rate of volcanics, 4) crustal accretion rate and rate of deformation within anomalous crust, and 5) subsidence of the

anomalous crust and the accretionary plate boundary. The fundamental strategy was the drilling of margin transects at different plume-center offsets.

The approach to thin-crusted, non-volcanic margins would involve investigation of: 1) nature and deformation rate of deeply-subsided and thin-crusted areas (are simple-shear detachment faults present?), 2) syn-rift environment, rift asymmetries, 3) subsidence history, 4) detailed location of the ocean-continent boundary, and 5) composition of earliest oceanic crust. The fundamental strategy was the drilling of conjugate margin transects.

NARM-DPG had proposed ~8 legs of drilling (Appendix 12), ~4 legs for each type of margin. NARM-DPG would like 2 legs/yr (1 volcanic and 1 non-volcanic) in each of FY93 and FY94 (Atlantic drilling), with the remaining 4 legs to follow a break for digestion of initial data and delayed until *JOIDES Resolution* returns to the North Atlantic. The first 2 legs would provide constraints on some first-order questions and fundamental assumptions. The following 2 legs would involve the first symmetry studies. The second wave of drilling (last 4 legs) would detail margin structures, offset and symmetry studies as required for advanced quantitative modelling. Each leg would produce original results that are not dependent on, but may receive added value from, later drilling.

Volcanic rifted margin drilling would involve 3 transects, 2 symmetric to the plume, 1 closer. Since the plume was still there (Iceland), a modern reference frame was available. The plan was to extend studies from the 10% of breakup volcanism onshore to the 90% offshore. Seaward-dipping reflectors (SDRs) were assumed to form around sea level. Drilling would test this assumption. Ties were also possible to older DSDP sites at more distant offsets from the plume. At some point, SDRs must tie in with the sheeted dike complex, but that was beyond the scope of the NARM program. The age of the negative magnetic anomaly under the east Greenland margin was important; one model implied very rapid crustal accretion. Other areas of interest were variations in volcanic productivity and thicknesses of flows.

The Newfoundland Basin to Iberian Abyssal Plain transect was chosen for non-volcanic margin drilling because of wide zones of thin crust at both margins. In addition, a fundamental problem was the existence of a well-documented breakup unconformity, eroded at sea-level and now 7 km below sea level. Furthermore, the Galicia margin (just north of the Iberian Abyssal Plain) contained mantle exposures on the outer margin. Finally, the margin was sufficiently sediment-starved that deep targets could be reached. NARM-DPG recommended that the first leg of non-volcanic drilling should take place on the Iberian Abyssal Plain. The Newfoundland Basin sites presented a greater technological challenge and data quality there was inferior. NARM-DPG also proposed a single Galicia site, just landward of the peridotite ridge, to determine what overlies the ridge in preparation for future drilling of the S-reflector in that region. This site might form part of the first leg. If time was short, NARM-DPG would prefer to include it and drop one of the other sites, but that would be up to PCOM. The S-reflector was not well-defined where it was shallow. Future drilling of the S-reflector would require 4 km of penetration.

Objectives of the first leg of volcanic rifted margin drilling were to: 1) define age, nature and emplacement environment of initial breakup volcanism, 2) sample breakup volcanism at its supposed maximum and steady-state stage, 3) investigate possible plume interaction with continental lithosphere and plume structure in terms of plume source component, thermal anomaly and possible decoupling with time, 4) help in distinguishing between active versus passive breakup by providing initial crustal accretion rates, and 5) provide subsidence data and important gateway data.

Objectives of the first leg of non-volcanic rifted margin drilling were to: 1) define the nature of the wide, thin-crusted area characterizing this conjugate margin set, 2) test whether mantle exposure along the ocean-continent transition is a laterally extensive feature at thin-crusted margins, 3) provide initial age constraints on margin development, 4) detail knowledge about the succession of rocks landward of the mantle exposure and overlying the S-reflector terrain, 5) determine subsidence histories across the rift zone (syn- and post-rift), 6) define the syn-rift environment, nature and age of breakup and the juvenile ocean to mature ocean paleoenvironment, and 7) determine the nature of the earliest oceanic crust forming along this type of margin.

Larsen concluded his report by thanking Peter Blum, JOIDES Office liaison to NARM-DPG, for his assistance.

Discussion

Natland noted that the NARM-DPG report listed the first volcanic margin leg as requiring 68 days on site. He asked how much could be accomplished toward achieving geochemical goals (i.e., variation with offset from plume) using outcrops in Greenland. Larsen replied that some had been done onshore. Larson asked how confident Larsen was about the estimate that 90% of the volcanics lay offshore. Larsen said that was an approximate figure, but that he was fairly confident about it; it was of the right order.

Von Rad praised NARM-DPG for doing an excellent job in a short time. He noted that BGR had recently surveyed the Iberian Abyssal Plain sites (a lack of site-survey data had been highlighted at the second meeting of NARM-DPG). Mutter commented that the rationale for studying conjugate non-volcanic margins had been to investigate asymmetry, but that cartoons shown by Larsen during his report (and contained in the NARM-DPG report) emphasized symmetry on the Newfoundland and Iberia margins. Larsen replied that more asymmetry existed than the cartoons indicated. Austin thanked NARM-DPG for doing a great deal of work.

OD-WG

Austin explained that LITHP was interested in modifying the mandate of OD-WG. PCOM would return to this issue.

Kidd stated that SSP desired a liaison to OD-WG. Taylor, PCOM's liaison to OD-WG, noted that requested revisions to the MARK and VEMA proposals were in the NAP and felt that there was no need for further comment until PCOM discussed the FY93 schedule the following day.

SL-WG

Watkins stated that SL-WG had met twice, in March and November, 1991. The first meeting involved a review of the problem and development of a provisional outline for a report to PCOM. The second meeting involved further review and discussion, following which participants divided into 4 groups to consider the following topics: 1) synchroneity/timing, 2) geological response to sea-level change, 3) magnitudes and rates, and 4) mechanisms. These *ad hoc* subcommittees drafted reports which included: 1) problem definition, 2) strategies, 3)

special technical issues, and 4) criteria for proposals (guidelines for thematic panels). Subcommittee reports were largely completed at that meeting. The draft final report would be circulated and reviewed prior to the final meeting, which would finalize the report, review the worldwide potential of sites, and address unresolved issues.

Discussion

Shackleton felt that that it was taking a long time to get SL-WG's advice. Watkins replied that the SL-WG chair would be out of the country during the first part of 1992 and that the final meeting could not be sooner. Austin added that oil industry personnel tended to have difficult schedules. Taylor asked whether SL-WG would address pieces of the timescale to be studied and ensure overlap in age between different regions to be drilled. Watkins confirmed that time slices for study had been clearly defined and Austin noted that these were "ice house", "doubt house" and "greenhouse".

931. Status of Engineering and Technical Developments

ODP-TAMU

Storms stated that the ODP-TAMU engineering department was very dedicated. He stressed that the Drilling Operations department was equally dedicated, but did not always get as much exposure as the engineers. He recalled Dick's appreciation, expressed during his report on Leg 140. Storms highlighted the efforts of G. Foss, E. Pollard and R. Grout of Drilling Operations.

Storms showed PCOM's prioritized list of engineering developments (Appendix 13). First on this list was the DCS. DCS tasks that had been completed, and those that remained, are listed in Appendix 13. In response to questions from Larson, Storms said that 4500 m was the total string length limitation for DCS IIB. Concerning the A&G recovery problem, core-catcher options for conventional coring systems had been investigated.

Austin commented that the DCS review meeting outcome was: endorsement of Leg 142, a philosophical commitment to a second deployment of DCS IIB, and endorsement of conceptual development of DCS III (actual construction was still ~2 yrs away). Storms stated that DCS III sea trials might occur ~October, 1994. This was later than previously envisaged and, therefore, further deployments of DCS IIB should be considered. Austin added that TEDCOM had recommended DCS IIB deployment in a different environment from that of EPR (Leg 142). Responding to a question from Duncan, Storms said that it would be difficult to convert from DCS IIB to conventional coring within a single leg. It could be done, but would result in a less-efficient leg. Such flexibility was a goal for DCS III. Natland asked whether 2 new HRBs would be available on Leg 142; Storms confirmed that they would be. He added that all aspects of the HRB had been tested and that it worked well. In addition, the DI-BHA had been fully tested on land.

Storms went on to discuss PCOM's second engineering priority: XCB flow control (XCB-FC). The flow control, "anti-clog" valve had been designed, analytically modelled, fabricated and shore-tested. It was on Leg 141 for sea trials. The goal of XCB-FC was to prevent plugging of the flow ports on the XCB cutting shoes, which had affected recovery in some lithologies.

Noting that Leg 139 had already been discussed, Storms addressed Leg 141 preparations for hard rock orientation, SCM and electronic multishot (Appendix 13). All hardware was aboard. The system was now designed for use with either XCB or RCB coring systems. Storms noted that BP had ordered an SCM like ODP's.

Storms stated that progress on VPC was not as great as he would have wished (Appendix 13). Novatek planned to test their 7" VPC in late November/December, 1991. Results of the test would dictate changes to ODP's 3.5" VPC. Testing was tentatively scheduled for Leg 145. Responding to questioning from McKenzie, Storms said that the last sea trial of VPC had been on Leg 133. The next test would use the same tool. He was not sure how the rust problem, encountered on Leg 133, had occurred. It might have been the result of improper maintenance. ODT-TAMU wants to test VPC further, while meanwhile modifying it. It would be land-tested before the next sea trial.

MDCB had been redesigned and tested onshore (Appendix 13). It was available for testing on Leg 141, but might not be run on Leg 141. Austin noted that PCOM discussed that in August and that MDCB must be tested on Leg 141. It was not up to the co-chiefs. Francis confirmed that it would be tested, but that suitable geology needed to be found first.

Storms explained that B. Carson had assumed the role of Principal Investigator on GEOPROPS and had applied for funding (Appendix 13). When funds were received, ODP-TAMU would initiate changes required. GEOPROPS could be ready for Leg 146 if the money was received. Malfait stated that the money had been allocated. Francis said that the modified GEOPROPS could only go to sea for the first time on Leg 146; it was too late to test it on earlier legs.

Storms moved on to deep drilling. He explained that ODP-TAMU defined deep drilling as any hole requiring >1 leg to drill. This translated to depths of ~1200-1800 m, depending on lithology. ODP-TAMU in-house, deep-drilling draft studies and final reports in progress are listed in Appendix 13, as are the deep-drilling tasks which remain.

Discussion

Austin noted that ODP-TAMU had some new orders with reference to deep drilling as of this PCOM meeting, i.e, to involve the PCOM chair in the process and to proceed with the RFP for a consultant even if there was no OPCOM money (see earlier motion). He stressed the need to get going before TEDCOM's next meeting. Francis encouraged international partners to send in names of potential consultants in addition to TEDCOM's recommendations. Sparks stated that he also intended asking TEDCOM members to bring lists of consultants.

Cowan recalled that TEDCOM had recommended that DCS IIB be tested repeatedly, if possible, on Leg 142. He asked whether there would be a switch to secondary objectives if 100 m penetration was achieved early in the leg. Storms answered that Leg 142 would have the ability to penetrate 300 m. It was proposed to drill to at least 100-150 m. If that was achieved, it would be a shipboard decision as to whether to drill deeper in the same hole, or switch to slimhole logging and reaming tests, or to move the HRB and drill a second 100 m hole. Storms felt that the preference of PCOM and TEDCOM was to continue with DCS drilling and defer secondary objectives. Lyle felt that at least slimhole logging tools should be deployed. On Leg 132, the logging tool could not be lowered beyond the DCS. There was a need to evaluate this

problem. Reaming was also important because of the concerns about DCS logging. Sparks stated that TEDCOM felt that a penetration of 100 m might be achieved, but that recovery rate and bit life would probably be low. TEDCOM recommended repeating the process to improve both. Storms thought it might be best to stay in the same hole. Taylor agreed, since it allowed deeper penetration. However, Becker cautioned that a deep hole might disturb the hydrothermal system, as on Leg 139. That might spoil the area for future work and several shallow sites might be preferable. Austin countered that it would take additional time to set up for a new hole. He added that R. Batiza (Leg 142 co-chief) understood these issues. The minutes could reflect PCOM's wish that coring time should be maximized. Larson asked how far from the main scientific site exploratory holes should be to avoid disturbance to the hydrothermal system. Becker felt that the lava flow at the proposed site might act as a cap rock and that shallow holes would be preferable. Austin responded that, on the other hand, a goal is to reach the deep (AMC) reflector. Rubble was also a problem; it might be better to pursue depth rather than face penetrating rubble again at a second site. Storms said that, if rubble turned out to be a problem, it would be isolated with the DI-BHA. PCOM reached the following consensus.

PCOM Consensus

PCOM supports TEDCOM's recommendation that coring time with DCS IIB be paramount during Leg 142.

Natland expressed confusion about deep-drilling capabilities. He had heard that *JOIDES Resolution* was capable of penetrating 3 km, but he had also heard that Hole 504B was now reaching the limit in basement because of the difficulty of removing cuttings. Storms agreed that cuttings removal could be a real problem, but that ODP-TAMU thought that Hole 504B could be deepened, perhaps by as much as 1000 m, but perhaps by only 100 m. There was already 1000 m of open hole at Hole 504B; the oil industry would view this as increasing the likelihood of problems. Francis added that much mud had been pumped on Leg 140 for cuttings removal. *JOIDES Resolution* had the capacity to use even more mud and he felt that cuttings could be lifted from greater depths. In response to a question from Austin, Grout said that the cost of mud on Leg 140 was ~$15,000.

Moran noted that GEOPROPS required a high-quality hole and asked whether the MDCB test would evaluate hole quality. Storms replied that it would not; the goal would be to keep the motor from stalling and drill a hole.

ICE COVER STUDY FOR NAAG SITES

Francis presented results of an ODP-TAMU study of ice cover to be expected at NAAG sites (Appendix 14). Position of the ice edge was controlled by wind. Ice thicknesses were of the order of 3-5 m. *JOIDES Resolution* required <5% ice cover. In response to a question from Taylor, Francis confirmed that an ice-support vessel would be required for NAAG drilling to scout the ice edge and possibly to push small ice floes. It would not need to tow ice floes, since the ice in the region was not amenable to towing.

Underway geophysics was easier in these latitudes than drilling, since *JOIDES Resolution* must remain on site for several days at a time. The northern sites, subject to wind-driven ice cover, might not remain open for long.

P. Wadhams of Cambridge Polar Consultants (UK) reported on ice conditions at Fram Strait sites (extracts from this report are presented in Appendix 14). The report was based on ice charts from 1966 to 1991. Since 1973, ice charts had been predominantly based on satellite data. The Yermak sites tended to be heavily covered; Fram sites were better, with some longer periods of open water. During the late 1960's, the ice situation was unfavorable. It then improved and had remained more favorable since. Therefore, extrapolation of data from the 1970's, when ice charts were made daily, to the present was acceptable. Shackleton asked whether planning could increase the chances of ice-free water. Francis replied that it was difficult to predict. Histograms showing the likelihood of 4 consecutive ice-free days (Appendix 14) showed that Yerm 1 and 5 were very unfavorable; Yerm 3 and 4 were unfavorable, but chances of success increased in middle August; Fram 1A, 1B, 2, and to a lesser extent Yerm 2, were quite favorable.

Discussion

Duncan noted that if no logging was conducted, time on site could be reduced. Lyle commented that if ice was closing during drilling, there could certainly be no logging. Francis pointed out that the ice front could move quickly (a couple of knots). Larsen asked whether icing of *JOIDES Resolution* might be a problem. Francis replied that ODP-TAMU had not yet looked into that. Larsen felt that ODP-TAMU had been realistic in its evaluations. He added that 1991 had been an excellent year, with very low ice cover. This was encouraging and suggested that it was possible that many sites might be drilled. Moran agreed, noting that she had been on a cruise in that area in August, 1991, when most sites had been clear. She felt that there would be no problem with ship icing at that time of year. However, Francis cautioned against basing plans on a single year's observations.

ODP-LDGO

Lyle reported that the thrust at ODP-LDGO has been toward slimhole and high-temperature tools. He began with a discussion of tools in hand (Appendix 15). The low-temperature version of the BHTV was slimhole, but the entire DCS tubing string would have to be pulled to run it. The high-temperature version was rated to 300°C. The Gable high-temperature temperature tool would transit the DCS, but with little clearance. The Lamont temperature tool was run as a standard tool. The high-temperature logging cable (by PLASTELEC), involving new fibre glass insulation, had yet to be tested; a land test was scheduled for February, 1992.

Lyle moved on to tools on order or in development (Appendix 15). The high-temperature resistivity tool was scheduled to be available in September, 1992. The first version would be analog and rated to 350°C. It would have an upgrade path to a digital tool, if it was successful. It will be slimhole and should fit through the DCS. The wireline packer required a major redesign.

Tools to be ordered or acquired were: high-resolution geochemical tool (possibly to be dewared in the future); slimhole, high-temperature memory tool; slimhole annulus fluid sampler.

Specialty tools (third party) were listed in Appendix 15. The LETI magnetometer/susceptibility tool was for use in core-log integration. It was currently a low-resolution tool (~1.5 m), but LETI was planning to develop a high-resolution (2.5 cm) magnetometer/susceptibility tool. The Japanese magnetometer would be tested on legs 143 and 144.

If personnel were available, core/log integration was trivial, but time consuming, when recovery was >90%. It became extremely difficult when recovery was <10%. The problems were: 1) correlations are based on physical properties, but disturbance correlated with poor recovery, and 2) non-random sampling in poor-recovery holes. Of correlation tools, only bulk density, and possibly FMS, were presently available.

Correlation Tools	Resolution	
	Core	Log
Bulk Density	2-4 cm	50-70 cm
Magnetic Susceptibility	~10 cm	150 cm
		(45 cm, 1993; 2.5 cm, 1994?)
Natural Gamma	10 cm (?)	50-100 cm
Resistivity	~0.5 cm (?)	0.25 cm

Annual Meeting JOIDES PCOM
Friday, December 6 1991

932. Short Term Planning (FY92 / Pacific)

SUPPLEMENTAL SCIENCE

Austin explained that the concept of supplemental science was developed and instituted at the 1990 Annual Meeting of PCOM with Panel Chairs. Advertisements for submission of supplemental science proposals were placed in early 1991. At its August, 1991, meeting, PCOM decided to consider 2 supplemental science proposals, but to ask thematic panels to provide guidance on what scheduled science should be dropped in the event of these supplemental science proposals being scheduled.

S-2: Logging Hole 801C

Austin ruled that Larson, a proponent of S-2, could remain in the room during discussion, in line with PANCHM recommendations, but could not lobby for his proposal. Austin would decide what constituted lobbying. Thematic panel recommendations were summarized in the Agenda Book (blue pages 17-20). At its August, 1991 meeting, PCOM decided to make S-2 an alternate during A&G drilling (Agenda Book, blue page 17). There had since been a number of changes to legs 143 and 144. Austin called on Meyer to describe these.

Meyer explained that, following A&G-DPG, Leg 144 comprised 8 sites with 36.7 days drilling time, 8.4 days logging and 11.9 days transit, for a total of 57 days. At the end of October, these time estimates were revised and were now much longer. Leg 144, as originally planned, would last 78.8 days, or 82.3 if S-2 was incorporated. The co-chiefs had, therefore, prepared a draft prospectus, pending PCOM discussion, in which sites Harrie-2, Syl-2 and Seiko-2 had been dropped. In addition, penetration at MIT had been reduced. The co-chiefs had added a site, Syl-4, on the reef crest (only 200 m penetration, rather than the usual 400 m). This would require PCOM discussion. The leg length, with these changes, was now 56.7 days. The co-chiefs were concerned about the deleted holes, but their philosophy was to ensure some drilling

on every guyot, with 2 sites on each if possible, rather than to drop a guyot to permit larger numbers of sites on each of the remaining guyots.

The reasons for underestimated drilling times were the need for extra HRBs and re-evaluation of uncertain basement depths, which meant that required penetrations had increased. Logging of Hole 801C, if scheduled, would take place after leaving Wodejebato (Sylvania) and before MIT-1. It would require 3.5 days on site, a great deal of pipe trip time being necessary because of the 5000 m water depth. Logging would involve standard Schlumberger logs of the basement section, plus BHTV, drill stem packer, and Japanese magnetometer. The HRB would be moved from Syl-4 to MIT. Storms added that that HRB would not be ballasted and, if necessary, could be taken apart on the transit.

Meyer drew PCOM's attention to an additional, arithmetic error in drilling time estimates discovered only the previous day. Harrie-1 would require only 4.8 days of drilling instead of 7.9, i.e., 3 days less. She apologized for the error.

Discussion

In response to a question from Taylor, Austin stated that, if S-2 is scheduled, Seiko would drop out, and that is the high latitude site. Tucholke felt that, by dropping 3 sites, sea-level objectives were being compromised, especially in view of poor recovery to be expected in shallow-water carbonates. Austin noted that paired sites (back-reef and flank) had almost completely disappeared, though Syl-4 helped a little. He characterized Leg 144 as a "bare-bones leg". Responding to a question from Tucholke, Meyer said that, of the dropped sites, Harrie-2 and Syl-2A were both back-reef; Seiko-2 involved a HRB on the reef crest (note: this conflicts with the A&G-DPG report, *JOIDES Journal*, June, 1991).

Becker, while acknowledging that he had missed the previous 2 PCOMs, recalled that, at the 1991 Annual Meeting, some on PCOM had wanted only one leg of A&G drilling based on a statement that top priorities could be achieved by a single leg. Austin responded that PCOM had decided to incorporate top-priority components of 2 proposals into 2 legs. Taira asked what the present level of confidence about basement picks was. Meyer replied that PPSP had the same doubts as SSP about basement picks. Limestones might have higher velocities and, therefore, basement might be deeper. Austin added that there was very limited velocity control; limestone velocities varied due to porosity. Meyer noted that, in addition, flat-lying reflectors underlay the basement picks. Kidd commented that SSP had become uneasy about basement picks when it saw the excellent Enewetak data, where reflectors appeared similar to those on A&G guyots, but where basement was drilled at 900 m. Natland felt that there were different ways of judging basement.

Cowan asked whether petrologists present could comment on the scientific urgency of logging Hole 801C. Duncan replied that Hole 801C was a unique case and comprised an end-member of oceanic crust. However, penetration was shallow. Lancelot commented that he had been impressed by what he had heard the previous day about the potential for physical properties and magnetic properties work, more so than by the potential returns of geochemical studies. Site 534 was also available as a slow-spreading end member. Lancelot would prefer to deepen Hole 801C before logging. He felt that, since PCOM did not have the data before it to enable it to question the A&G basement picks that had been made, PCOM should simply decide on Hole 801C, i.e., was logging 801C important enough to justify dropping one of the A&G sites? Natland also preferred to log a deepened hole. He was also concerned about overprinting by alkali basalts from nearby seamounts. Nevertheless, there were no logs in old ocean crust. The

advance provided by logging Hole 801C was incremental. In response to a question from Austin, Humphris said that there was a proposal to deepen Hole 801C, which had received some LITHP interest, but not the highest. LITHP was most interested in physical properties (permeability, porosity and stress). The geochemical tool should be given the lowest priority, since expected variation was probably not within the resolution of the tool. McKenzie stated that SGPP had supported LITHP's position. Responding to Lancelot, Humphris confirmed that LITHP had examined the coring record from Hole 801C and was particularly interested in stress measurements. Malpas agreed that physical properties of old crust were the most important objectives. He preferred to see reconsideration of deepening Hole 801C. However, he added that he was interested in the extra 3 days found by Meyer. Austin cautioned against micromanaging an arithmetic error, which might just as easily be reversed later. Malpas countered that the co-chiefs were not averse to logging Hole 801C, if time was available. Cowan stated that the co-chiefs would have to consider the advisability of continuing to try to reach basement on a guyot versus logging Hole 801C. He suggested leaving S-2 as an alternate. Taylor added that the co-chiefs would probably also prefer use the extra 3 days to replace one of the sites that has been dropped.

Shackleton explained that OHP ranked A&G highly because of pelagic cap sites. PCOM should not allow those to be dropped. He was aware of a scientist who was participating in Leg 144 purely to work on such sites. Austin agreed. Lyle pointed out that many DPGs are operating without checking their time estimates with ODP-LDGO and ODP-TAMU. Austin commented that R. Jarrard had wanted a liaison to A&G-DPG. It was incumbent on ODP-LDGO and ODP-TAMU to contact DPGs about representation.

Von Rad observed that PCOM had received advice from thematic panels supporting S-2. Cita-Sironi recalled that she had been in a minority at the August PCOM meeting in supporting S-2. Now that the thematic panels had supported it, it should go ahead. However, Jenkyns felt that Leg 144 had taken a battering and that S-2 should remain an alternate. Taira supported logging 801C. Watkins was concerned about the loss of sea-level elements. He felt that the A&G program was changing character, with basement penetration dominating, and that a back-reef site should be reinserted.

Austin conducted a straw vote, which revealed that a majority of PCOM favored logging Hole 801C as an alternate. He asked whether, if it remained an alternate, PCOM should give further instruction to the co-chiefs. Mutter felt that PCOM must indeed instruct the co-chiefs on how to use the alternate. Austin agreed. Tucholke expressed concern about what was happening to the A&G program. Reef recovery would be poor and any changes that diluted the stratigraphic record must be avoided. He did not agree with the co-chiefs' choice of sites to be dropped. Austin pointed out that the prospectus was only a draft and that the co-chiefs were awaiting instruction from PCOM. Taylor shared Tucholke's concern. The co-chiefs had exchanged Syl-2A and Harrie-2 for Syl-4. Wodejebato (Sylvania) originally had 2 pelagic cap sites (Agenda Book, white page 594). It had retained 1 plus a reef site and was, therefore, fairly complete. However, Harrie-2 had been sacrificed. The extra 3 days that Meyer had found would enable Harrie-2 to be reinstated. Then, only Seiko-2 would be lost. Austin stated that MIT and at least 1 site on Seiko (Seiko-1) must be retained and paired sites included on Wodejebato (Sylvania) and Limalok (Harrie). Therefore, he agreed that Harrie-2 should be reinstated and that logging Hole 801C must remain an alternate.

Austin noted that PCOM must also consider Syl-4. Since it was a new site, PCOM must endorse it. Jenkyns expressed concern that aiming for the reef at Syl-4 would yield the lowest recovery. Lancelot suggested evaluating the relative merits of logging some A&G sites versus logging Hole 801C. He proposed dropping some A&G logging (one of the basement sites) to

permit logging of Hole 801C. Austin asked Humphris for her opinion and she said that logging Hole 801C would probably be more useful than logging guyot basement. Natland agreed, adding that the magnetic signature at MIT would be established from samples and the Japanese magnetometer. However, Lyle cautioned that this would not free up enough time for logging Hole 801C, because logging at each site only took a day. Austin felt that PCOM would be "compounding a felony" if it told co-chiefs not to log some A&G sites.

A motion was written and read to PCOM (see below for final version). Responding to a question from Lancelot, Austin pointed out that, since it made no mention of logging, logging of Leg 144 sites would proceed and not be dropped in favor of S-2. Taylor suggested including approval of Syl-4 and reinstatement of Harrie-2. Austin noted that recovery at reef site Syl-4 would be poor and recalled that the original intention of A&G-DPG was to focus on back-reef sites. McKenzie reminded PCOM that, at several sites on Leg 133 in shallow-water limestone, core after core had no recovery. Meyer said that the co-chiefs would have had the experience of Leg 143 before they got to Syl-4. If the prospects appeared very poor, they would not attempt Syl-4. Tucholke proposed retaining Syl-2A and making Syl-4 an alternate to that site. Austin explained that the rationale for Syl-4 had involved sea level objectives, but that he did not understand that choice. Tucholke agreed that paired lagoonal sites were required for a sea-level record. Lancelot recalled that S. Schlanger, a proponent of A&G drilling, had originally wanted to drill the reef, but later decided that the pelagic cap offered the best chance of success. He would have been reluctant to drop the pelagic sites, unless it could be proved that core recovery in the reef would be good. Meyer noted that, since the prospectus was only a draft, Harrie-2 was never fully discarded and did not, therefore, technically need to be reinstated. Taylor observed that the motion did not prevent logging of Hole 801C. Mutter agreed, adding that the motion simply spelled out what cannot be dropped in order to log Hole 801C. Francis asked about the priority of Syl-4 versus logging Hole 801C; Lancelot felt that a list of priorities to be accomplished before getting to MIT was needed. Malpas stated that the motion covered that. Austin agreed, and added that, since Syl-4 is an alternate, there would be no need to drill it if Syl-2A was drilled. Von Rad pointed out that there was no requirement to log the 3 sites with penetrations <400 m, but Austin and Meyer stressed that logging would be essential, since recovery would be low. In response to a question from Becker, Malpas confirmed that the motion stated that Syl-4 would only be drilled if Syl-2A was not drilled. Austin pointed out that Syl-4 would take longer than Syl-2A, so that it was not a simple trade-off in time. However, he felt that the sentiment on PCOM was that the pelagic cap was more important than the reef as a drilling target. Cita-Sironi felt that PCOM was over-planning, but Austin felt that was not the case in light of previous under-planning. The co-chiefs had wanted input form PCOM. PCOM finally passed the following motion.

PCOM Motion

With respect to the program for drilling Atolls and Guyots II, Leg 144:
Logging at Hole 801C will remain as an alternate activity if time is available after the following conditions are met (or attempted) as part of the prospectus program (in order of precedence):

1) that MIT-1 is maintained as a basement penetration site;

2) that Seiko-1, basement site, be retained to provide required latitudinal spread in basement sites;

3) that Harrie-2 be included to provide paired sites on Limalok (Harrie) to accomplish sea level/paleoceanographic (dipstick) objectives.

4) that site Syl-4 be an alternate to Syl-2A to maintain paired pelagic cap site philosophy and to optimize recovery for those objectives.

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

S-3: OSN-2 Cased Re-entry Hole

Austin recalled that OSN-2 would be the second of a proposed series of OSN holes. S-3 was originally submitted as a 4-day effort. It was subsequently feared that it would require as much as 10 days, but the latest ODP-TAMU estimate was 5.7 days, including a contingency allowance of 1 pipe trip. Thematic panels were fairly negative about the scheduling of S-3 (Agenda Book, blue pages 17-20). Austin also recommended against scheduling S-3.

Mutter pointed out that thematic panel advice was based on a time estimate of 10 days. He asked whether reduction to 5.7 days made a difference to the panels. Moores replied that TECP supported S-3 and listed the science it would be prepared to drop. The reduced time estimate increased TECP's support. Humphris stated that LITHP also supported S-3 and was prepared to give up basement penetration, but that would only yield 4 days. Lancelot recalled that much of PCOM's support was based on the idea of involving a new community in ODP. He suggested that JOIDES might even need a geophysics panel some day. In August, Lancelot had suggested spreading the load among legs, but Francis said that was impossible. In response to a question from Lancelot, Francis said that it remained impossible, since Leg 145 was already 59 days in length. Shackleton stated that the time released by OHP, based on its discussions of how to cut science to accommodate S-3, was <10 days. Austin commented that OHP was closest to this issue and its advice on cuts was perhaps the most relevant.

Taylor felt that even 6 days was too much; he did not think that OSN-2 warranted it. Austin stated that FDSN had a number of objectives over the next several years, involving OSN-1 and developing a global plan. They were faced with many unknowns before they could make optimal use of holes. Taylor added that some individuals he had spoken to were not even sure that holes were needed for seismometers. It might be sufficient to bury them in sediment. One group even questioned the necessity of placing a seismometer in OSN-1. However, Natland responded that that objection referred only to OSN-1 and not to OSN holes in general. Austin stressed that ODP has created goodwill among the OSN community. Scheduling of OSN-1 had been primarily renewal-based. A proposal to fund a seismometer for OSN-1 was under consideration by NSF. PCOM could help FDSN by expressing interest, but requesting a global plan. Taira agreed that a global plan was necessary. He felt that scheduling S-3 would involve an unacceptably great loss of time from Leg 145. Mutter noted that OSN-2 would be important for Japanese earthquake monitoring and highlighted the need for some Japanese effort. Taira responded that there was interest in Japan, but that there were also other plans. OSN-2 was not the only choice and it was important to coordinate global thinking. Lancelot noted that 3 broad-band seismometers were under development by French, Japanese and US groups. The French seismometer would be tested using NADIA in the Atlantic, but there was also interest in testing it in OSN-1.

Natland observed that the original plan for supplemental science involved up to 4 days/leg. PCOM, therefore, took on the consequences of impacting legs by up to 10% of their drilling time. Of the supplemental science proposals, PCOM ranked OSN-2 most highly because of its long-term, potentially major, impact and involvement of a new community. He felt that supplemental science proposals that occupy <4 days would be rare.

A motion on OSN-2 was read. Malpas asked whether PCOM could request future proposals, rather than simply "look forward" to receiving a global plan, but Lancelot recalled that Taylor had characterized the OSN community as lukewarm about OSN-2. However, Taylor stressed

that only *part* of the OSN community was specifically against OSN-2, but that they were in favor of the general concept. PCOM passed the following motion.

PCOM Motion

Because of its impact on Leg 145 drilling, PCOM declines the request to include OSN-2 in the FY92 program plan. PCOM continues, however, to endorse the concept of dedicated holes for ocean floor seismic observatories and looks forward to receiving from FDSN a global plan for prioritized testing and implementation.

Motion Duncan, second Lancelot Vote: for 14; against 2; abstain 0; absent 1

PACE OF GEOPROPS TESTING

Austin referred to the motion passed by PCOM at its August meeting (Agenda Book, blue page 22). Since then (correspondence in Agenda Book, white pages 606-614), B. Carson had assumed the third-party role. NSF provided funds on November 1, 1991. The original plan had been to test GEOPROPS on Leg 143, but this was now felt to be too optimistic. GEOPROPS would have to be tested on Leg 146 (CA). Francis interjected that it was a question of lack of time on legs 143 and 144 for testing. Taylor noted that PCOM could make time. Austin stated that GEOPROPS required MDCB, which was to be tested on Leg 141. Several deployments of MDCB would be requested prior to a GEOPROPS test. It was felt that that would take more time than could be afforded on A&G legs. In addition, there was a shortage of personnel. S. McGrath, a new ODP-TAMU engineer with responsibility for GEOPROPS, was at sea on Leg 141 so that there would be no progress on GEOPROPS until his return. In August, PCOM did not commit to a test of GEOPROPS before Leg 146. Carson was disappointed, but the test schedule may now be locked in.

Taylor described the reaction of the accretionary prism community. They had wanted to test GEOPROPS before Leg 146 because it is important that it work on Leg 146. Carson and that community did all they could as quickly as possible to bring the schedule forward. They were, therefore, dismayed that their intense effort has not been rewarded by a positive result. Austin agreed, but added that rapid planning had been needed even for a test on Leg 146. The problem was lack of personnel. Taylor felt that should be communicated to Carson. Austin stated that he had received a letter from Carson saying that CA objectives could be accomplished without GEOPROPS. He did not feel that there was as much bad feeling in the accretionary prism community as Taylor had suggested. Moores agreed, noting that C. Moore had informed him that there were other methods. Austin expressed the view that perhaps tools should be tested on legs whose co-chiefs had a strong interest in those tools. For that reason, he was not sure that a viable test could be achieved on Leg 143 even if GEOPROPS were aboard on that leg. However, he was concerned that ODP-TAMU had offered a test on Leg 143, which now seemed out of the question. Francis stated that a test of GEOPROPS could have been carried out on Leg 143 if PCOM had insisted, but that time available on that leg was severely restricted. Meyer said that one reason that GEOPROPS testing could not take place on Leg 143 was that there might be no time for APC coring of pelagic caps, so that a special hole would have to be started to test GEOPROPS. Austin stated that no motion was required in this case. GEOPROPS would be aboard on Leg 146 and the minutes would reflect PCOM's intention that it be tested on that leg. Storms explained that McGrath was being trained on MDCB on Leg 141, but he was not working on MDCB. ODP-TAMU had had to move ahead on decisions before knowing the outcome of Carson's efforts. Austin added that, when a tool is changed from third-party to internal-ODP, PCOM must be prepared for problems relating to personnel

shortages. Storms recalled that, furthermore, PCOM had made MDCB and GEOPROPS the lowest priorities on their engineering prioritization list. However, Austin stressed that at that time (PCOM's April, 1991, meeting) the assumption had still been that some of the load would be carried by a third party.

LEG 147

Austin stated that Leg 147, originally scheduled as either engineering/EPR or HD, would now be HD, since Leg 140 had been Hole 504B. However, there was some enthusiasm for a quick return to Hole 504B and a proposal to do that had been submitted. Leg 147 was technically in FY93, so PCOM could ask EXCOM to change it to 504B. HD could then be deferred until after FY93 Atlantic drilling. Malpas suggested deferring the transit to the Atlantic so that both 504B and HD might be accomplished. Austin responded that EXCOM might have more difficulty with that. Lancelot felt that the new 504B proposal should go through the system and be ranked.

Austin called on Mutter to describe some late geophysical results regarding 504B. Mutter began by noting that he was not a proponent. In 1985, MCS and sonobuoy data were collected around Hole 504B. All data had now been re-analyzed with new processing to improve the image of structures. All indications suggested that the bottom of Hole 504B was now very close to Layer 3, or at least to a layer with Layer 3 seismic velocity. Velocity was well constrained, though some error in depth to the layer was possible. Watkins asked whether the sonobuoy surveys had been reversed. Mutter replied that they had not, but that it was felt that there were no structural problems and the sonobuoy surveys were shot in several different directions. Seismic data indicated that Hole 504B was within a leg of Layer 3, barring a catastrophe.

Moores felt that, notwithstanding the OD-WG strategy of drilling the layer 2/3 and 3/4 boundaries and a mantle section, there was always uncertainty with the offset approach. He felt that Hole 504B provided a good opportunity. Malpas agreed, adding that Hole 504B might have reached the top of Layer 3 already. Penetration of more dikes might indicate that the ophiolite model is wrong. Furthermore, the layer 2/3 boundary is not smooth; in some places dikes extended deeper, in others gabbro was shallow. The boundary should be tested. Becker stated that the proponents' intent was not to replace HD, but to go through normal procedures. (Austin pointed out that Becker and Dick were proponents of the return to 504B). Humphris explained that LITHP ranked HD second, below EPR II (engineering). Since the latter was undrillable, HD was now effectively at the top of LITHP's list. LITHP would be interested in the 504B proposal, but she felt that HD should not be replaced now, adding that 504B was close to the Panama Canal. However, referring to PCOM's 4-year plan, Austin pointed out that if Leg 147 was not 504B, it would not happen until at least spring, 1994. Malpas stressed that 504B provided an opportunity; EXCOM wanted deep drilling. Furthermore, the TAG hydrothermal (Atlantic) program might benefit from being delayed. Larson said that he resented EXCOM setting science, but Austin responded that they would not. Austin felt that it would be dangerous to schedule a leg before the relevant proposal had passed through the system. However, TAG did face some difficulties and 504B could substitute for TAG. Malpas agreed that the proposal had not been reviewed, but pointed out that 504B was not a new site. This was a chance to be opportunistic. Austin agreed and stated that PCOM should take action if it felt strongly. In response to a question from Natland, Austin said that the 4-year plan specified that *JOIDES Resolution* would transit to the North Atlantic, following Leg 147, and remain there until April, 1994. April, 1994 to April 1995 involved drilling in the Atlantic and adjacent seas (including the eastern Pacific). Malpas stated that he did not mind going back on motions

so long as it did not involve substitution. In this case, an extra leg might be inserted, avoiding the need for substitution.

Von Rad suggested that, since SSP had concerns about HD site survey data, 504B could be a back-up leg for HD. Kidd stated that SSP's concerns were not with a first approach to HD. However, he added, SSP also felt that TAG could not be the first leg of the Atlantic program. Von Rad stated that he would have no objection to a 1-leg delay of the entry of *JOIDES Resolution* into the Atlantic. Cita-Sironi was, in contrast, strongly opposed to such a delay, noting that ESF had already waited for 5 years for Atlantic drilling. Austin countered that, on the other hand, PCOM had a responsibility to schedule the best science. Cita-Sironi preferred that 504B be substituted for HD, rather than scheduled in addition to HD. Taira had no objections to drilling 504B, but asked to hear LITHP's choice between 504B and HD. Humphris responded that time would first be needed to interpret results of Leg 140. Jenkyns was concerned that PCOM was responding to post-leg euphoria. The UK was anxious to see *JOIDES Resolution* in the North Atlantic. He added that he would like to hear debate on the choice between 504B and HD. Lancelot stated that France was not worried about a delay in the approach to the Atlantic, but that he was not totally convinced that Hole 504B was almost at the layer 2/3 boundary. He asked what PCOM would do if, following A&G drilling, it was felt that the sea level problem was almost solved and an immediate return was proposed. To change the schedule now might be to open a "can of worms". Malpas said such an eventuality could be discussed if and when it arose. He suggested that TAG should be delayed, and that Cita-Sironi should consider whether ESF would prefer 504B or TAG. PCOM must consider HD, 504B and TAG. Austin agreed that TAG might not be drillable in FY93, though it might be better to defer further discussion of TAG until PCOM discussed the FY93 schedule. He said that he was prepared to approach EXCOM with 504B as an addition to the schedule, but that he preferred not to substitute 504B for HD, because that would defer HD until 1994 and the offset drilling program would be set back. Von Rad stressed that a success at Hole 504B would help all of the international partners in their renewal efforts. Taylor proposed deferring further discussion until FY93 scheduling. Austin agreed.

HOLE 857D (LEG 139) THERMISTOR STRING

Becker described his proposal to use 1.5 days on Leg 146 (CA) to replace the thermistor string left in CORK Hole 857D on Leg 139. Hole 857D had been drilled deeper than planned and the existing thermistor string only extended ~half-way down the hole. That configuration would reveal little about basement hydrology and a proposal had been submitted to NSF to pay for a new thermistor string. The Leg 146 co-chiefs were willing to incorporate thermistor string replacement within Leg 146. Leg 146 would install 2 CORKs, so that the personnel would be on board. CORK emplacement on Leg 139 had gone very well and the estimate of 1.5 days to complete the replacement seemed to be a good one. It would be necessary to run a sinker bar into Hole 857D to test for obstructions.

In response to a question from Taira, Becker said that the existing thermistor string was recording temperatures >200°C at present. Lancelot stated that he would support the plan, if the proposal had no impact on Leg 146 and the co-chiefs were happy. He asked for information on the impact on Leg 146 operations. Von Rad reported that SGPP had discussed the proposal and was in favor of it. McKenzie confirmed SGPP's support of taking time from Leg 146 to replace the thermistor string. Becker said that Hole 857D lay between the Vancouver and Oregon sites of Leg 146. PCOM passed the following motion.

PCOM Motion

PCOM endorses the plan to dedicate no more than 1.5 days during Leg 146 to replace the sensor string in Hole 857D. PCOM requests the co-chiefs of Leg 146 to provide information on the impact of this on the scientific plan for Leg 146, for PCOM to evaluate at its April, 1992 meeting.

Motion: Natland, second Lancelot Vote: for 15; against 0; abstain 1; absent 1

933. Detailed Planning Information for North Atlantic Drilling

Austin stated that PCOM must consider scheduling ~5 legs for the period January, 1993, to ~October, 1993. Some flexibility was provided by PCOM's decision to schedule part of FY93 at its 1990 Annual Meeting, but Austin recommended against going too far into FY94. One of the FY93 legs might be an engineering leg for a second deployment of DCS IIB. Also up for discussion was the possibility of including 504B before beginning the Atlantic program. Austin called on PCOM watchdogs to give summaries of programs in the NAP. He asked watchdogs to stress thematic impact of proposed drilling and its reliance on technology.

ALBORAN BASIN / GATEWAY AND MEDITERRANEAN RIDGE (AB)

Cowan noted that this program comprised 3 proposals. He reviewed them separately.

Alboran Basin

Cowan noted that Kidd was a proponent. Objective of Alboran Basin drilling was to determine origin and history of extensional basins in a collisional setting. Drilling would establish: 1) timing of extension, 2) subsidence history, and 3) geodynamic mechanism, though with probably less success than 1) and 2). The proposal involved ~1 leg of drilling. Site-survey data were in hand or in progress and no operational and technological difficulties were envisaged.

Proponents needed to justify that the Alboran Basin was the best place in the world to study this problem. In addition, there were preexisting deep holes on the shelf that could provide subsidence information. Finally, there was another proposal (proposal 399) to do similar work. Proponents of both should combine their efforts.

Mediterranean Gateway

This proposal would study late Neogene to Quaternary paleocean history. Drilling would determine history of water exchange and pre- and post-Messinian environments and occupy ~1 leg. Site-survey data were not yet in the Data Bank, but were probably adequate. No operational and technological difficulties were envisaged.

Presence of sandy contourites might mean that this was not the best location for this work. The proposal could be developed further, rather than included as an add-on to the Alboran Basin proposal. McKenzie added that SGPP had encouraged proponents to develop the contourite theme and that the proposal was added on to the Alboran Basin program because SGPP had suggested that.

Mediterranean Ridge

Cowan noted that Cita-Sironi was a proponent. This was a proposal to study accretionary wedge tectonics in a collisional setting and also pre- and post-Messinian paleoceanography. Drilling would comprise conventional transects to investigate fluids, stress and structural questions. Mud diapirism was also an objective, and there was an opportunity to drill the sub-Messinian section. The work would require ~1 leg. More survey data were needed, including MCS and perhaps side-scan. There were plans to collect the former, but not the latter. SCS and piston cores were collected in 1991. The usual convergent margin technological concerns existed; salt was also likely.

The collision rationale appeared weak. Stronger elements were mud diapirism and the role of evaporites in accretionary prisms with regard to fluid pressure and stress.

Discussion

Taylor stressed that the presence of evaporites mandated good MCS data before a hole was drilled through the evaporite seal. Austin responded that Kidd would assess drillability from SSP's perspective later. Cita-Sironi stated that 1 MCS cruise had been cancelled, but another was scheduled for January-February, 1992, of which Cita-Sironi was a proponent. Another funded MCS proposal was scheduled for October, 1992. Kidd reported that SSP saw no problems with shallow penetration at Mediterranean Ridge, only with penetration below the Messinian. The data for Alboran Basin and Mediterranean Gateways appeared adequate. Shackleton felt that it was unsatisfactory to have these 3 proposals in a single package, because their objectives were different. Natland asked what PCOM should be considering for scheduling. Moores agreed with Shackleton, as did Lancelot, who suggested a DPG. Austin responded that proponents had been asked to work together and PCOM should endorse their efforts to do so. The program probably could not yet be packaged as a single leg.

CEARA RISE (CR)

Watkins stated that this proposal had been requested by OHP as the last of a series of legs to reconstruct Cenozoic deep water circulation, chemistry and climate. Specific objectives were: carbonate production/dissolution (calcium carbonate production, deep circulation and climate linkages), surface water and tropical climate, and variations in surface water carbon isotopic values. Site-survey data were inadequate for Paleogene objectives, but a *R/V Ewing* cruise had been scheduled for August, 1992, involving Hydrosweep, 3.5 kHz, MCS, sonobuoy refraction and long piston cores. Kidd added that SSP agreed that the present site-survey package was inadequate, but would become acceptable if the planned cruise sailed as scheduled.

Discussion

Von Rad suggested combining the Amazon Fan (AF) and CR programs. Shackleton, noting that he was a CR proponent, commented that OHP did not think that the AF can address the same objectives as CR, contrary to claims of AF proponents. Natland stated that again there was no 1-leg package before PCOM for scheduling purposes.

EQUATORIAL ATLANTIC TRANSFORM (EAT)

Mutter stated that EAT focussed on the Ivory Coast - Ghana transform and was one of only 5 programs under consideration that were ranked in the top 5 by >1 thematic panel. EAT comprised a very basic investigation of a major transform margin and was philosophically similar to NARM-DPG proposals. EAT would test no real model and the work was limited to kinematic description. A great deal of data were available, mostly French and UK. Drilling would yield information on lithology, timing of sedimentary events, and vertical motion histories (using subsidence curves and thermal models). A relatively simple, 2-transect approach was proposed across the boundary between continental and oceanic lithosphere. Pre-transform, syn-transform and post-transform (Romanche Fracture Zone) sites were proposed.

Discussion

Austin observed that, once again, this program was not in the form of a single leg. Mutter added that it exceeded 6000 m of drilling in total. However, proponents could make a leg out of it and had been asked to do so. Larson felt that EAT was reminiscent of the Broken Ridge leg, with the goal of dating unconformities. Mutter agreed that there were similarities. Austin recalled that the Atlantic Panel had always acknowledged EAT as an excellent place to study transform margins. Kidd stated that the data are not yet in the Data Bank, but he knew that data existed and were of high quality. Processing was well underway. Austin asked whether SSP would like to have an alternate for EAT if it was scheduled, in order to encourage data submission. Kidd replied that that would not be necessary, but an alternate would be desirable for CR. Watkins noted that EAT was in an area of hydrocarbon exploration and was concerned that the seismic grid might not be sufficiently detailed for safety evaluation. However, Mutter responded that all sites were on, or near, crossing lines. Lancelot suggested that PPSP preview the data so that they could direct proponents to process lines in the best order. Austin said that there seemed to be less concern about packaging 1 leg of drilling at EAT. Mutter added that EAT provided good examples of some common features observed on transform margins. Shackleton commented that support from OHP depended on Mesozoic objectives. If those were pruned, OHP would feel differently. Mutter doubted that would happen.

MAR OFFSET DRILLING (MAR)

Taylor reported that the goals of offset drilling were to core the layer 2/3 boundary, recover long gabbro cores, core the layer 3/4 (Moho) boundary, and recover long ultramafic cores. Proposals existed in 2 areas: MARK and Vema. Each would fill ~1 leg.

The MARK area had an extensive database and had already been drilled. Proposed sites were: MARK-1, just south of the transform ridge in gabbro, and MARK-2 in serpentinized ultramafics. Dick (a proponent) informed PCOM that there were two possible origins of the serpentinized ultramafics: 1) a detachment fault surface exposing mantle due to what he called nested half-grabens, or 2) a migration of a serpentine diapir originating in the mantle, (where water had flowed down a fault and hydrated the mantle, creating a low-density serpentinite). Taylor characterized the program as reconnaissance exploration, since processes in axial valleys were poorly understood.

At the Vema Fracture Zone, Vema-1 was located on the south wall of the transform near the layer 2/3 boundary and Vema-2 was located on a limestone cap on the transform ridge to record evolution of the transform ridge, which was thought to have been uplifted and then subsided.

Discussion

Kidd stated that site-survey data suffered from the same problems as those of HD, principally a lack of seismic data, though there were some MCS data at MARK. It would depend how far PCOM wished to go with the test-drilling approach. SSP felt that data from the MARK area could be adequate. The Vema area was awaiting a side-scan cruise in 1993. Humphris reported that LITHP believed that the MARK data were sufficient to allow immediate drilling, but that interpretations of existing data were insufficient to enable testing of hypotheses. LITHP had more concerns about Vema. Moores stated that TECP would rank MAR highly if the data were together. Austin, noting that LITHP would like to see OD-WG become a DPG, expressed concern that the strategy for offset drilling was not yet ready and that a DPG was premature. Humphris responded that, when ranking MAR, LITHP had wished to avoid second-guessing OD-WG. LITHP felt that MARK was ready for drilling, but that Vema was not. LITHP felt that the JOI/USSAC Workshop Report, *Drilling the Oceanic Lower Crust and Mantle* (1989, WHOI, Organizing Committee H. Dick, H. Hoskins, J. Johnson), had provided the general strategy and that an Atlantic offset-drilling strategy with specific sites was needed. Moores added that TECP had supported LITHP. A revised MARK proposal might be submitted that would provide models for testing.

Taylor explained that MARK and Vema were among the top 5 locations, globally, considered by OD-WG. The petrological community did not have samples of gabbro and ultramafics from these environments and, therefore, did not know what to expect. Austin added that the OD-WG plan was to fill in a matrix of crustal depths versus spreading rate (fast and slow). Moores stressed that the ophiolite analogy remained uncertain. Dick felt that the origin of the serpentinite exposures should be understood in order to plan a strategy. Mutter reminded PCOM that the volcanic rifted margin proposals did not define a strategy; that came from NARM-DPG. Taylor emphasized that deep drilling, or offset drilling, occupied about one third of LITHP's 10-year plan and they wanted to get started. Moores felt that, in the case of offset drilling, the difference between a WG and DPG was not great. Austin asked which program LITHP felt was most ready: MAR or TAG. Humphris noted that she was a proponent of TAG and replied that both could be drilled. A site-survey proposal for TAG had been submitted and it would be best to complete survey work before TAG was drilled. She added that, with data in hand, testing of models at MARK was difficult.

MEDITERRANEAN SAPROPELS (MS)

Cita-Sironi characterized MS as a conceptual proposal. It had been highly ranked by SGPP. Sapropels (pelagic sediment containing ≥2% organic carbon by weight) occurred all over the eastern Mediterranean and were generally 1-2 m thick. They had been primarily studied in the youngest part of the stratigraphic column. At present, water entered the Mediterranean from the Atlantic at the surface and flowed out to the Atlantic at depth. The classical model for sapropel origin involved discharge of meltwater from the Black Sea, which formed an upper layer of low-density water, beneath which anoxic conditions developed. More recently, a model involving upwelling in the eastern Mediterranean, reversal of currents and nutrient import from the Atlantic had been proposed. MS would involve only APC drilling.

The proposal lacked a geological perspective in time and space. In time: the entire, 100-600 m, Plio-Pleistocene succession should be drilled. In space, a full transect of the Mediterranean, from east to west and including the Black Sea, was required: there were 3 sills in the Mediterranean (Gibraltar, Sicily and the Bosporus) and a strong west-to-east salinity gradient

(Appendix 16). The eastern Mediterranean was highly saline and its bottom temperature was much higher than that of the Atlantic. If current reversals in the Straits of Gibraltar had occurred, sapropels should occur in the western Mediterranean, where they had not been recorded (but see McKenzie's comment below). There should also be a deep Atlantic isotopic record, which had not been seen. Furthermore, upwelling in the eastern Mediterranean should produce high sedimentation rates, but sedimentation rates were low. The observed disappearance of benthic fauna also did not fit the upwelling model. Proponents intended to use multi-purpose holes (i.e., sites of the Mediterranean Ridge program and reoccupation of DSDP sites). Cita-Sironi concurred with Shackleton's earlier general comments on the inadvisability of using other than optimal sites. Specific problems in this case were that some Mediterranean Ridge sites targeted diapirs and the deformational front, while MS required undisturbed pelagic sediment. DSDP sites also had disadvantages, e.g., presence of turbidites. However, MS had great potential and should be developed (Cita-Sironi was ready to help reshape it after she left PCOM). MS was technically straightforward and could be made a backup for FY93.

Discussion

McKenzie seconded Cita-Sironi's support of MS scientific potential. SGPP had ranked it highly. MS covered an exciting geochemical process with global implications. She pointed out that sapropels had been recovered in the western Mediterranean (by ODP) that were somewhat different from those in the east. McKenzie agreed that a transect was required. Kidd stated that no site-survey data had been submitted, but that sufficient data probably existed for what the proponents wished to do. However, proponents must choose sites. Natland saw MS as a potentially elegant exercise, while agreeing with the site location problem. It had global ramifications, but the Mediterranean provided a simplified example which would be a good place to drill. Austin said that PCOM must send a signal to the proponents that it was interested, but that they must do more. McKenzie reported that Kidd had proposed that SGPP become proactive in this instance. Shackleton stated that, as written, *JOIDES Resolution* was not required for MS, though it could be rewritten to require the drillship. Cita-Sironi stressed the importance of reaching the Messinian. Austin responded that that message must reach the proponents. Kidd noted that there were also sapropels in the Japan Sea. Austin agreed, adding that the proponents should also think globally.

NAAG-DPG

Austin explained that the NAAG-DPG chair, W. Ruddiman, had been unable to attend and that PCOM watchdog, Leinen, had moved to EXCOM. Larson would supplement Shackleton's earlier report.

While stressing that he was not opposed to NAAG drilling, Larson noted potential problems associated with the 2-leg NAAG program. 1) Cost: an ice support vessel would be required at a cost of $1.3M/leg. 2) Arctic ice comprised large, flat slabs, 3-5 m thick and was not amenable to towing or fire-hosing out of the way. 3) Scheduling, in the most favorable ice window, would be absolutely inflexible. (Larson recalled that CTJ had been originally dropped by DSDP so that the drillship could reach the Wedell Sea in the right weather window. *Glomar Challenger* actually passed over the CTJ sites *en route*. Larson warned that the same sort of decision might be required in scheduling NAAG.) 4) However, there was inherent flexibility in the NAAG drilling strategy, with fall-back sites to the south and the option of drilling on the east or west side of the Atlantic. Data for all sites would be needed. 5) Highest-priority sites were the furthest north and, therefore, the most difficult. A single leg would concentrate almost

totally above 70°N. (In addition, Larson recalled that Leg 105 drilling (Baffin Bay) encountered many glacial erratics.) 6) No site-survey data had been received by the Data Bank.

Discussion

Austin stated that site-survey data were on their way to the Data Bank. Kidd said that SSP expected that data would be available. There was also potential for more site-survey work. Baldauf confirmed that a cruise was scheduled, but Kidd pointed out that that would also be weather-dependent. Natland asked about options if the northern sites could not be reached by *JOIDES Resolution.* Shackleton replied that NAAG has been planned as a 2-leg program; he hoped that the second leg would reach northern sites if the first leg did not. There was certainly 1 leg of exciting science in the southern sites. Information on Fram Strait gateway paleoceanography and tectonics would be lost if northern sites were unreachable. He acknowledged that PCOM might have difficulty scheduling a second leg if only difficult sites remained. Larsen noted that there had been no interaction between NAAG-DPG and NARM-DPG. Austin replied that NAAG-DPG no longer existed, but that co-chiefs could interact. Shackleton felt that deep holes would subtract from NAAG objectives and that the strategy of combining sites was not useful.

NARM-DPG

Austin noted that both he and Tucholke were proponents.

Volcanic Rifted Margins

Duncan explained that volcanic rifted margin drilling was envisaged as a 4-leg program, with 1 leg/year. The first leg would comprise only 2 sites (EG63-1 and EG63-2). This program constituted a new campaign to understand these large, probably catastrophic, features, which could not be studied in terms of steady-state, present-day events. They related to oceanic plateaus and other large igneous provinces (LIPS).

LITHP and TECP had questioned age resolution. However, Duncan felt that age resolution of ~0.3 m.y. would be available using radiometric methods. This would be sufficient to distinguish spreading-rate changes. The 500 m of basement penetration, for a total of 940 m at EG63-1, seemed somewhat arbitrary. High-resolution, deep sections were needed for comparison with on-land sections. The 500 m was flexible and could be varied to produce a 1-leg program. Larsen noted that there had been pessimism about basement penetration rates. Duncan pointed out that the required 68 days on site for the first leg could be reduced at the expense of basement penetration, though EG63-2 was a re-entry site, which could be deepened in the future. Site-survey data were not yet in the Data Bank, but data distribution was dense and complete. Kidd reported that SSP's prognosis was good. SSP would like further data processing; additional cruises were planned.

Discussion

Malpas asked whether an ice picket boat would be required. Francis said he could not answer that, but Mutter felt that ice would not be a problem. Larsen added that there were icebergs in the region, but that they would only be a problem for the most landward site. Taylor stressed the budgetary implications of an ice-support vessel and the need to resolve the question. Larsen

replied that a fixed-wing aircraft would survey the area, but it might be useful to have a helicopter. These would provide days of warning of any iceberg threat. Kidd added that the experience of Leg 105 suggested that icebergs could be tracked. Taylor asked whether the leg would sail without an ice-support vessel, but Francis replied that he would have to reserve judgement. Natland stated that if the leg was reduced to 50 days, basement penetration would suffer. He felt that the schedule was optimistic. However, both sites were listed as re-entry sites. Taylor recalled that Leg 104 penetrated almost 1000 m of basement. The first volcanic margin leg might, therefore, accomplish all its goals.

Non-Volcanic Rifted Margins

Von Rad highlighted the NARM-DPG decision to focus on the Newfoundland Basin (NB) and Iberia Abyssal Plain (IAP) / Galicia Bank conjugate margins. The major constraints governing this choice were: 1) record of the complete history (syn-rift - breakup - post-rift evolution); 2) conjugate pair of asymmetric margins of the same segment; 3) plate tectonic history well established; 4) intermediate age (mid-Cretaceous), yielding a reasonably long subsidence history; 5) moderately thick sediment cover (but < 3 km) with fossiliferous and continuous sections; 6) wide (100-350? km) transitional crust between undisputed oceanic and continental sections; 7) minimal post-rift disturbance; 8) extensive geophysical and drilling data for definition of degree of symmetry; 9) well-defined intracrustal detachment fault (S-reflector, Galicia); 10) mantle exposures (serpentinized peridotite); 11) connections to land geology (Lusitanian, Jean d'Arc/Carson basins); and 12) logistically convenient for follow-up studies.

Objectives of non-volcanic rifted margin drilling were covered by Larsen in his report. NARM-DPG requested 4 legs of drilling. The first leg would comprise IAP-4 (peridotite ridge), IAP-2 (continental basement, pilot hole for IAP-1), and IAP-3B (oldest oceanic crust), for a total of 53 days. The second leg would be NB-4A, a single site to 2450 mbsf. IAP-1, to 2550 mbsf, would also require a full leg. GAL-1 on the Galicia Bank would study the enigmatic terrane overlying and landward of the peridotite ridge. The ultimate goal was to penetrate the S-reflector (4-5 km penetration). NARM non-volcanic drilling would test the simple shear model.

Von Rad went on to discuss problems and deficiencies of NARM non-volcanic drilling. 1) State of site surveys: identification of reflectors and basement was not yet satisfactory, especially for NB sites. However, MCS and refraction work was planned for 1992. 2) Most NB and IAP sites, except IAP-1 and NB-4A, were on basement highs and might not be representative crust. Furthermore, overlying sedimentary sections were incomplete, with the oldest post-rift sediment missing. Von Rad asked how subsidence rates for the pre-breakup and early post-rift evolution would be determined and how paleobathymetry (important for subsidence history) would be constrained. 3) Von Rad questioned whether all important tectonic and crustal questions could be solved by drilling. Could the crustal rocks be dated and did they contain enough clear signals from geochemistry, petrology and microdeformation to permit determination of their origin and deformation history? 4) Tracing of important sequence boundaries from inner to outer margin was difficult or impossible because seismic stratigraphy was not clear or because of intervening high blocks. 5) NARM-DPG report should still be filtered by thematic panels, especially OHP, SGPP and LITHP, for coverage of, e.g., Mesozoic paleoceanography, sea-level history, complete Jurassic/Early Cretaceous sections for Tethyan connections, mid-Cretaceous anoxia, etc. 6) Von Rad questioned whether the total depth and drilling time estimates might be over-optimistic.

Discussion

Because Austin was a proponent, Duncan chaired discussion. In response to a question from Natland, von Rad said that objectives of the first leg would be the peridotite ridge, continental crust and the oldest oceanic crust. However, IAP-3B (oldest oceanic crust) could yet be dropped in favor of the Galicia site, GAL-1. Natland asked who would make that decision. Taylor assumed it would be PCOM's decision and Austin noted that PCOM would return to that point. Von Rad felt that proponents, or a subgroup of NARM-DPG, should be asked to refine the first leg. Austin reminded PCOM that NARM-DPG had not yet been disbanded. Larsen reported that there had been mixed opinions among NARM-DPG members as to whether GAL-1 should be drilled early or late. It was decided to keep it open as an option that could be drilled at any time. PCOM should consider S-reflector drilling (4-5 km penetration). Though not realistic at present, a minority group within NARM-DPG (including Larsen) favored it. It would affect future planning. In view of the concerns expressed by von Rad, Mutter felt disappointed that an approach to the S-reflector had received low priority. He felt that it might be accomplished with <4-5 km penetration and asked why the S-reflector was not the priority of the first leg. Larsen stated that 4-5 km was a realistic estimate of the requirement. Depth and geometry were not absolutely controlled, but it seemed impossible to drill the unequivocal S-reflector with <4 km penetration. In response to a question from Watkins, Larsen explained that the S-reflector became non-unique where it was shallower.

TAG Hydrothermal (TAG)

Becker pointed out that PCOM would be considering the first leg of a multi-leg program at the TAG hydrothermal field. He noted that Humphris was a proponent. TAG was LITHP's top-ranked program and had been a high global priority of LITHP's for a couple of years. SGPP also ranked TAG highly.

The objective of TAG was to investigate hydrothermal processes at a large, mature sulfide deposit in an unsedimented, slow-spreading setting. There were 4 priorities of sites in a 3-leg program: 1) nature and distribution of deposits in near-surface discharge zone, dynamics and physics of flow (3 holes, each 200 m penetration); 2) sub-seafloor mineralization in stockwork/root zone (deepen one hole to 500-600 m); 3) nature of reaction zone (deepen to 1.2-2 km); and 4) nature of recharge zone (500-1000 m hole). The first leg would address priorities 1) and 2) by drilling at a 50 m-high, active mound with hot (360°C) vents at the top. Leg 139 successes with high-temperature drilling and measurements had generated optimism about TAG.

Discussion

Duncan discussed issues and concerns related to TAG drilling. 1) Would DCS be required, or could the first leg be drilled with RCB? (Leg 139 only penetrated 100 m with rotary drilling). 2) TAG was not a suitable location for an engineering leg since that would disrupt the flow regime. 3) Long-term monitoring of the system before, during and after drilling would be required. 4) LITHP had requested a TAG-DPG to discuss strategy, hole locations and downhole measurements. 5) Inadequacy of site-survey data data, which had already been discussed; Becker questioned whether TAG would be ready for drilling early in FY93. The location had been well-covered by *Alvin*, Seabeam, OBS studies of natural seismicity, and some heatflow measurements. A proposal for an additional survey existed, to take place in late 1992 or early 1993, and include 3.5 kHz, multibeam, high-resolution imagery, gravity and deep-tow magnetics, dredging and cores, but no seismics. SSP had highlighted the need for

seismic data, especially for deeper goals. Kidd stated that some on SSP would like to see a data package of the quality of that for Sedimented Ridges, but such a package did not exist for TAG. SSP felt that it would be best not to schedule TAG early in FY93.

Taylor commented that the difference between Middle Valley (Sedimented Ridges) and TAG was the absence of sediment at TAG. Heat-flow measurements could not be conducted on bare rock. Taylor asked what other site-survey work could be done, and Mutter asked what type of seismic data SSP felt was needed. Kidd agreed with Taylor's comments, but stressed that no data at all had yet been received. As for seismics, some members of SSP thought deep tow seismic data were required. Natland noted that TAG fulfilled a long-felt wish, but that it had always been assumed that DCS would be used. To predicate TAG on 200 m rotary holes assumed that basement rocks had been sufficiently altered to allow rotary coring. Natland doubted that this would be the case and felt that TAG needed DCS. He asked what would be the difference between disturbing the hydrothermal system with DCS on an engineering leg and disturbing it with rotary drilling on a scientific leg. Becker replied that, on a scientific leg, instruments could be installed. Natland reiterated that he did not think TAG drilling would be successful without DCS.

NEW JERSEY SEA LEVEL / MIDDLE ATLANTIC TRANSECT (NJ/MAT)

McKenzie stated that the NJ/MAT program strategy was based on the results of a JOI/USSAC workshop, *Role of ODP Drilling in the Investigation of Global Changes in Sea Level* (1988, El Paso, J. Watkins and G. Mountain, conveners). NJ/MAT also followed the strategy expected to emerge from the ongoing SL-WG and comprised part of a global sea level strategy, which included A&G drilling. NJ/MAT focused on the "ice house" part of the geological record, specifically late Oligocene - Miocene.

There was a need to drill sequences to determine their lithologies and ages in order to test the revolutionary technique of sequence stratigraphy. Drilling of transects may yield sea level amplitudes. NJ/MAT drilling results would be tied into the deep-sea oxygen isotope record and onland outcrops and boreholes. NJ/MAT comprised 12 sites. *JOIDES Resolution* could drill the deeper-water part of the transect and a supplemental platform would be required for shallow-water drilling. In total, it was more than a 1-leg drilling project. Kidd commented that NJ/MAT had been one of the few programs for which SSP saw data. The data were of high quality and included new MCS. A structural high existed that might cause safety concerns. When the new data had been fully processed there would be more than enough data. McKenzie stressed the need for drilling to occur within a May - August weather window. Sands and silts were likely to be encountered and their recovery may present problems. The VPC would be useful.

Discussion

Lancelot asked how results were expected to compare to those of DSDP legs 93 and 95 and whether SL-WG had looked at NJ/MAT. Watkins answered that SL-WG was not considering proposals, but that it was aware of NJ/MAT. The proponents were members of SL-WG. McKenzie added that NJ/MAT formed the shallow-water part of the transect begun on legs 93 and 95. In response to a question from Mutter, Francis said that the May - August weather window was required because it was planned that *JOIDES Resolution* would drill in as little as 51 m water depth in DP mode. Austin added that weather of NJ was generally better in the spring than in the fall. In response to questions from Taylor, Austin said that the decision to use *JOIDES Resolution* for such shallow sites would only be partially influenced by the

outcome of the upcoming test of the drillship's shallow-water drilling capability at Enewetak. Even if that test was successful, there would be no guarantee for NJ/MAT. The sister ship of *JOIDES Resolution* had drilled in 50 m water depth using a taut wire. A taut wire would also be used off NJ. Von Rad recalled that Leg 93 encountered problems with coarse Miocene sand. In response to a question from Watkins, Francis reported that the VPC was on the priority list, but that it was not yet ready. Mutter asked whether NJ/MAT could stand alone if no supplemental platform drilling or onland drilling occurred. McKenzie's opinion was that much could be done from onshore outcrops. Austin added that OPCOM specifically mentioned NJ/MAT as a target for funds for a supplemental platform. Taylor stated that NJ/MAT could stand alone, but that it would simply not drill all of the targeted sequence boundaries. Responding to a question from Natland, Austin said that NJ/MAT was not a candidate for DCS. Tucholke asked whether the structural high predated the sequence boundaries. Kidd and Austin identified the high as the Great Stone Dome and confirmed that it was older than the sequences.

VICAP GRAN CANARIA (VICAP)

Malpas described the intent of VICAP, to drill through a clastic apron to study early evolution of an intraplate volcanic island. He listed the objectives of the VICAP program as: 1) total and partial volumes of clastic contributions; 2) unroofing and erosion rates of a volcanic island; 3) high-resolution biostratigraphy and paleomagnetic stratigraphy in the volcanic apron and interfingering non-volcanics; 4) chemical flux between components, especially volcanic glass - seawater, maturation of organic matter in proximal facies close to the hot interior and low-temperature diagenesis at a distance; 5) volcanic episodicity and cyclicity; 6) life and differentiation of magma chambers; 7) evolution of submarine building phase; 8) lithosphere loading; and 9) local geologic problems.

VICAP proposed 5 holes with penetrations of 1-1.5 km and 3100-3600 m water depth and constituted >1 leg of drilling. Some site-survey work had been carried out; more was planned. Malpas listed the strengths of VICAP as: 1) sedimentology and mass balance questions were interesting (SGPP interest); 2) pore-water chemistry in contrasting horizons (SGPP interest); 3) evolution of submarine building phase (LITHP interest); 4) lithosphere loading (TECP/TECP interest); and 5) well-written and presented. Malpas summarized VICAP's weaknesses as: 1) Canaries were too close to the continental margin and might not be the best place for such work; 2) sediment input was derived from a number of island sources, not just Gran Canaria; 3) slumps might cause problems with biostratigraphic evolution; 4) improved site-survey data were required, e.g., deeper seismics for the lithosphere-loading question; 5) recovery of sands; and 6) the work might be possible with onland drilling alone.

Discussion

Kidd had little to add. SSP had questioned adequacy of available MCS data for lithosphere-loading problems. An upcoming GLORIA survey would not help to identify older slumps. In response to a question from Natland, Malpas said that there had not been any attempt to link strategy to models. Von Rad stated that the VICAP proposal was not mature, but that Site 397 had been drilled nearby and recovered hyaloclastites and air-fall ash; drillability and biostratigraphy there were very good. Austin expressed concern about interaction with the nearby continental margin. In response to a question from Natland, Malpas said that the sediment aprons were several km thick. Tucholke commented that similar work on the New England Seamounts had obtained poor biostratigraphy. McKenzie stated that interbedded continental material would contain pelagic microfossils for biostratigraphy. Lancelot felt that

drilling off-island would yield better biostratigraphic control and that a transect was needed. Austin reiterated the problem of sediment instability, but McKenzie thought that the frequency of sediment redeposition was high enough so that biostratigraphic control would be unimpaired. Kidd confirmed that biostratigraphic control did exist near the VICAP area.

AMAZON FAN (AF)

Austin noted that AF (proposal 405) was one of 2 new proposals, not in the NAP, ranked by thematic panels, the other being the K/T impact proposal (proposal 403).

McKenzie explained that SGPP had felt that AF was mature and decided to rank it. AF would study the Amazon deep-sea fan growth pattern, its relationship to equatorial climate change, continental denudation and sea-level fluctuations. McKenzie listed the thematic objectives of AF as: 1) fan morphology and growth patterns; 2) testing the validity of the Vail/EXXON conceptual deep-water sequence stratigraphic model; 3) continental climatic record in fan sediments; 4) equatorial oceanic dynamics and paleocirculation patterns. Kidd added that, though SSP had not seen the site-survey data, a large amount of data was available.

Discussion

Shackleton stated that OHP also reviewed AF. AF was probably the most interesting fan to OHP and the proposal was well-written. McKenzie pointed out that there was the potential for drilling gas hydrates derived from organic carbon supplied by the Amazon. Tucholke asked in what ways AF was different from the Mississippi Fan. McKenzie stressed the importance of the continental climate record. Austin commented that the data for AF were originally brought to the JOI/USSAC South Atlantic workshop in 1987. Seismic facies there could be studied with ~100 m holes because the facies were smeared, rather than stacked as in the Mississippi Fan. McKenzie added that 19 sites were proposed with penetrations of 50 m - 625 m. Lancelot felt that AF should be part of an experiment involving the Mississippi Fan as a temperate example, AF as a low-latitude example, and the Indus Fan as a monsoonal example. He thought that the framework should be global. However, Austin noted that that was not a deficiency of the AF proposal. Moores stated that AF was not of interest to TECP. Kidd commented that, since Mississippi Fan drilling (DSDP Leg 96), there had been a revolution in understanding how fans build. AF was a very important example and all of the proposed objectives could be accomplished by APC and XCB.

K/T IMPACT

Moores reported that K/T impact (proposal 403) proposed to drill an impact structure off the Yucatan Peninsula, large enough to have produced the K/T extinction. No core data existed, though there were impact deposits on Haiti. TECP had rated K/T impact highly because of the debate over impact versus plume models for triggering Indian Ocean plate motions, though the theme was not in TECP's white paper. In addition, there was great general interest in extinctions and the proposed drilling would give ODP a high profile. K/T impact comes with much supporting data from UTIG.

Discussion

Larson asked about the option of drilling on land. Moores replied that the marine section was more complete. Austin added that PEMEX had drilled and recovered some shocked quartz, but that cuttings had been lost. However, the Haiti ejecta blanket did not map to this crater, but to one further south. Humphris stated that LITHP reviewed K/T impact because of its high visibility. LITHP's concerns were: 1) possibility of land drilling, 2) adequacy of biostratigraphic resolution for determining timing, and 3) assumption that APC and XCB will yield better recovery than was obtained at nearby DSDP sites. Larson asked what more would be learned, even with good biostratigraphic resolution, than could be learned with a shovel on Haiti. Austin explained that onland drilling in Mexico would involve regulatory problems since the area was a petroleum province. It might be possible eventually to have a paired onshore and offshore approach. Moores remarked that studies of melts indicated multiple sources, suggesting an impact origin. McKenzie noted that SGPP had felt that insufficient care had been taken in choosing sites. Austin confirmed that K/T impact had been generated rapidly, adding that it would probably benefit from another review cycle. Watkins stated that the data needed reprocessing. Duncan asked whether any of the sites were located inside the crater. Moores replied that none of the 6 sites were within the crater, since it lay in Mexican waters and the water depth was very shallow. Austin commented that the proponents wished to use the leverage of ODP to enable them to drill in Mexico. The inboard sites were in Mexican waters.

THEMATIC PANEL RANKINGS

Austin referred to the blank schedule showing critical time windows for NAAG and NJ/MAT (Agenda Book, blue page 25) and to summaries of thematic panel rankings (Agenda Book, blue pages 26-27). He called on thematic Panel Chairs to summarize their NAP rankings.

LITHP

Humphris explained that LITHP had to allow proponents to remain in the room for voting because there were so many of them; they were not allowed to vote for their own proposals. They were present during discussion, but were not present during presentation of their proposals, and were not allowed to comment on comments of other panel members concerning their proposals. Humphris (a TAG proponent) had handed over the chair during discussion of TAG. LITHP's ranking yielded 3 proposals clumped at the top and distinct from the rest. LITHP judged AB, MS and NJ/MAT outside their mandate and did not rank them. LITHP designated 1 leg for ranking for each multi-leg program. LITHP did not want to rank MAR proposals and risk second-guessing OD-WG, but LITHP had felt that MARK was more drillable.

The LITHP ranking (top 3) was: 1) TAG, which was also LITHP's top program in its 1991 global ranking; 2) NARM volcanic (LITHP accepted NARM-DPG's suggested first leg); and 3) MAR (offset drilling was a high LITHP priority and LITHP felt that MARK was drillable).

TECP

Moores reported that TECP had fewer proponents than LITHP. DPG chairs were absent during discussion and did not vote. One other proponent was absent from both discussion and voting and another was absent from discussion, but was present for voting (but did not vote on

his own proposal). The TECP ranking (top 6) was: 1) NARM non-volcanic, 2) NARM volcanic, 3) EAT, 4) AB, 5) K/T Impact, and 6) MAR.

TECP accepted conclusions of NARM-DPG. Moores justified TECP's ranking by noting that rifted margins was the top TECP theme. Furthermore, North Atlantic conjugate margins were the best examples globally; South Atlantic margins were good, but less well-documented, Indian Ocean margins were complex (plate motion changes), and the conjugate to the south Australian margin was in Antarctica. This was a good example of how to address tectonic themes with the drill. The TECP white paper identified the following major problems associated with non-volcanic rifted margins: distribution of strain during rifting, quantitative distribution of volcanism and intrusion, distribution of flexural strength, and mechanisms of deformation. The end members to be studied were: 1) volcanic and non-volcanic, and 2) pure shear and simple shear. Volcanic rifted margins comprised a new and exciting theme, hypothesis-based, involving plumes and the transition to non-volcanic types. EAT was a major plate boundary. Of MAR proposals, Vema was felt to in the best condition for drilling from a tectonic standpoint. It had the potential, with further work, to become highly ranked. TECP felt that MARK was immature. Taylor commented that TECP had repackaged NARM non-volcanic, leg 1. Moores responded that TECP would leave GAL-1 open to retain flexibility.

OHP

Shackleton explained that OHP divided proposals into 2 groups. OHP voted with 2 proponents absent on the 3 proposals of primary interest to the panel. OHP voted one place at a time and produced the following ranking (top 3): 1) NAAG, 2) NJ/MAT, 3) CR. All OHP members were present for voting on remaining proposals.

Neogene vertical and horizontal transects for paleoceanographic reconstruction were a goal of OHP. Subsequently, the same approach was envisaged for the Paleogene. Most components were laid out in COSOD II and OHP's white paper. For the Neogene, high northern latitudes were lacking. Leg 145 (NPT) and NAAG would address this deficiency and both also had major Paleogene components. Low latitudes had been covered by legs 108, 115, 130 and 138, with perhaps CR to come. Until new site-survey data were obtained, OHP would not know how well Paleogene objectives at CR would be achieved. Sea level was within the mandates of both OHP and SGPP. Shackleton had feared that it might slip between them and not receive adequate coverage. However, NJ/MAT was an excellent proposal and would match SL-WG's recommendations.

Shackleton announced that new NAAG proposals would be coming into the system before 1993. In addition, NAAG I would have implications for NAAG II. OHP would like to have a planned NAAG II leg ready for evaluation by PCOM at its 1993 Annual Meeting. However, OHP's single expert might be a co-chief of NAAG I. OHP would be poorly qualified for the serious and rapid work that must be done. Therefore, a NAAG II DPG would be desirable. Since OHP wanted 2 years between NAAG legs, the DPG need not meet until 1993.

SGPP

McKenzie stated that SGPP ranked all NAP proposals and added AF. SGPP ranked the Mediterranean Ridge and Alboran Basin proposals separately. The single proponent left for discussion and returned for voting, though he did not vote on his own proposal. The total score for each proposal was divided by the number voting to produce the ranking. SGPP was

very enthusiastic about its highest-ranked proposal, NJ/MAT. SGPP's ranking (top 5) was: 1) NJ/MAT, 2) MS, 3) AF, 4) Mediterranean Ridge, and 5) TAG. SGPP discussed maturity and decided that should be a PCOM decision, with advice from SGPP. SGPP, therefore, ranked on the basis of scientific interest. SGPP considered that its number 1 (NJ/MAT) and number 3 (AF) ranks were ready for drilling. MS had already been discussed, but a drilling leg could be put together quickly if necessary. Mediterranean Ridge was not mature; a revised proposal was expected. TAG had already been discussed.

Discussion

Taylor asked whether thematic panel input would be provided on the issue of an additional test of DCS IIB. Austin recalled that the recommendation for at least one more deployment of DCS IIB had come from the DCS review meeting. The deployment should preferably be in a different environment from that at EPR. Storms explained that the DCS hardware would have to be modified in the US beyond Leg 150 to produce DCS III. Therefore, the DCS IIB test should be as early as possible. Taylor asked whether LITHP preferred an engineering test of DCS to a high-priority science leg. Austin responded that it had been the view of PCOM in the past that DCS should be tested at sites of high scientific interest. He added that he preferred not to schedule too far into FY94 because funding for that period was uncertain. He suggested waiting for the results of DCS engineering Leg 142 before scheduling another DCS test (i.e., at the April, 1992, PCOM meeting). Taylor stated that that might not be possible, given the need to schedule the engineering leg prior to Leg 150.

Kidd emphasized SSP's recommendation that alternate legs be included in the FY93 schedule when the site-survey data in hand for the primary leg are inadequate. Austin pointed out that that was also a PANCHM suggestion. The alternate would act as a spur to proponents. The final decision on which legs to drill could then be made at the April, 1992, PCOM meeting.

Francis suggested that if a science leg suitable for an engineering test of DCS IIB was scheduled, PCOM need not yet decide on whether to make it an engineering leg. Taylor strongly disagreed, noting the big difference between a science leg and an engineering test. However, Austin remarked that PCOM would have to decide whether all deployments of DCS II would always be considered tests, or whether to consider it an interim tool. Larsen stated that it had been suggested for use on one of the NARM legs and asked about the effect of such a plan. Austin replied that penetration would be reduced because DCS IIB was very slow. In addition, it would permit only a limited logging array. Duncan suggested postponing the decision until after Leg 142, but Austin acknowledged the need to deploy DCS on Leg 147, 148 or 149. Taylor stressed that EPR needed DCS, but that other high-priority legs could be drilled with other tools. Austin said that PCOM might choose not to schedule a DCS test, but that TEDCOM and ODP-TAMU wanted one. Malpas suggested HD, but Storms replied that the maximum DCS IIB drill string was only 4500 m, unsuitable for HD.

Detailed Planning for North Atlantic Drilling

Austin explained that PCOM should develop a ~5-leg program for FY93. An engineering leg could be included and scheduling could extend into FY94. PCOM might choose to drill each panel's highest priority, to drill multidisciplinary objectives, or to drill something new (Agenda Book, blue pages 30-31). Austin had provided a suggested schedule for discussion (Agenda Book, blue page 31). Mutter stressed that votes for LITHP's top 3 programs were statistically inseparable. Austin added that might also apply to OHP's ranking. In general, below rank 4-5 there was little statistical significance to thematic panel rankings and that should be borne in

mind. Discussion would be restricted to PCOM, with Panel Chairs present for information only.

Discussion

Natland stated that the level of planning appeared to have deteriorated; not many programs were ready for drilling. NARM volcanic and non-volcanic, NJ/MAT and NAAG were ready, but there were reservations about TAG. MAR and AF could be drilled. Mutter felt that EAT was mature and Austin acknowledged that site-survey data were extensive. Natland felt that TAG either needed DCS or required reconstruction. Austin agreed that TAG was not ready. Taylor disagreed, noting that the shallow component was ready for drilling and did not need DCS. He added that TAG was a very high LITHP priority and 1 leg was drillable. Becker asked the opinion of ODP-TAMU engineers. Storms responded that prospects for TAG were good if drilling conditions were like those of Leg 139. Lancelot felt that MARK was more suitable than TAG, based on data availability. Austin noted that in neither case were the data in the Data Bank. In response to a question from Austin, Humphris said that MARK and TAG were very close in LITHP's ranking. Malpas added that LITHP would prefer to include TAG later in FY93, rather than sooner. Austin suggested placing a TAG place holder in FY94, as was done with HD (actually in FY93) in FY92 scheduling. Alternatively, MARK and TAG could be scheduled as alternates. Natland maintained that TAG needed DCS or reconstitution, along the lines of Taylor's comments, as a shallow sulfide leg. The existing TAG proposal was not like that. PCOM could schedule MARK and TAG as Leg 153 and have the proponents compete. Humphris asked when the final decision would be made on which alternative to drill. Austin replied that the situation would be reviewed continuously, but that PCOM would have to decide no later than August, 1992. Humphris pointed out that the TAG site survey proposal was under review and the results could not be ready until early 1993.

Mutter proposed excluding some proposals from consideration. Austin suggested MS. Cita-Sironi stressed that MS was technically straightforward. However, Austin stated that *JOIDES Resolution* would still be in the area in FY94. He preferred not to schedule immature programs above mature programs because that would send a bad signal to proponents. Austin felt that excluded MS, AB, VICAP, CR, MAR (Vema) and K/T Impact. Taylor noted that Vema was the best place for an engineering test because the water depth was <1000 m in places, but deep water test sites were also available. Austin stated that, if the engineering test was not to be in a region of scientific interest, then he would prefer to have it in a different geological environment, e.g., chert/chalk, in order to interest another community, besides the lithosphere community, in DCS. Storms agreed, but stressed that one objective was coring experience. Deploying once in fractured volcanics at EPR and the second time in a different lithology meant starting again at the bottom of the learning curve. Austin felt strongly that, in order to justify the cost of DCS III, there was a need to appeal to a broad community. Storms expressed the belief that a water depth of 1000-2000 m would be adequate to test DCS IIB heave compensation, while minimizing trip times. Austin acknowledged that Vema was a possibility for an engineering leg, but that MARK was the only MAR proposal ready for a scientific drilling leg.

Austin stated that both TAG and MARK would probably be drilled, since *JOIDES Resolution* was committed to the Atlantic until April, 1994. He favored MARK being first because its data were better. Malpas agreed that TAG and MARK could be scheduled together in FY94, "up front". Shackleton recalled that at the 1990 PCOM Annual Meeting, Pacific drilling was being finished off, so scheduling beyond FY92 into FY93 had been reasonable. However, in this instance there was no need to lock in time in FY94. Austin explained that any programs scheduled for FY94 would be place holders to encourage proponents. Malpas agreed, noting

that TAG and MARK represented top global priorities. Austin said he would rather not schedule MARK early to allow more work on site-survey data. Mutter and Lancelot felt that MARK was ready for drilling. Moores proposed asking the proponents to include tectonic objectives. Duncan thought that it would also be better to await OD-WG's report.

Cowan argued in favor of giving 3 legs, and perhaps 4 legs, to NARM in order to do it properly. Now was the time to devote more than the bare minimum to it, rather than scheduling every panel's top priority. Austin pointed out that NARM-DPG had requested 1 leg/yr in each category (i.e., volcanic and non-volcanic) for a phased approach. Von Rad expressed agreement. Cowan asked why three relatively shallow holes had been proposed for the first leg of NARM non-volcanic drilling instead of a deep hole. Larsen replied that the idea had been to learn from the first leg before tackling a deep site. He noted that the NB deep site (NB-4A) might be easier than the IAP deep site (IAP-1). Cowan asked why IAP-1 deep drilling had been deemed too difficult. Von Rad explained that shallower IAP sites would act as pilot holes where hole stability and basement drillability could be evaluated. Austin added that there were hydrocarbon concerns on the NB side. New data were required before attempting a deep site there. He reiterated that deep drilling was also an issue of community will. Taylor supported Cowan's idea to proceed with deep drilling. Cowan explained that if technology was the problem, he would postpone deep drilling; otherwise, he had the will. Mutter felt that it was not clear how drilling 600 m in post-rift sediment would enable assessment of hole stability in syn-rift sediment. Storms responded that IAP-1 was also in deep water. It would involve long casing and drill-pipe strings. That was risky and ODP-TAMU was not comfortable starting out there. Mutter stated that if ODP does not drill these deep holes it will be "dancing around" fundamental problems. Von Rad noted that the water depth at NB-4A was shallower and that the site would be ready for drilling in FY94. Larsen explained that NARM-DPG preferred to drill the NB deep site before the IAP deep site since this approach would provide information on asymmetry. Mutter felt it would be necessary to drill on both sides of the Atlantic. Tucholke pointed out that there was a horizontal unconformity on the NB side, but not on the IAP side, suggesting asymmetry. It was important to drill the unconformity to determine whether it was subaerial. In response to a question from Austin, Larsen said that even without ODP-TAMU's engineering warnings, NARM-DPG would not have chosen deep sites for non-volcanic leg 1 because it wanted to be sure to reach basement.

Austin asked whether any PCOM members were against NARM non-volcanic. Mutter replied that it would depend what it comprised. Austin highlighted the NB data problem. Taylor suggested that, in that case, all NARM non-volcanic should be deferred until FY94 so that a deep hole could be the first drilled. Mutter asked whether the discussion implied that, if there was to be any NARM non-volcanic drilling in FY93, it would be shallow-penetration. Austin replied that IAP-1 could be attempted in FY93. Larsen stressed that NARM-DPG preferred to begin with shallow holes, but could accept the NB deep site if PCOM wanted it. NB-4A was NARM-DPG's choice for the first deep site. Austin asked whether PCOM accepted NARM-DPG's rationale. Von Rad agreed that ocean/continent transition problems were an important objective. Austin noted that a great deal of sediment would be drilled on a NARM non-volcanic leg and asked for SGPP's thoughts. McKenzie stated that NARM non-volcanic fell at the bottom of SGPP's fall ranking because SGPP's liaison to NARM-DPG (N. Christie-Blick) had expressed concerns, though he had felt that the continent/ocean transition was an achievable objective. McKenzie acknowledged that she was unfamiliar with the stratigraphy. However, she added that the sediment story had never been developed by the proponents. Kidd stated that he was a proponent of an upcoming proposal to study abyssal plains and sediment budgets; this would be one of the targets of NARM non-volcanic drilling.

Austin asked whether there were any "golden spikes" that everyone agreed should be in the schedule. There was general agreement on NJ/MAT and NAAG. Weather constraints required these to be legs 150 and 151, respectively. Taylor felt that NARM volcanic should also be a definite. Larsen felt that the September-November time slot suggested by Austin was reasonable. Cowan asked whether limiting NARM volcanic to 1 leg was providing enough time to achieve basement penetration. Austin responded that the initial approach already involved too many days for a single leg. He wondered whether there might be any flexibility in leg length for NARM volcanic. Natland said that was not a problem, since re-entry sites were proposed for NARM volcanic, leg 1. Malpas expressed reservations about NARM volcanic because he was not convinced that 1 leg would yield any new information. Larsen agreed with Natland that re-entry cones meant that sites could be revisited. He cautioned against extending the leg further into the winter. Concerning Malpas' reservations, Larsen explained that only 10% of the whole volcanic phase was exposed on land and that had been contaminated by reaction with continental lithosphere. There was a need to sample away from that contamination. The inshore site would check for contamination and the offshore site should be in uncontaminated volcanics. In response to a comment from Natland concerning LITHP objectives, Humphris stated that LITHP had focused on young crust, but that it did have interest in thick, volcanic margin volcanics. In relation to LITHP's other objectives, this had ranked highly on 2 occasions: the spring (global) and fall (NAP), 1991, rankings. The high ranks were partly due to the existence of a mature proposal. Interest in younger crust remained stronger on LITHP, but it was important to study early rifting processes, too.

Austin, noting that the re-entry sites represented an attempt to get a volcanic margins program started, asked whether there were any objections to an initial 2-site approach. Malpas favored dropping NARM non-volcanic. Cita-Sironi favored NARM non-volcanic, but preferred to begin with a deep site. Von Rad supported NARM non-volcanic at IAP and NARM volcanic. He also suggested a return to Hole 504B after HD. Larson, noting the broad thematic panel support for NARM volcanic, said that PCOM had better have a good reason if it dropped it. Lancelot felt that it would not be a good approach to put 504B in the schedule at the present time, though he was sympathetic to 504B drilling. A balanced program would involve one of the lithosphere objectives (MARK was more ready than TAG), one non-volcanic and one volcanic NARM leg, NAAG and NJ/MAT. Taira felt that both NARM volcanic and non-volcanic were necessary in FY93 and preferred NARM-DPG's approach to NARM non-volcanic, rather than a deep hole. Jenkyns endorsed Taira's statement. Austin asked whether or not PCOM wished to follow NARM-DPG's recommendations. PCOM needed to make a commitment. Natland endorsed Lancelot's suggestion, including drilling at MARK, rather than TAG. He did not mind when 504B was drilled.

Austin suggested making a philosophical commitment to HD as Leg 147 and NARM volcanic as Leg 152. A straw vote showed a clear majority favored adherence to NARM volcanic, leg 1 as put forward by NARM-DPG. Austin then asked whether a return to Hole 504B should be included as Leg 148. Malpas suggested asking LITHP to decide between 504B and MARK. Humphris was not sure that it was fair for her to make such a choice on behalf of LITHP. Tucholke was reluctant to schedule MARK before OD-WG had reported. Malpas agreed and suggested a return to 504B. Francis commented that MARK would be an expensive leg and would involve budgetary considerations. Austin stressed that PCOM must decide at this meeting. He suggested a straw vote on Hole 504B as Leg 148. However, Taylor said that PCOM should consider balance involving Hole 504B, TAG and MARK. LITHP ranked TAG above MARK; Taylor thought, therefore, that TAG should be drilled. Malpas asked when the next opportunity to drill 504B would arise if it was not made Leg 148. Austin replied April, 1994. Austin was not comfortable with scheduling TAG because of data deficiency. Furthermore, LITHP had wanted a TAG-DPG. Taylor stated that he objected to MARK because PCOM had no drilling package before it. Austin responded that OD-WG would

provide that. Humphris stated that she was now prepared to speak for LITHP since it was impossible to contact the rest of that panel and PCOM was determined to make its decisions immediately. She suggested placing 504B into the schedule now, with the idea that MARK would be ready when OD-WG reported and could be scheduled in FY94. TAG, following further site survey work and perhaps a DPG, would also be ready for FY94. Humphris added that scheduling TAG as Leg 153 would send a positive signal to LITHP. Austin responded that he preferred to have LITHP work with proponents on TAG, rather than set up a TAG-DPG. However, he was in favor of scheduling TAG as Leg 153. Mutter recalled Tucholke's comment that MARK needed more work, pointing out that a great deal of data already existed for MARK. Tucholke explained that he felt that site locations and drilling objectives should be better defined. He added that OD-WG was supposed to be setting up testable hypotheses. Austin said that OD-WG was awaiting instruction from PCOM. PCOM could instruct OD-WG to examine MARK. Lancelot felt that, because OD-WG started late, its philosophy was lagging behind proposals. The sites were there; MARK was ready and stood by itself. Austin stated that PCOM had delayed on setting up OD-WG partly for financial reasons, but also because PCOM had asked LITHP to develop an offset drilling strategy. LITHP had declined. Moores added that one of the MARK proponents felt that the proposal needed work. Moores stressed that MARK had tectonic, as well as lithosphere, objectives. Tucholke agreed that OD-WG must address tectonic development of MAR. HD was not a tectonic proposal, but had purely lithosphere objectives. There was more uncertainty concerning MAR. However, Mutter recalled that SSP had recommended against drilling HD without clarifying its tectonic development. Austin favored allowing OD-WG time to work. Moores stated that the objective of the existing program for HD was to drill lower Layer 3. The offset drilling element of HD was premature. However, MARK did have tectonic objectives. He agreed with Tucholke's viewpoint. Francis suggested making Leg 148 an engineering leg at MARK. Taylor noted that MARK proposed 2 sites: MARK-1 to drill gabbro through a proposed detachment; MARK-2 to drill serpentinized peridotite. Therefore, while there were potential tectonic objectives, MARK as it stands was an exploratory drilling proposal. OD-WG did not see MARK as one of the best places for offset drilling. Tucholke agreed, but recommended against committing to an exploratory phase when tectonics can be incorporated by OD-WG.

A majority of PCOM agreed and favored delaying MARK drilling. Austin was prepared to schedule MARK as Leg 153 provisionally and was sympathetic to scheduling TAG similarly, i.e., making Leg 153 MARK/TAG, not as alternates, but as a signal to proponents that both would very likely be drilled and to get their data ready. Cowan was against scheduling as far ahead as Leg 153. Malpas suggested making a statement that PCOM considered both MARK and TAG to be of high priority, as an alternative to pencilling them into the schedule. Austin replied that, in that case, other programs should be included in the statement, e.g., CR and EAT. Kidd stated that the concept of scheduling MARK and TAG as Leg 153 was exactly the idea SSP had proposed, that was to encourage proponents to action by scheduling alternates. Lancelot felt that the main reason PCOM was considering adding TAG/MARK was because PCOM was pushing high-priority LITHP objectives back. Watkins thought that to include only TAG and MARK would be to discourage other proponents. Austin suggested including other programs of high priority in the minutes. Watkins agreed that proponents could read the PCOM minutes and learn the status of their proposals. Austin proposed a slightly more formal listing of high-priority programs for inclusion in the minutes. Malpas pointed out that thematic Panel Chairs would take this information and would act on it quickly.

Francis emphasized that if a DCS IIB test was not inserted into FY93, the next test would not take place until 2 years after Leg 142. He again suggested that Leg 148 be a DCS IIB test at MARK. Austin was sympathetic to scheduling an engineering leg as Leg 148 or Leg 149. Mutter agreed that the engineering test program must be pursued effectively. Malpas expressed concern that an engineering leg was being played off against a high-priority lithosphere leg. He

felt the engineering leg should be evaluated against all other legs. Austin accepted that as a valid point. He asked whether a DCS IIB test in FY93 was important. In response to a question from Tucholke, Francis said that DCS III would not be available in FY93. DCS IIB needed another deployment, a recommendation endorsed by TEDCOM. MARK was attractive because it was of the right water depth and involved a different geological environment from EPR. Cowan stated that support for a DCS IIB test would depend on what it replaced. Austin reminded PCOM that ODP was spending millions on DCS. Lancelot supported a DCS test if ODP-TAMU engineers felt they needed one. Natland agreed that it was important to test DCS soon. Austin cautioned that money might not be forthcoming from funding agencies for further DCS development if PCOM did not commit to further testing. Taylor preferred to review results of Leg 142 and consider displaced science before deciding on another engineering leg. Austin warned that failure to continue with DCS tests might lead to DCS being cancelled. It was currently under review. The issue was the need for experience with DCS coring. Storms added that the drillers needed to learn how to use DCS; they could be trained on DCS IIB. The other point was hardware development. Lancelot reiterated that TEDCOM and ODP-TAMU had recommended a DCS IIB test and he would not question that. He recalled that OPCOM had considered an alternate platform for DCS testing, but that they had decided that testing must be carried out on *JOIDES Resolution*. Francis stressed the need to take a long-term view and be prepared to sacrifice near-term science for long-term science. Taira and Mutter favored a DCS IIB test. Von Rad, Tucholke, Cita-Sironi, Jenkyns, Watkins and Duncan favored a DCS IIB test on Leg 148. Natland and Malpas supported a return to Hole 504B and an engineering leg. Cowan also favored an engineering leg, but with re-examination of the entire FY93 schedule.

Malpas suggested substituting an engineering test of DCS IIB for NARM volcanic. Becker asked how soon after Leg 142 ODP-TAMU could conduct a second DCS IIB test. Austin replied that it must be on one of legs 148-150. He added that PCOM could begin consideration of the FY93 schedule again from scratch if the group felt that was warranted. However, Natland felt that NJ/MAT and NAAG were fixed. Von Rad suggested a straw vote on the importance of NARM non-volcanic. Watkins suggested a straw vote on a Leg 148 engineering test.

Malpas reiterated the importance of Hole 504B. Austin asked for PCOM input on Hole 504B. Storms stressed the importance of an early engineering test. However, if Leg 142 encountered major problems ODP-TAMU would need more time before the test. He suggested scheduling an alternate science leg as a back-up to the engineering leg. Tucholke proposed that Leg 148 be DCS IIB engineering or Hole 504B. Kidd asked whether HD was too deep for a DCS test and Francis confirmed that it was. Cowan suggested scheduling only 504B on Leg 148. In response to a question from Austin, Storms said that he did not expect a failure on Leg 142 that would be serious enough to prevent there being an engineering leg in FY93, but some time would be needed if there was a failure. Cowan revised his opinion and agreed to Leg 148 being DCS IIB engineering or Hole 504B. Taira and Jenkyns expressed their support of that plan.

Malpas and Natland voiced the concern that no high-priority LITHP objectives were being scheduled. Austin pointed out that HD was in FY93. He added that there was a wide perception of DCS as a lithosphere community tool, but he would like it to be viewed more broadly. Malpas stated that everyone agreed to deepening Hole 504B. However, he highlighted the importance of drilling the Layer 2/3 boundary, adding his concern that if it was not scheduled as Leg 148, it would not be done for some time. Other programs under discussion were Atlantic programs which could be drilled later in FY93 and FY94. In reply to a question from Von Rad, Malpas said that his personal opinion was that an early return to Hole 504B was more important than HD. Von Rad, therefore, suggested opening up Leg 147 for discussion. Austin asked for PCOM discussion of the relative merits of 504B and HD.

Lancelot preferred to keep 504B as an alternate to a Leg 148 DCS engineering test. Austin reiterated that the engineering test should be Leg 148 or Leg 149. Cita-Sironi favored postponing 504B and conducting an engineering test at MARK on Leg 148. Tucholke pointed out that the top TECP objective, NARM non-volcanic, would be omitted if Leg 149 was made an engineering leg. Taylor said that he would defer NARM non-volcanic to FY94, because NB data could then be incorporated. However, Austin cautioned that the NB survey data might not materialize if NARM non-volcanic was not scheduled. Cita-Sironi felt that it would be a terrible mistake not to schedule NARM non-volcanic. Lancelot and Austin both expressed concern about post-leg euphoria about Hole 504B unduly influencing the FY93 schedule.

Malpas agreed to Leg 148 being an engineering leg (at a location to be decided by ODP-TAMU engineers, perhaps MARK), and Leg 149 being NARM non-volcanic. A straw vote revealed a majority in favor of a Leg 148 engineering leg and a NARM non-volcanic Leg 149. Austin noted that PCOM must also decide on the composition of NARM non-volcanic, leg 1. Malpas said that he would like 504B to be a back-up to the engineering test on Leg 148 and also asked that a note be included in the minutes stating that Leg 153 would be MARK/TAG, though PCOM would not specifically schedule that leg. Austin did not object to that, but added that there were other high-priority programs (CR, etc.). Panel Chairs would encourage relevant proponents following PCOM. Lancelot supported Malpas' suggestion. Humphris added that LITHP would appreciate some indication from PCOM that Leg 153 would be either MARK or TAG.

Cowan did not favor scheduling Leg 153 just to placate the lithosphere community; Austin noted that it would limit PCOM's freedom in scheduling FY94 operations. Taira suggested leaving it as a note in the minutes and not placing it on the schedule. Austin stated that EXCOM would want to know exactly how PCOM intended to treat Leg 153 in that case. Tucholke suggested the following course of action: if Leg 148 was an engineering leg, Leg 153 would be MARK/TAG, but if Hole 504B was drilled on Leg 148, FY94 would be open (no MARK/TAG commitment). Austin restated Tucholke's suggestion: Hole 504B would be a back-up for the Leg 148 engineering test; if Leg 148 was 504B, then no FY94 leg was presently scheduled; if Leg 148 was an engineering leg, Leg 153 would be either TAG or MARK for science. Watkins was strongly opposed to formalizing Leg 153. Austin noted that the major unknown was the outcome of Leg 142 (Engineering/EPR). Kidd point out that, if Leg 153 was formalized, the outside community would be confronted with 4 lithosphere legs out of a total of 6 legs.

Austin said that he would rather leave Leg 153 more open. EAT and CR should also be in the running for Leg 153. Malpas asked whether the issue of Leg 153 could be revisited after the results of Leg 142 were known, at PCOM's April, 1992, meeting. However, Austin said that would also set a precedent. He preferred not to commit PCOM to actions it would have to take in April, 1992. The important point was to signal proponents. Mutter commented that AF should be included in any list of programs to be encouraged. In response to a question from Moores, Austin acknowledged that EAT was not packaged well for a 1-leg initial approach. Taira supported leaving FY94 open. Austin reiterated that the minutes would reflect the programs that PCOM favored.

Malpas stressed the importance of sending a message to LITHP, as TAG was its top priority program. Austin responded that PCOM could state that the top 2 priorities of each thematic panel would continue to be actively considered. Tucholke emphasized that MARK/TAG (as Leg 153) would not be in FY93 in any case. PCOM finally passed the following motion.

PCOM Motion

PCOM approves the following drilling schedule for Fiscal Year 1993 (assuming 56 day legs, 5 day port calls):

147	**Hess Deep**	**26 Nov. 1992**	**-**	**21 Jan. 1993**
148	**Engineering - DCS Phase IIB Back-up: Hole 504B**	**26 Jan. 1993**	**-**	**23 Mar. 1993**
149	**NARM non-volcanic, Leg 1**	**28 Mar. 1993**	**-**	**23 May 1993**
150	**New Jersey / Middle Atlantic Transect**	**28 May 1993**	**-**	**23 July 1993**
151	**NAAG, Leg 1**	**28 July 1993**	**-**	**22 Sept.1993**
152	**NARM volcanic, Leg 1**	**27 Sept. 1993**	**-**	**22 Nov.1993**

Motion Larson, second Watkins Vote: for 12; against 0; abstain 4; absent 1

Austin noted that PCOM still needed to decide on the strategy for NARM non-volcanic, leg 1, i.e., whether to adopt the NARM-DPG approach, or focus on a single deep hole. Lancelot and Taira proposed adopting the NARM-DPG recommendations. Cowan asked for more information on the engineering problems related to the water depth at the IAP-1 deep hole, relative to the NB-4A deep hole. Storms replied that long, multiple casing strings were needed when drilling long sediment columns. ODP did not have experience in their use and needed to learn. The problem was exacerbated in deeper water. ODP-TAMU needed to study both deep sites. Larsen reiterated that, if PCOM chose to drill a deep site on NARM non-volcanic, leg 1, NARM-DPG would prefer that NB-4A be chosen. In response to a question from Tucholke, Storms said that ODP-TAMU would ideally like to drill a minimum sediment column and maximize basement penetration, but that was not an option. Tucholke stated that ODP had drilled 2000 m at Hole 504B and a 2500 m hole was proposed at NB-4A; he asked what ODP-TAMU would like to see as an intermediate step to NB-4A. Von Rad suggested asking a subset of NARM-DPG to combine the basement objectives of IAP and GAL sites. Austin felt that had been done, but von Rad answered that a new site-survey was available. Austin responded that such a task would be done by the co-chiefs. Taylor asked whether, if NB-4A was drilled in FY94, ODP-TAMU would want to go to 504B in FY93. Storms agreed that would be the case ideally. Austin stated that one day PCOM was going to order a deep site. Storms responded that ODP-TAMU had begun a summary of NARM sites, but that there had been insufficient time to refine it. ODP-TAMU had identified 2 sites which would form a learning curve: NB-7A (4200 m water depth, 1600 m sediment, 100 m basement) and EG63-2 (1875 m water depth, 1220 m sediment, 500 m basement). This study had only just begun. ODP-TAMU was not as far along with planning for deep drilling as Storms would have liked. Austin recalled that ODP-TAMU defined deep drilling as any hole requiring ≥leg. PCOM instead defined it in terms of maximizing the capabilities of *JOIDES Resolution*. Storms said that he would examine IAP-1 and NB-4A, noting that NARM-DPG preferred to drill NB-4A first. Von Rad pointed out that 1800 m had already been drilled on a continental margin in only half a leg ~15 years ago. Austin commented that ODP-TAMU engineers had asked for time to maximize the capabilities of *JOIDES Resolution*. Storms agreed, but stressed the need to examine sites in detail before informing PCOM whether or not they could be drilled. ODP-TAMU did not have personnel available and deep drilling had not been prioritized by PCOM.

Austin felt that PCOM was constrained to follow NARM-DPG's recommendations. Deep drilling would be deferred for 1 year. The minutes would include PCOM's advice that ODP-TAMU proceed with deep drilling studies, with the realization that this involved financial issues. Mutter remarked that the whole NARM program would be thrown into question if

studies showed that deep holes could not be drilled. However, Francis responded that IAP-1 was probably drillable in fine weather. The limits of the system had not been sufficiently explored. Larsen noted that NARM-DPG had considered these issues and had based its recommendations on engineering input. It was for that reason that NARM-DPG preferred drilling NB-4A before IAP-1. Taylor explained that his concern with scheduling NARM non-volcanic was that something like 504B should be done to practice deep drilling in preparation for the highest-priority NARM non-volcanic science in FY94. He felt that the highest-priority deep site should come first. Lancelot asked whether NARM-DPG felt that focusing on the 2 deep sites would be better than transects. Larsen replied that it did not, that transects would enable determination of the most important relationships. Jenkyns endorsed following NARM-DPG's recommendations. Cita-Sironi favored drilling a deep hole first, but since NB-4A was not ready, and water depth at IAP-1 was too great, she would go along with the NARM-DPG's recommendations. Duncan agreed. PCOM passed the following motion.

PCOM Motion

PCOM moves that the NARM-DPG strategy for drilling the first non-volcanic leg be adopted.

Motion Lancelot, second Taira Vote: for 13; against 2; abstain 1; absent 1

Annual Meeting JOIDES PCOM
Saturday, December 7 1991

934. Detailed Planning Requirements - 1992 PCOM Meetings

Austin referred to the Agenda Book (blue pages 30-34) for a summary of the primary purposes of the 3 PCOM meetings in 1992.

Austin began with discussion of the April, 1992, PCOM meeting. In 1992, in contrast to previous years, thematic panels would also asses drillability. They would try to meet a little earlier than usual (probably in late February - early March). Becker asked whether an assessment of Leg 142 would be discussed in April. Austin answered that it would and that he would follow up with ODP-TAMU on engineering leg sites for FY93. Becker stressed the need to involve panels in that decision. However, Austin said that it was his understanding that it was ODP-TAMU's decision, that the DCS IIB engineering test (Leg 148) might be at MARK, or even EPR. PCOM could choose a science co-chief today and that would determine the science aspect. Natland disagreed with that approach. Taylor asked whether the guidebase used for drilling at MARK on legs 106 and 109 was still usable. Francis said that it was not. He added that ODP-TAMU could postpone appointment of a co-chief for Leg 148 until April, 1992, after results of Leg 142 were known. PCOM could provide a range of co-chiefs for different scientific objectives. Austin stated that he would like to see DCS IIB tested in an area of high scientific interest, though he acknowledged that others felt differently. Taylor pointed out that Leg 148 co-chief requirements were highly dependent on the success or failure of Leg 142. He favored waiting until April before assigning co-chief(s) for Leg 148. Lancelot asked what would happen if Leg 142 was a real failure. Francis replied that Hole 504B would be the back-up Leg 148. Lancelot asked what would be done if Leg 142 demonstrated that ridge crests cannot be drilled with DCS. Austin replied that there was no plan for that catastrophic failure. Natland said that there were 2 possible outcomes: 1) DCS IIB will not work at all, or 2) DCS will not drill those particular rocks. Austin stated that the latter would mean a push to drill other lithologies with DCS, e.g., shallow-water carbonates. He added that ODP was

developing DCS because it was a proven tool in the mining industry. Lancelot asked what the plan would be for ridge crest drilling if DCS could not drill ridge crests. Austin replied that there were currently no alternatives to DCS for ridge crest drilling.

Austin went on to discuss the summer meeting, scheduled for 11-13 August, 1992, moved because of a conflict with IGC. The 1992 summer PCOM meeting would be held in Newfoundland. Its purpose would be to prepare for the 1992 annual meeting. Reports of liaison groups would also be heard: FDSN might present a global plan. There would be a field trip to the Bay of Islands ophiolite, perhaps by helicopter.

The 1992 PCOM Annual Meeting might be in Bermuda. The JOIDES Office would try to send out the FY94 prospectus early. Thematic panels would play an integrative role in trying to present programs in leg form. In response to a question from von Rad, Austin said that the FY94 prospectus would include items from the FY93 prospectus. Mutter remarked that FY93 programs would only be included if thematic panels ranked them highly. Austin agreed, adding that the FY94 prospectus would be an "Atlantic" prospectus, including the Caribbean, Mediterranean and Gulf of Mexico. Blum asked whether, because results of global ranking would be available at the April PCOM meeting, PCOM could decide on the "Atlantic" prospectus in April. In view of the large volume of paper involved, that would give the JOIDES Office the time necessary to get it to panels early. Austin replied that the problem was that time was needed to inform proponents and get their revisions, and also to include potential new programs. However, Taylor pointed out that the Agenda Book (blue page 33) stated that the FY94 prospectus would be prepared during the spring/summer of 1992. Austin said that the panels were to try something new, i.e., PCOM will know something about proposal maturity at its April meeting.

Cita-Sironi stated that it was very important to proponents and funding agencies whether a proposal was in the prospectus or not. Von Rad suggested limiting the number of pages in the prospectus. Taylor proposed asking thematic panels to write true abstracts to be used in the prospectus instead of reproducing complete proposals. He recalled that regional panels used to do that. However, Austin replied that panels were already complaining about their workload. Larson suggested that proponents could do it. Austin responded that the JOIDES Office encouraged proponents to write abstracts, but that he did not want to discourage proponents from including data. Mutter commented that PCOM did not need the data. Cowan pointed out that thematic panels received all proposals individually and asked whether they needed to receive a duplicate set bound in a prospectus. Blum replied that panels were glad to have prospectuses, even though they already have proposals. Austin added that, as a single document, the prospectus clarified panels' tasks. The prospectus was also important for proponents. The FY93 prospectus gave proponents a deadline and encouraged many of them to submit new data. Von Rad still felt that proponents should be asked to submit a shortened version of their proposals. Austin said that the JOIDES Office would ask, but doubted that many would be received. Taylor suggested encouraging thematic panels to work with proponents to produce true prospectus versions of their proposals. Austin noted that the NAP was the result of a great effort by Blum to get information from proponents. They were given a great deal of extra time to comply, which was why the NAP was late. Austin favored paring down the size of the prospectus based on drillability assessments. Mutter felt that only the top 3 or 4 of the thematic panels' global rankings need be included in the prospectus. He noted that some NAP proposals had been crossed off immediately and unanimously by PCOM. Austin responded that PCOM had to include panel rankings fairly. He added that Panel Chairs now knew their roles better than ever.

Natland recalled that PCOM had made a commitment to return to 2 areas in the eastern Pacific (SR and EPR) as soon as those programs were technically feasible (both required the DCS). He asked when those programs would be reinserted in the prospectus. Natland also asked whether multi-leg programs from the NAP would remain in the FY94 prospectus. Austin replied that *JOIDES Resolution* would not re-enter the Pacific before April, 1994. PCOM could consider those matters at its April, 1992 meeting.

935. Membership on JOIDES Panels

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

LITHP

Phipps-Morgan was rotating off the panel and G. Smith was due to rotate off after the next meeting. LITHP would like to retain him for an additional meeting. LITHP wanted the replacement for Phipps-Morgan to be a modeler and nominated M. Parmentier, R. Buck and D. Wilson, though none have been contacted.

Duncan recommended M. Richards (UC Berkeley) to replace Phipps-Morgan. Austin stated that he was inclined to go with the panel's choices. Richards should contact Humphris and indicate his willingness to serve. He might join LITHP later. Becker questioned the balance between JOI and non-JOI institutions. Austin replied that such balance was not necessary on each panel.

Taylor asked whether there was any LIPS (Large Igneous Provinces) expertise on LITHP. Taylor said that Mahoney (Hawaii) was interested in joining. Austin said he should also contact Humphris. He added that increasing the size of LITHP was an option. Von Rad announced that P. Herzig (Germany) would join at the end of 1992. Austin stated that, if it felt LIPS needed attention, PCOM could inform Humphris that LITHP should consider nominating a LIPS specialist. Larson feared that LITHP was simply an extension of the RIDGE initiative. Crawford pointed out that a C-A meeting in March would re-evaluate all C-A panel members. Franklin might rotate off the panel. Austin asked Crawford to take the message back that a LIPS person from C-A was desirable.

TECP

Klitgord wished to be replaced. G.M. Purdy and D. Sawyer had 1 more meeting before rotating off TECP. TECP provided nominees (with rifted margins expertise) to replace Klitgord (C. Keen, C. Beaumont, M. Steckler and G. Bond). Austin pointed out that if a nominee was non-US, the relevant international partner must be prepared to pay for that person. Crawford responded that he had been informed by Malpas that C-A was prepared to pay for C. Keen. PCOM supported that choice. Nominees were also provided by TECP in 2 additional areas in which TECP sought to augment its expertise: 1) "physical mechanisms of deformation," and 2) "collision—small ocean basins". Austin noted that TECP was already a large panel and he was reluctant to increase its size. He stated that PCOM could delay action until after the spring meeting, when Purdy and Sawyer would have rotated off the panel, but that would mean TECP would not have the desired expertise at their spring meeting.

Mutter and Taylor thought that TECP should be made to replace an additional member before getting the additional expertise. Mutter felt that TECP already had sufficient expertise in collision—small ocean basins. Austin noted that Sawyer's rotation would be less of a problem if Keen were to join. However, Blum noted that neither Purdy nor Sawyer had had their full term and should not be forced off the panel. Taylor, therefore, proposed delaying the provision of new expertise. Austin stated that PCOM would not take immediate action, but was sympathetic to a physical mechanisms of deformation person being added after the next TECP meeting. TECP did not seem to need additional expertise in collision—small ocean basins. Austin noted that 14-16 was a natural limit to panel size.

OHP

N. Shackleton (chairperson) was rotating off OHP and would not attend its next meeting. M. Delaney would replace Shackleton as chairperson; Austin considered her an excellent choice. Shackleton would be replaced as UK member by P. Weaver. W. Berggren and A. Mix were also rotating off OHP. Raymo (UC Berkeley) was nominated to replace Mix. For Berggren's replacement, 3 nominees were provided: D. Hodell (U. Florida), J. Kennett (UC Santa Barbara), Zachos (Michigan).

Austin favored young replacements, but Duncan recalled Shackleton's concern about OHP losing its older and more experienced members. Becker noted that if Hodell were to join, OHP would have 2 members from U. Florida. Therefore, PCOM accepted Raymo as Mix's replacement, and Zachos for Berggren. PCOM also reached the following consensus.

PCOM Consensus

PCOM thanks Nick Shackleton, who is leaving the chairmanship of the prestigious Ocean History thematic panel of ODP, for his long-lasting, inspiring, perseverant leadership.

SGPP

E. Suess (at-large), F. Prahl and S. Dreiss had rotated off SGPP. SGPP requested that Christie-Blick remain on the panel until the end of 1992. SGPP had dropped its original request for organic geochemistry nominees, because this expertise would be provided by new German and UK replacements (K. Emeis and P. Farrimond, respectively). SGPP favored C. Paull (UNC) or P. Vrolijk (EXXON) as replacements for Prahl. A hydrogeologist was essential as replacement for Dreiss. SGPP nominated J.M. Bahr (Wisconsin/Madison), C. Forster (Utah) and S. Rojstaczer (Duke). PCOM accepted Paull, for his gas hydrates expertise, and Bahr.

Von Rad suggested that a sedimentologist replacement be found for the Japanese member, M. Ito, who could rotate in 1992 to augment sedimentological membership of SGPP. Jenkyns noted that H. Elderfield (at-large) had been on SGPP for a long time, but that the UK was prepared to support him for a further year. McKenzie wanted that.

DMP

D. Karig had rotated off DMP. R. Wilkens would rotate off after the January, 1992, meeting. PCOM accepted DMP's nomination of S. Hickman (USGS) to replace Karig (*in-situ* stress expertise). DMP was seeking a replacement for Wilkens, someone with sea-going experience as logging scientist on *JOIDES Resolution*.

IHP

No action required.

PPSP

No action required.

SMP

A. Richards (ESF) and R. Whitmarsh (UK) were due to rotate off following the spring, 1992, meeting. SMP requested an additional member with sedimentological expertise. Von Rad noted that SMP had no German member. He could try to find a German sedimentologist. Larson asked about the availability of physical properties expertise. Austin replied that Moran and the new UK representative, who was likely to be Lovell, covered that area. However, Mutter felt that a better UK replacement for Whitmarsh would be L. Parsons, who had underway geophysics expertise. Francis commented that Lovell would bring expertise useful for core-log integration. Larson agreed with Mutter on the need to improve underway geophysics on *JOIDES Resolution*. Austin stated that PCOM would recommend that Parsons be the UK replacement for Whitmarsh. Jenkyns responded that he could not guarantee that. Duncan pointed out that 2 paleomagnetists would be rotating shortly; 1 of them could be replaced with an underway geophysics person, if necessary. Austin stated that he could ask Moran to consider the expertise of Whitmarsh's replacement.

SSP

S. Lewis and H. Meyer (Germany—replaced by K. Hinz) had rotated off SSP. R. Kidd would retire as Panel Chair after the fall, 1992, meeting. Discussion of his replacement has been deferred to the spring, 1992, meeting. SSP nominations for Lewis' replacement were G. Mountain (LDGO) and M. Coffin (UTIG). Becker noted that Mountain's appointment would result in 2 members from LDGO. However, Austin pointed that Kastens (LDGO) would rotate off SSP at the end of 1992. Mountain and Kastens would overlap by only 1 or 2 meetings. PCOM accepted Mountain. Mutter suggested Coffin as an underway geophysics person for SMP.

Austin stated that SSP wanted to institute a 4-year membership rotation, rather than a 3-year rotation. He added that the 3-year rotation requirement had always been firmer for thematic panels than for service panels. Taylor agreed, but said that it should not apply to Kastens to avoid extending the overlap with Mountain. PCOM had no argument with that perspective.

TEDCOM

TEDCOM was planning to seek 1 or 2 new US members. Austin reported a growing sentiment within TEDCOM to do more work between meetings and that Sparks had been sympathetic.

936. Other Personnel Actions

CO-CHIEF SCIENTIST NOMINATIONS

PCOM recommended co-chief scientists for the following drilling legs. All recommendations are listed in alphabetical order. No order of preference is implied.

Leg 147, Hess Deep

US: S. Bloomer (Boston U.), H. Dick (WHOI), K. Gillis (WHOI)

International: L. Demetriev (USSR), J. Francheteau (F), J. Malpas (C-A), S. Maruyama (J), C. Mevel (F)

Austin stressed that, though Malpas would have rotated off PCOM before Leg 147, PCOM must be aware of possible conflict of interest. Lancelot recommended against considering too wide a list. Selecting proponents was of utmost importance. He felt that there was flexibility in the MOUs concerning international balance. Austin, Natland and Larson stressed the importance of including a proponent as co-chief, Larson citing the meagre site-survey data.

Leg 148, Engineering or Hole 504B

Co-chief nomination deferred until results of Leg 142 (Engineering, EPR) are known. Becker noted that nominations would be required for several cases, e.g., MARK or TAG (depending on the location chosen for the engineering leg), or Hole 504B.

Leg 149, NARM non-volcanic

US: D. Sawyer (Rice)

International: G. Boillot (F), C. Keen (C-A), B. Whitmarsh (UK)

Lancelot felt that a combination of a geophysicist and a tectonics specialist would be ideal.

Leg 150, New Jersey / Middle Atlantic Transect

US: T. Loutit (EXXON), K. Miller (Rutgers), T. Moore (Michigan), G. Mountain (LDGO)

International: M.-P. Aubry (F), C. Ravenne (F), J. van Hinte (ESF)

Austin emphasized the need for geophysical and sedimentological expertise among the co-chiefs. Von Rad suggested waiting for thematic panel nominees, but Francis responded that ODP-TAMU would have to move immediately on co-chief selection for legs up to, and including, Leg 150. Austin stated that PCOM could defer co-chief nominations on subsequent legs until thematic panels had a chance to consider the issue.

PANEL LIAISONS

Austin stressed the need for PCOM liaisons, adding that there had been problems recently.

B. Lewis was replacing Cowan and would assume Cowan's liaison duties with DMP. Lewis would attend the January, 1992, DMP meeting in Hawaii.

Cita-Sironi would attend the next SGPP meeting, but that would be her last.

Duncan would continue as US liaison to OHP. Jenkyns would be liaison to the fall, 1992, OHP meeting in Europe, but the 1992 PCOM Annual Meeting would be Jenkyns' last.

Lancelot requested a US co-liaison to IHP. Austin stated that W. Berger, the SIO PCOM replacement for Natland, would serve in that capacity.

Leinen was being replaced on PCOM by J. Fox, with Larson as alternate. Fox would replace Leinen as liaison to SMP, with Larson to attend SMP meetings if Fox was unable to attend.

Malpas would remain on PCOM for 2 more meetings; he could remain as liaison to LITHP.

Taylor (OD-WG liaison) noted that OD-WG would meet twice in spring, 1992, and he did not, therefore, wish to commit yet to further liaison duties. However, he added that he would like to be liaison to TECP when Tucholke rotated off PCOM.

Austin stated that he would attend TEDCOM's next meeting to replace Natland, who was leaving PCOM. Becker said that he could also attend if necessary.

Taira said that he would be unable to attend TECP's March, 1992, meeting. Tucholke responded that he could attend.

Von Rad would attend the September, 1992, SGPP meeting in Kiel.

Watkins would continue as SSP liaison. Austin noted that SSP would be taking an active role in upcoming programs.

DPG/WG liaisons remained unchanged (Taylor to OD-WG; Watkins to SL-WG).

PCOM Motion

PCOM endorses all personnel actions taken at the 1991 Annual Meeting.
Motion Tucholke, second Natland Vote: for 15; against 0; abstain 0; absent 2

937. Status of Detailed Planning Groups and Working Groups

NARM-DPG

Natland thought that there would be a need to reconsider the long-term drilling plan after the first 2 NARM legs. However, Mutter felt that NARM-DPG had done its job. Austin pointed out that financial constraints mitigated against keeping DPGs standing. PCOM would consider future options as needs arose. Von Rad pointed out that it was easier for international scientists to get funding while a DPG was in existence; Jenkyns echoed that. Austin remained reluctant to empower a regional DPG as a panel. Von Rad suggested getting only 4-5 DPG members together to refine plans. However, Mutter said that the co-chiefs could do that. PCOM reached the following consensus.

PCOM Consensus

PCOM thanks the North Atlantic Rifted Margins Detailed Planning Group (NARM-DPG) for its expeditious and informative report. PCOM considers NARM-DPG to have fulfilled its charge and accordingly disbands NARM-DPG.

SL-WG

SL-WG would meet again in June, 1992, for the third and last time. No further action required.

OD-WG

Austin reported that OD-WG had met once. LITHP and TECP would like OD-WG to prioritize sites and become a DPG. F. Vine, OD-WG chairperson, had asked PCOM for input. Austin recalled the original mandate of OD-WG.

"PCOM establishes an Offset Drilling Working Group (OD-WG) to be charged with:
a) establishing and setting into priority scientific objectives and a drilling strategy of a program for drilling offset sections of oceanic crust and upper mantle;
b) identifying target areas where specific objectives can be addressed;
c) identifying other survey information necessary to establish the geologic context of an offset drilling program; and
d) identifying the technological requirements to implement the strategy."

PCOM Motion, April, 1991

Natland felt that there was no immediate urgency to have OD-WG prioritize sites, since offset drilling programs had not been scheduled in FY93. Austin stressed the importance of OD-WG producing a white paper involving strategy. He did not wish to make changes which might mitigate against that. However, Mutter thought that the existence of a group of North Atlantic offset drilling proposals required a DPG. Natland disagreed, noting that there were global alternatives. Austin did not wish OD-WG to limit its discussion to the Atlantic.

Taylor felt that the issue was only one of terminology and Lancelot supported modifying OD-WG's mandate to allow discussion of North Atlantic sites. Taylor suggested that OD-WG maintain a global perspective, but that it might consider spending time in addition on Atlantic proposals. He added that OD-WG would need the membership to accomplish that task. Austin was reluctant to make OD-WG a proponent group. Tucholke suggested keeping the membership of OD-WG unchanged and changing its charge to that of a DPG after its next meeting. Austin said that he did not mind changing OD-WG's membership, but did not want to slant it toward the North Atlantic. Natland agreed, adding that that would subvert OD-WG's global objectives. Blum pointed out that a new proposal had been received, but not yet ranked. The setting up of a DPG was premature, since that proposal would not be sent to such a DPG. Austin added that PCOM would have to decide which proposals to forward to a DPG. Taylor responded that there were several Atlantic proposals, but only 2 from elsewhere (HD and Hole 735B) and these had already been identified.

Natland pointed out that E. Bonatti would represent ESF at OD-WG's next meeting. He was a Vema proponent; allowing OD-WG to become a DPG would mean entitling proponents. Austin agreed, reiterating that OD-WG's thrust should remain global, at least for one more meeting. Mutter felt that the situation was similar to that before NARM-DPG was set up, but Austin disagreed. Austin explained that a large number of very highly-ranked NARM proposals existed when NARM-DPG was established. He added that LITHP and TECP had originally wanted a WG on offset drilling because they felt that a strategy was lacking. They later wanted a DPG when some offset drilling proposals were included in the NAP. However, those proposals were placed in the NAP by PCOM; the proposals were hastily-written in response to OD-WG's existence. Taylor concurred that it might be best to leave OD-WG's mandate unchanged. He added that many members did not attend the first meeting, so that there would be a need to review with them global matters discussed at the first OD-WG meeting. Austin stated that Humphris and Moores now felt less strongly about the need for a DPG.

Becker stressed that OD-WG or the thematic panels should discuss the location of Leg 148 engineering operations before the April, 1992, PCOM meeting. Taylor stated that E. Pollard was an excellent ODP-TAMU liaison to OD-WG and he hoped that Pollard could continue to attend. Francis responded that Pollard would attend if possible. Austin agreed with Becker's statement and stated that PCOM should ask thematic panels and OD-WG what might be done at candidate sites for engineering Leg 148.

Taylor suggested that J. Karson be made a member of OD-WG. Austin responded that Karson would attend both upcoming meetings as TECP's liaison and that Moores would also attend.

Austin said that PCOM would address OHP's recommendation for a NAAG II -DPG at a later date.

Austin noted that Natland was leaving SIO for Miami and would become Becker's alternate on PCOM. Cowan was also leaving PCOM to be replaced by B. Lewis. PCOM thanked both Natland and Cowan for their work on PCOM. Leinen had already rotated off PCOM. As Dean

of the Graduate School of Oceanography, she would be joining EXCOM. Austin had already thanked Leinen.

938. Future Meetings

The 1992 Spring PCOM meeting will be hosted by R. Duncan at Oregon State University, College of Oceanography, from 21-23 April 1992. A one-day field trip by bus will be held on Monday 20 April, preceding the meeting, in the Coast Ranges (in all weathers). Attendees can fly to either Eugene or Portland and arrangements will be made through Allison Burns at JOI, Inc. to collect people at airports.

The 1992 Summer PCOM meeting will be hosted by J. Malpas in Cornerbrook, Newfoundland, Canada, on 11-13 August, 1992. A 2-day field trip will follow the meeting on August 14-15, 1992. The cost of the field trip may be $75-$100/participant, if a helicopter is used.

The 1992 PCOM Annual Meeting could be held at the Bermuda Biological Station (BBS). A cost of $120/day would include accommodation and meals. Austin (the JOIDES Office) would host the meeting if PCOM was agreeable. The University of Miami, Rosenstiel School of Marine and Atmospheric Sciences, which was to have hosted the Annual Meeting, would host a subsequent meeting in Miami. Austin pointed out that PCOM usually met during the week preceding AGU (AGU will be held on 7-11 December, 1992). Therefore PANCHM could meet on Tuesday, 1 December, 1992, with PCOM meeting on 2-5 December 1992. A field trip was to be arranged. A deposit of $100 each would be required by BBS 4 months in advance of the meeting. In response to a question from Austin, Pyle said that JOI, Inc. had no problem with BBS as a venue. Austin noted that it set a precedent of having PCOM meet at a non-JOI institution and in a country that was not an international partner. Becker said the the University of Miami could still host the Annual Meeting, if the BBS option did not work out.

The 1993 Spring PCOM meeting will be hosted by J. Mutter at Columbia University, Lamont-Doherty Geological Observatory on 26-28 April, 1993.

The 1993 Summer PCOM meeting will probably meet in Australia in the second or third week of August, 1993. Crawford explained that the ODP Secretariat at the University of Tasmania would be moving within a couple of months either to Sydney or to the University of New England. Either would probably be glad to host the meeting. Austin asked Crawford to firm up the arrangements.

939. Other Business

FORMATION OF A "STEERING GROUP" ON *IN-SITU* FLUID SAMPLING

Austin noted that DMP had recommended formation of a "steering group" to monitor implementation of the "Report of the JOIDES Working Group on *In-Situ* Pore Fluid Sampling". Austin recalled the Worthington had stated that the steering group could possibly meet in association with regular DMP meetings, but did not wish to be held to that schedule. The steering group would meet 3 times: meeting 1, generation of RFP; meeting 2, review proposals; meeting 3, recommend course of action. SGPP had endorsed the plan. OPCOM funds (if available) would be used for the steering group.

Austin stated that he was in favor of the steering group, but would prefer it to be linked to DMP, rather than be a separate entity. DMP had listed 7 appropriate members. Worthington

would chair the meeting and there would be additional liaisons. Austin proposed letting the first meeting go ahead in association with the January, 1992, DMP meeting and evaluating progress following that. Becker noted that most of the proposed members would be at that meeting already, but that an ODP-TAMU engineer was essential. Austin agreed. Francis also felt that an engineer was required and said that ODP-TAMU would do its best to comply. He asked whether the steering group required OPCOM funds. Austin responded that if the steering group was tacked onto the DMP meeting, the cost would be small. However, the expense of disseminating the RFP and further action would require additional funds. If OPCOM funds failed to materialize, progress might be stalled. Pyle commented that some SOE money was available and, depending on its cost, the steering group might be able to function without OPCOM funds. PCOM passed the following motion.

PCOM Motion

PCOM authorizes the formation of a steering group for *in-situ* fluid sampling, to be constituted as a subset of DMP effective at its January, 1992, meeting. PCOM approves the mandate and membership of the group as described in DMP recommendation 91/17, and urges that it meet in conjunction with normally-scheduled DMP meetings.
Motion Becker, second Lancelot Vote: for 16; against 0; abstain 0; absent 1

FORMATION OF A WG TO REVIEW ALL ODP HARDWARE / SOFTWARE SYSTEMS

Austin stated that IHP had suggested holding a workshop to review all ODP hardware and software systems. He informed PCOM that Gibson, IHP chair, had proposed a 1.5-day meeting to be held in early March, 1992, in eastern North America. The workshop would advise on: 1) a new database structure for ODP to cope with the its rapidly-expanding needs, and particularly to facilitate core/log integration, and 2) an appropriate hardware and software computing environment for ODP in the 1990's, compatible with 1). (For further notes about the meeting and suggested participants, see Appendix 17 [Appendix 17 includes a suggested PCOM motion written by IHP]).

Austin explained that funding was the issue: no funds in support of workshops were available from commingled funds. Funds could be found if it was set up as a WG instead, especially since it would only meet once. However, in that case, PCOM would have to define its mandate. Larson felt that the meeting was necessary. Lancelot noted that a large group was proposed and that it was more like a workshop. Larson suggested reducing the list. Austin said that PCOM could review results of the internal ODP-TAMU meeting on the status of computing within ODP (scheduled for January 24, 1992, at ODP-TAMU) before proceeding. However, Larson felt it important to proceed immediately. Lancelot stated that IHP wanted the group to review data handling on board *JOIDES Resolution* and also how data were disseminated to the community for use. The system should be rebuilt so that the whole was a single system. Participation of experts would be required.

In response to a question from Larson, Francis said that the internal ODP-TAMU study was in response to Leg 138-related criticisms of the computer system. Larson encouraged ODP-TAMU to include the management structure in addition to computer systems. Austin stated that the WG would include management issues. Crawford reported that Gibson had suggested the appointment of a computer manager at ODP-TAMU at the same level as the manager of science operations. Based on suggestions from PCOM Austin named the WG the Data-Handling Working Group (DH-WG). PCOM wrote the following mandate for DH-WG.

PCOM Consensus

Data-Handling Working Group Mandate

PCOM endorses a 1.5-day Data-Handling Working group to meet in eastern North America in early March, 1992, and advise PCOM on:
1) a new database structure for ODP to cope with the rapidly-expanding needs of the project, and particularly to facilitate core/log data integration;
2) an appropriate hardware/software environment for ODP in the 1990's, compatible with 1).
A written report will be prepared and ready for PCOM review at its April, 1992, meeting.

Austin went on to discuss DH-WG membership. He noted that WG membership was usually limited to 16-20 persons. Based on IHP's requested participation (Appendix 17), PCOM drew up the following list of categories of participants. Numbers in parentheses are the approximate number of persons that might attend from each category.

1) Data-handling specialists from each JOI institution, including those with recent shipboard experience. (10)
2) Representatives from international partners, including those with recent shipboard experience. (7)
3) Chairpersons of SMP and DMP or their representatives. (2)
4) ODP-LDGO representative. (1)
5) PCOM representative (probably Lancelot). (1)
6) Invited representatives from ODP-TAMU. (2)

This would yield a total participation of 23. Austin suggested limiting the number to 20. Lancelot stressed the need to make sure that the DH-WG obtained the best possible people in categories 1) and 2). Francis highlighted the need to include people with recent experience aboard *JOIDES Resolution*. Taylor felt that there should be representatives from NGDC. Austin pointed out that Gibson was aware of that, since IHP included NGDC representatives. Francis felt that >2 people from ODP-TAMU would be needed and that ~half of the participants must have had recent experience of the system. In response to a question from Mutter, Austin said that Gibson would submit a list of names of DH-WG members. In addition, PCOM members could recommend individuals directly to Gibson. Austin must receive a list of attendees from Gibson before authorizing the meeting. DH-WG will report by the April, 1992, PCOM meeting.

ADVICE ON EQUIPMENT PURCHASES

Austin reported that Pyle had requested PCOM advice on equipment purchases. Pyle stated that: 1) equipment purchases should be endorsed by PCOM, and 2) if the list of items was long, it should be in order of priority. Pyle explained that prioritization was required, because extra money was sometimes left at the end of the FY and a decision about what to buy must be made.

Austin stated that panels would provide a joint short-list of prioritized equipment for purchase. Francis suggested that the subject also be discussed at the co-chiefs' meeting. Austin had no objection.

FOUR-YEAR SCIENCE PLAN

Austin informed PCOM that he would be writing a 4-year (FY93-96) science plan. This would comprise a detailed plan for FY93, with less-firm plans for three years beyond that. He did not intend to consider programs ranked below 5 in the April, 1991, thematic panel rankings. He would also address OPCOM issues, even though status of OPCOM funds remained uncertain. The 4-year science plan was a proposal that would be reviewed by NSB. Austin asked for input from PCOM, noting that he would either like someone to volunteer to write the 4-year plan, or alternatively have it left entirely to him. There were no objections to Austin writing the 4-year plan.

UPDATE ON LEG 141 (CTJ)

Francis reported that the the latest news from *JOIDES Resolution* was that logging was underway at Site SC-3. The hole had been stopped at 476 mbsf, as there had not been time to reach basement. No hydrates had been recovered, though a BSR was present. However, there was chemical evidence of hydrates and it should be possible to log that zone. There had been some anxiety about hydrocarbons. Very stiff clays had resulted in slow penetration. A temperature inversion was encountered.

WEST PACIFIC REVIEW SYMPOSIUM

Taylor stated that he had been asked by PCOM to consider organizing a West Pacific review symposium. This would be discussed at AGU during the week following PCOM. The tentative plan was that the symposium would take place in October, 1992, in the San Francisco area. Taylor said that he would try to write a letter in January and also write a proposal to JOI/USSAC. In response to a question from von Rad, Taylor said that he would invite co-chiefs and former WPAC members.

940. Adjournment

Von Rad thanked Austin and UTIG for hosting the 1991 PCOM Annual Meeting.

The meeting was adjourned at 12:10 PM.

APPENDICES ATTACHED TO THE 4-7 DECEMBER, 1991 PCOM ANNUAL MEETING

1. JOI, Inc. report, supplemental information
2. Science Operator report, supplemental information
3. Wireline Logging report, supplemental information
4. DMP report, supplemental information
5. SMP report, supplemental information
6. SSP report, supplemental information
7. TEDCOM report, supplemental information
8. Leg 140 scientific report, supplemental information
9. PANCHM minutes
10. LITHP annual report

11. TECP report, supplemental information
12. NARM-DPG, supplemental information
13. Science Operator engineering report, supplemental information
14. Science Operator report on sea-ice conditions for NAAG drilling, supplemental information
15. Wireline Logging engineering report, supplemental information
16. MS watchdog report, supplemental information
17. IHP proposal for Data Handling Working Group

HANDOUTS DISTRIBUTED AT THE 4-7 DECEMBER, 1991 PCOM ANNUAL MEETING

1. NSF report, supplemental information
2. PANCHM minutes
3. SGPP minutes
4. Draft SMP Special Core Disturbance Meeting Report, 18 October, 1991
5. Telex from A. Sharaskin to J. Austin re: input to PCOM Annual Meeting *in absentia*
6. Letter from B. Carson and G. Westbrook to J. Austin re: fluid sampling on Leg 146
7. Letter from B. Larsen to R. Kidd re: site survey assessment of Leg 145
8. Letter from E. Jansen to J. Austin re: site surveys for NAAG drilling
9. Program of IGC-ODP Symposium (August, 1992), conveners J. Austin and A. Taira
10. I. Dalziel, 1992, Antarctica; a tale of two supercontinents? *Ann. Rev. Earth & Planet. Sci.* (preprint)
11. Rolling over the Ocean, *The Economist*, November 16, 1991.

PCOM - Dec. 1991

- FY91 WRAP-UP
  - ADD'L. FUNDS FROM U.S./NSF (+ $167K)
  - NO IMPACT ON OPERATIONS
  - FUEL FUND: $1.17M REMAINS → FY92

FLASH: BCOM APPROVES OPCOM #

- FY92
  - NO SPECIAL PROBLEMS SEEN
- HIGH TEMP. TOOLS
  - PROPOSED JOINT FUNDING WITH DOE
    - DOE FUNDS SLIMLINE, NIGHT DOWNHOLE WATER SAMPLER
    - ODP ADVISES ON CONSTRUCTION; DEVELOPS "UPHOLE" DECK & LAB EQPT.
    - AD-HOC GEOCHEM. ADVISORY GROUP (J. EDMOND, CHAIR) MEETS AT AGU
      - ADD'L. MEMBERS FR. NON-U.S.?
- DCS REVIEW
  - PHASE IIB - MORE EXPERIENCE (142 + ?)
  - PHASE III - VITAL; CONTINUE DESIGN; DEFER CONSTRUCTION
- FY93-96 PROGRAM PLAN
  - SEE SCHEDULE

DRAFT

CALENDAR FOR FY93 - 96
PROGRAM PLAN DEVELOPMENT

Present	NSF budget target known to JOI (LRP numbers)
Jan. 2	FY93 part of Science Plan from JOIDES Office to JOI and subcontractors
Jan. ___	FY94 - 96 part of Science Plan from JOIDES Office to JOI and subcontractors
Jan. 7	FY93 - 96 "Budget Outline" from subcontractors to JOI
Jan. 8	"Budget Outline" faxed by JOI to BCOM members
Jan. 16 (p.m.) - 17	BCOM meeting in Bonn (after EXCOM & JOI BOG)
Jan. 27	Drafts of Program Plan due at JOI from subcontractors
Feb. 10	Draft of Program Plan due at NSF for Administrative Review
Feb. 14	Response from NSF to JOI
Mar. 16	Final Draft of Program Plan to NSF
April - May	NSF Panel Review of Program Plan
June 1	Final Draft of Program Plan express mailed to EXCOM
June 16 - 18	EXCOM considers Program Plan
July - Aug.	National Science Board Review of Program Plan

- ALTERNATE PLATFORMS
  - STUDY OKAYED
  - AWAITING PROPOSAL
- EQPT. PURCHASES
  - NEED PCOM COORDINATION/PRIORITIZING OF PANEL RECS.
- PANEL CHAIRS & MINUTES
  - SEE INVENTORY
- REVIEW INTL. PURCHASES/PERSONNEL
- RENEWAL ISSUES

JOIDES Panel Minutes
Submissions to the JOI Office
FY'91

Panel	Minutes Received	Minutes Missing
DMP	Oct '91, June '91, February '91	*None*
IHP	March '91	September '91
LITHP	October '91	March '91
OHP	October '91, February '91	*None*
PPSP	.....	May '91
SGPP	.....	March '91; last rec'd July '89
SMP	March '91, November '90	October '91
SSP	October '91, March '91	*None*
TECP	October '91, March '91	*None*
TEDCOM	October '91	July '91
DPG's & WG's		
NARM	.....	August '91 & February '91
SL-WG	March '91	November '91
OD-WG	.....	August '91
NA-AG	February '91	

LEG 139

GENERAL CONCLUSIONS

* ODP CAN SUCCESSFULLY OPERATE IN HYDROTHERMAL ENVIRONMENTS IN THESE WATER DEPTHS WITH PRESENT APC/XCB/RCB TECHNOLOGY.

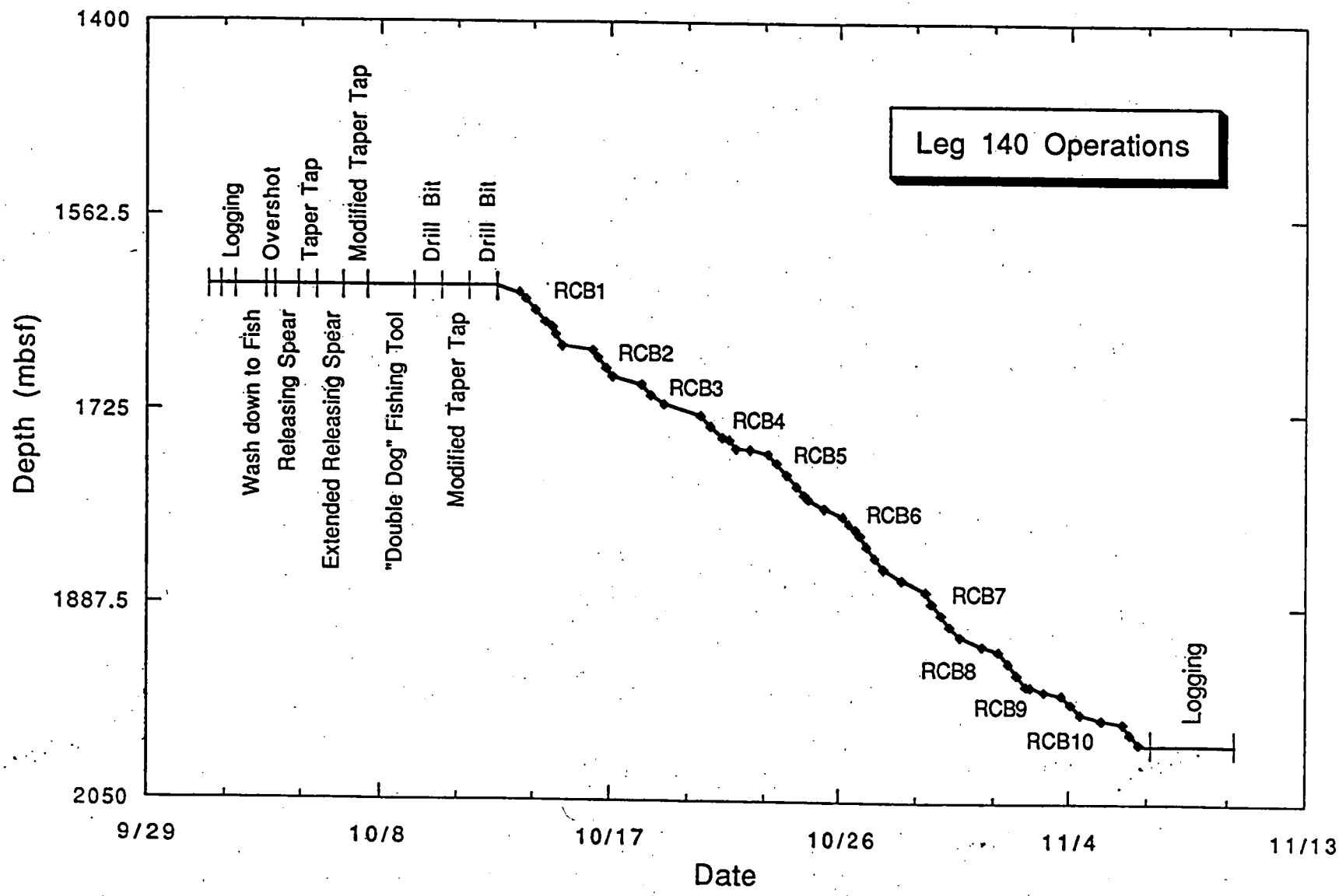
* MAINTAINING CIRCULATION VERY SUCCESSFUL IN COOLING HOLES AND BHA
  - BUTYRATE LINERS USED MOST OF THE TIME
  - CONVENTIONAL SEALS IN CORING TOOLS
  - HIGH TEMPERATURE DRILL BITS NOT REQUIRED

* NO SERIOUS SAFETY PROBLEMS ENCOUNTERED
  - ONLY 2 MINOR H_2S ALERTS
  - NO WELL CONTROL PROBLEMS

* H_2S SAFETY PRECAUTIONS MORE THAN ADEQUATE

* CORE RECOVERY OF INDURATED MATERIAL LOW. EFFECT OF THERMAL SHOCK?

* 160 M MASSIVE SULPHIDES CORED, BUT CLEANING OF XCB/RCB HOLES VERY DIFFICULT


Leg 140 Operations
Depth (mbsf)
1400
1562.5
1725
1887.5
2050
9/29
10/8
10/17
10/26
11/4
11/13
Date
Logging
Overshot
Taper Tap
Modified Taper Tap
Drill Bit
Drill Bit
Wash down to Fish
Releasing Spear
Extended Releasing Spear
"Double Dog" Fishing Tool
Modified Taper Tap
RCB1
RCB2
RCB3
RCB4
RCB5
RCB6
RCB7
RCB8
RCB9
RCB10
Logging

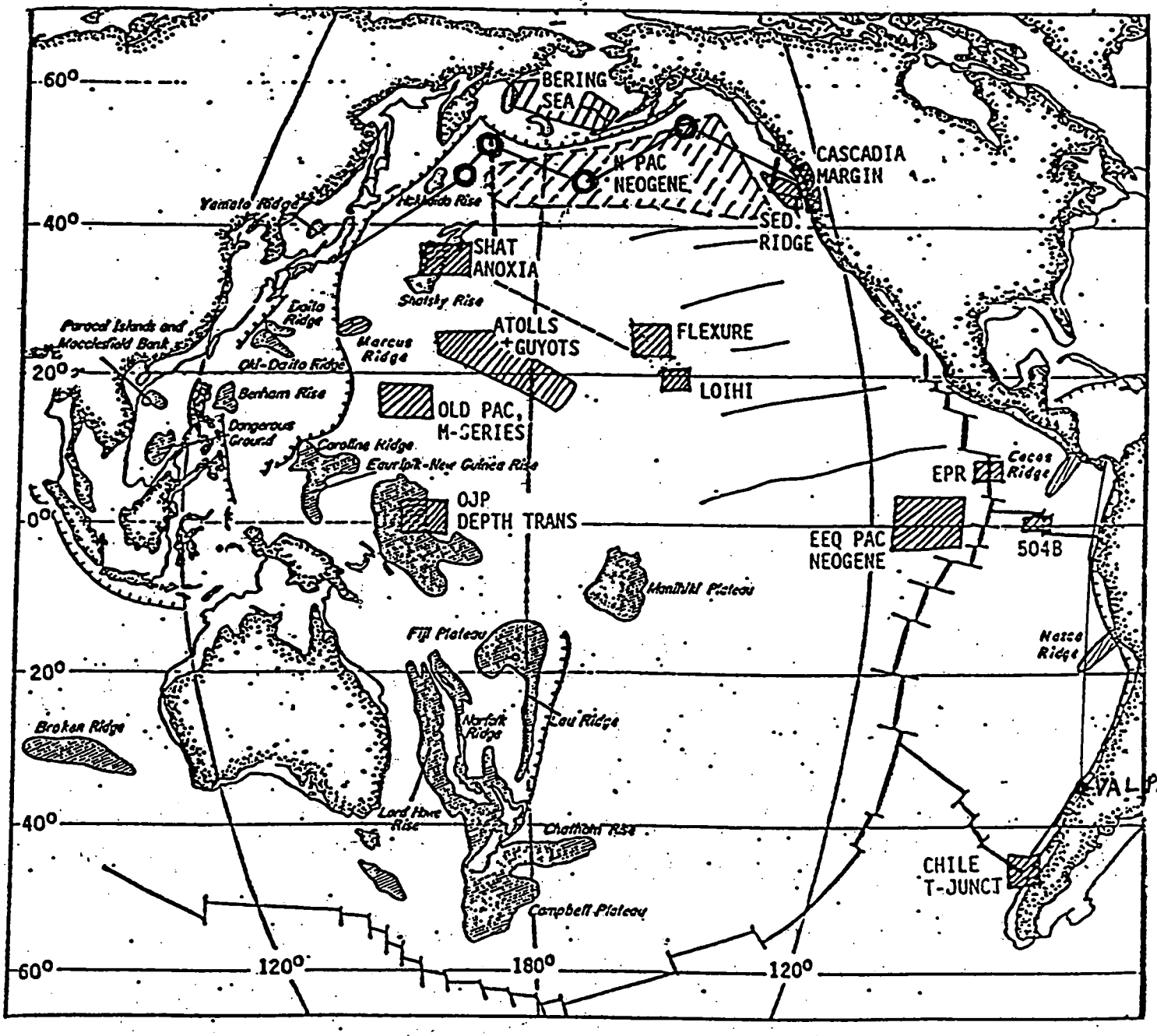
HOLE 504B STATISTICS

LEG 140	TRANSIT	18 DAYS
	CORING	25-1/2
	FISHING/HOLE CLEANING	10
	LOGGING	4

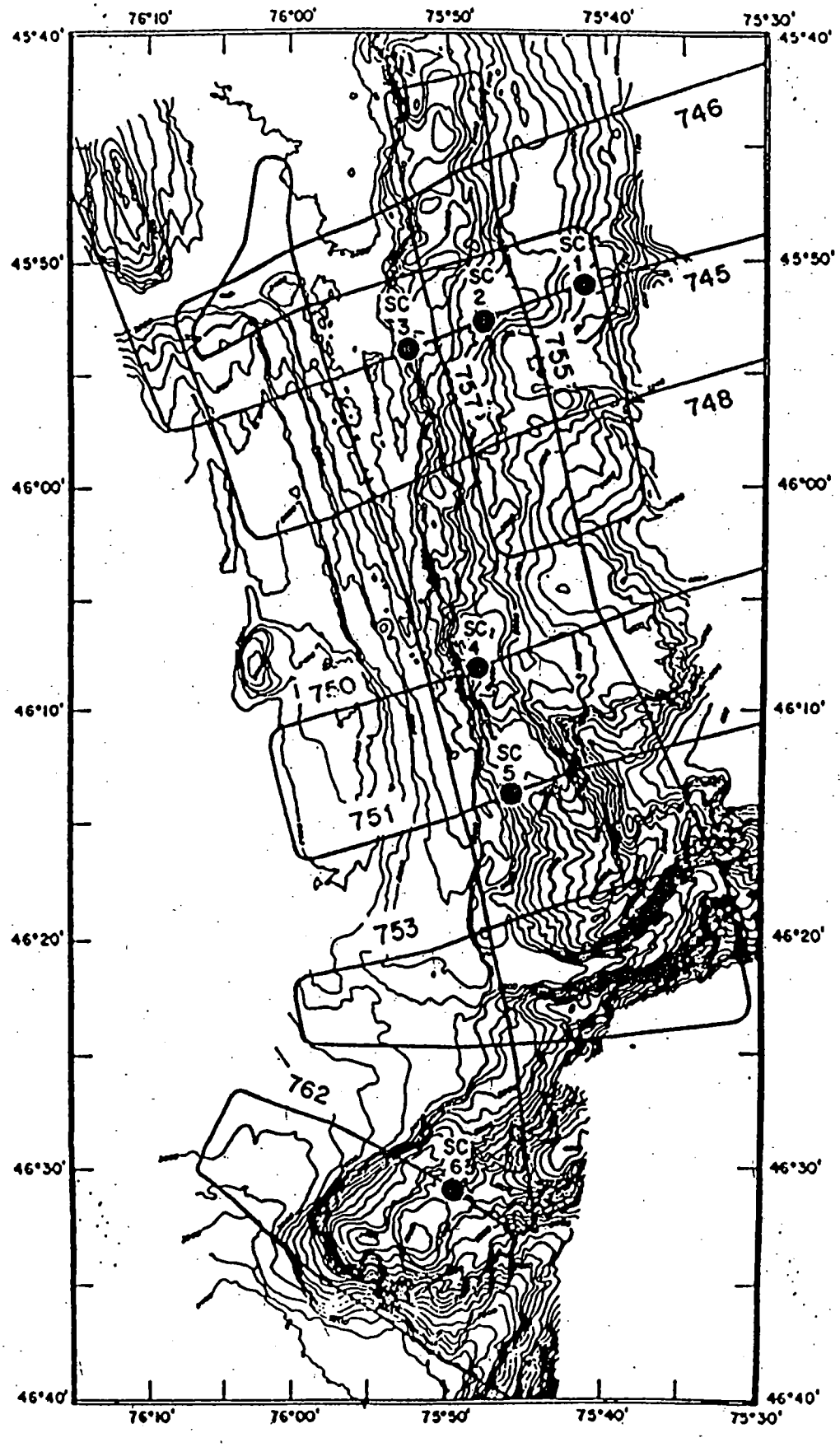
DEPTH OF HOLE AT END OF LEG	2000.4 M
PENETRATION	378.9 M
CORE RECOVERED	47.69 M
% RECOVERY	12.6
AVERAGE RATE OF PENETRATION (including wireline, trip time)	15 M/DAY

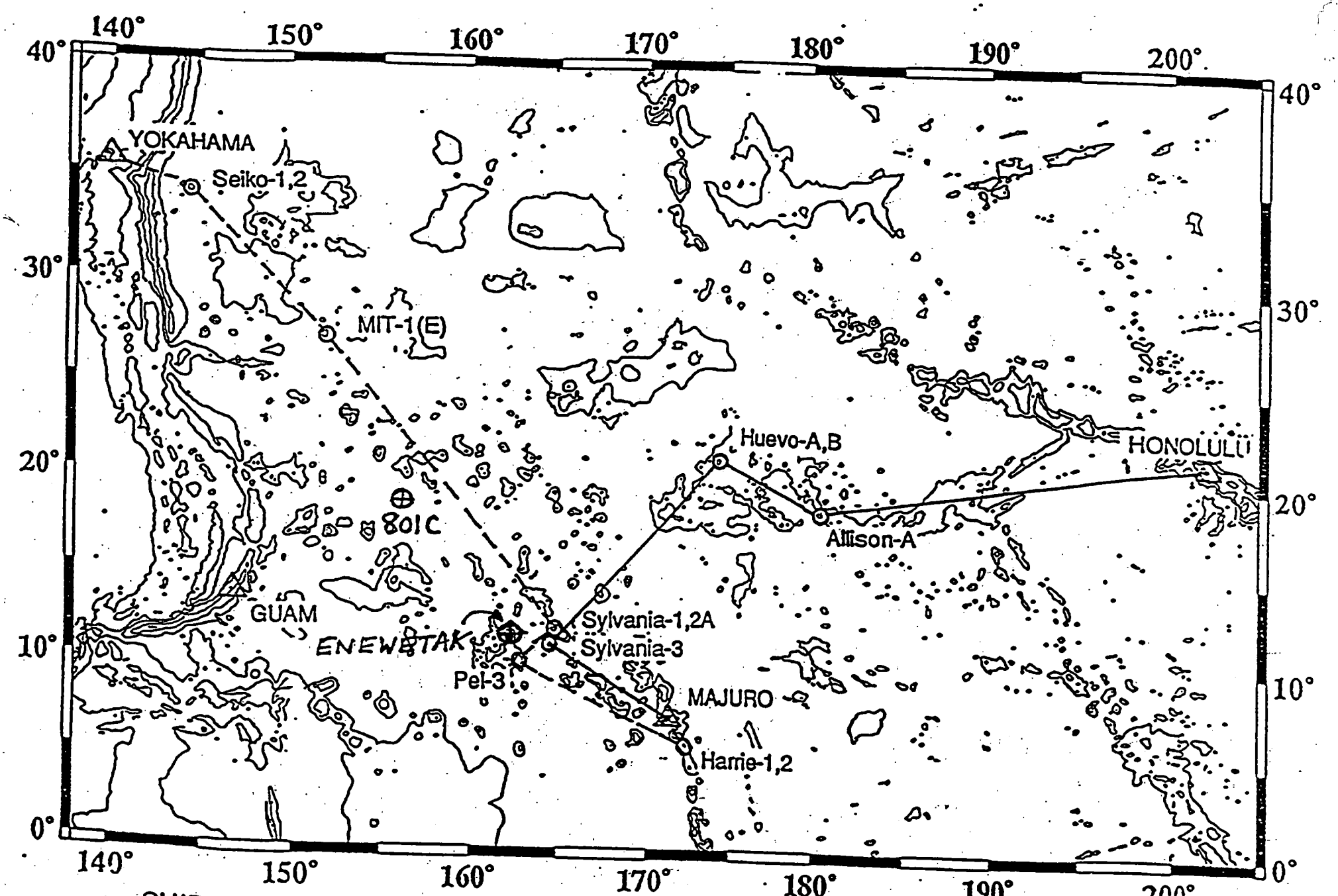
ALL LEGS (69 THROUGH 140)

TOTAL TIME ON HOLE	180.4 DAYS ~6 MONTHS
TIME FISHING/HOLE CLEANING	37.5 DAYS 20.8% OF TOTAL



Drilling locations of programs in the CEPAC Prospectus.


76°10'
76°00'
75°50'
75°40'
75°30'
45°40'
45°50'
46°00'
46°10'
46°20'
46°30'
46°40'
746
745
748
755
757
750
751
753
762
SC 1
SC 2
SC 3
SC 4
SC 5
SC 6



SHIP TRACK RECOMMENDED FOR LEGS 143 (SOLID LINE) AND 144 (DASHED LINE)
BY ATOLLS AND GUYOTS DETAILED PLANNING GROUP

LEG 138 SAMPLING PARTY

- POST-CRUISE SAMPLING PARTY HELD AT ODP/TAMU 21–25 OCTOBER 1992 IN CONJUNCTION WITH POST-CRUISE MEETING.

- 21 PEOPLE ATTENDED POST-CRUISE MEETING (EXCLUDING ODP STAFF) OF WHOM 15 WERE "SERIOUS" SAMPLERS.

- 21,227 SAMPLES TAKEN DURING LEG
  15,086 SAMPLES TAKEN AT SAMPLING PARTY
  36,313 TOTAL SAMPLES TO DATE

- SAMPLING TOOK 60 HOURS OVER 5 DAYS

- JUDGED GREAT SUCCESS BY ALL CONCERNED

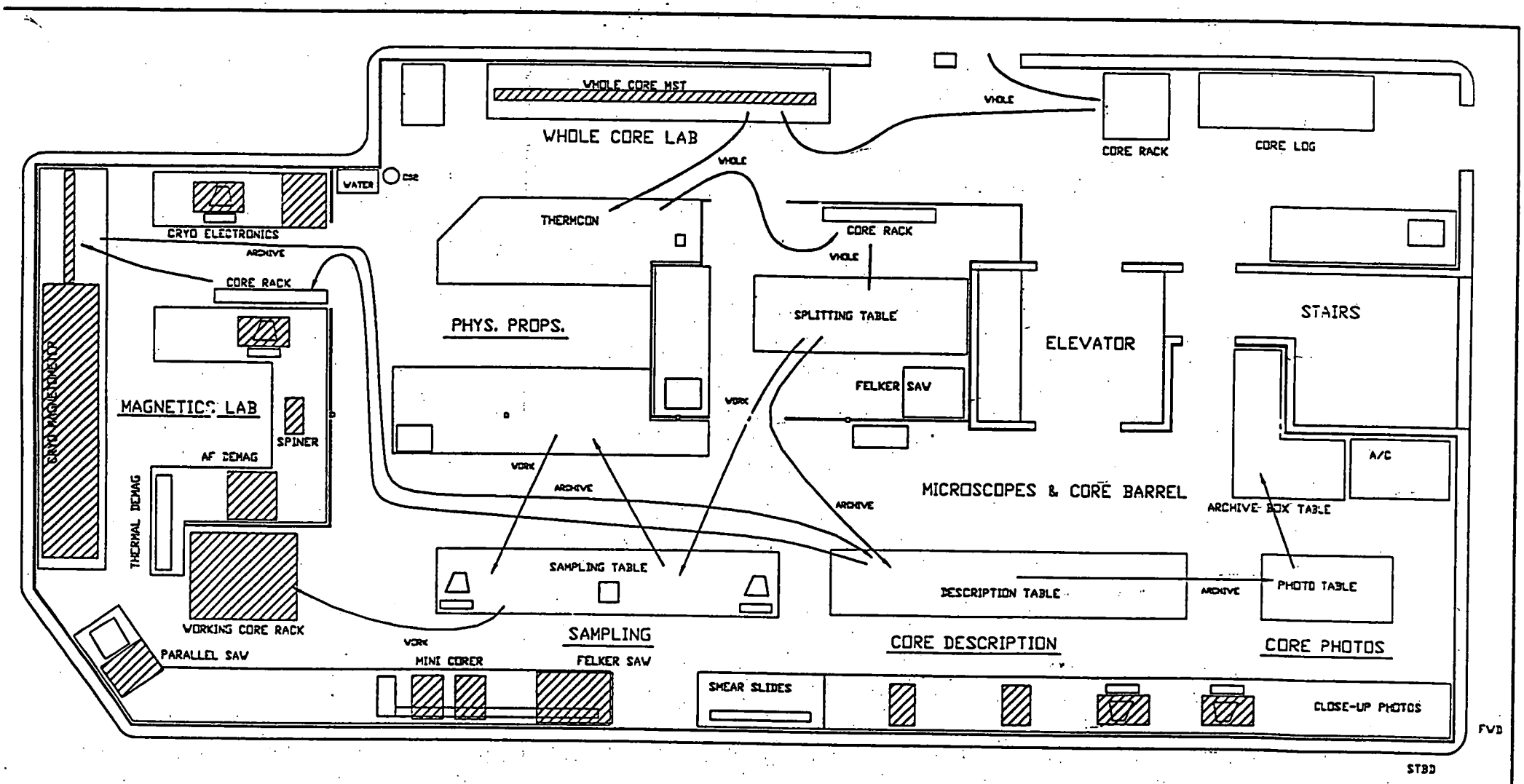
- COST TO ODP/TAMU (PAYROLL, SUPPLIES, SHIPPING) $14,000

- REAL ADDITIONAL COST TO TOTAL PROGRAM (INCLUDING T & S OF PARTICIPANTS) ~$40,000

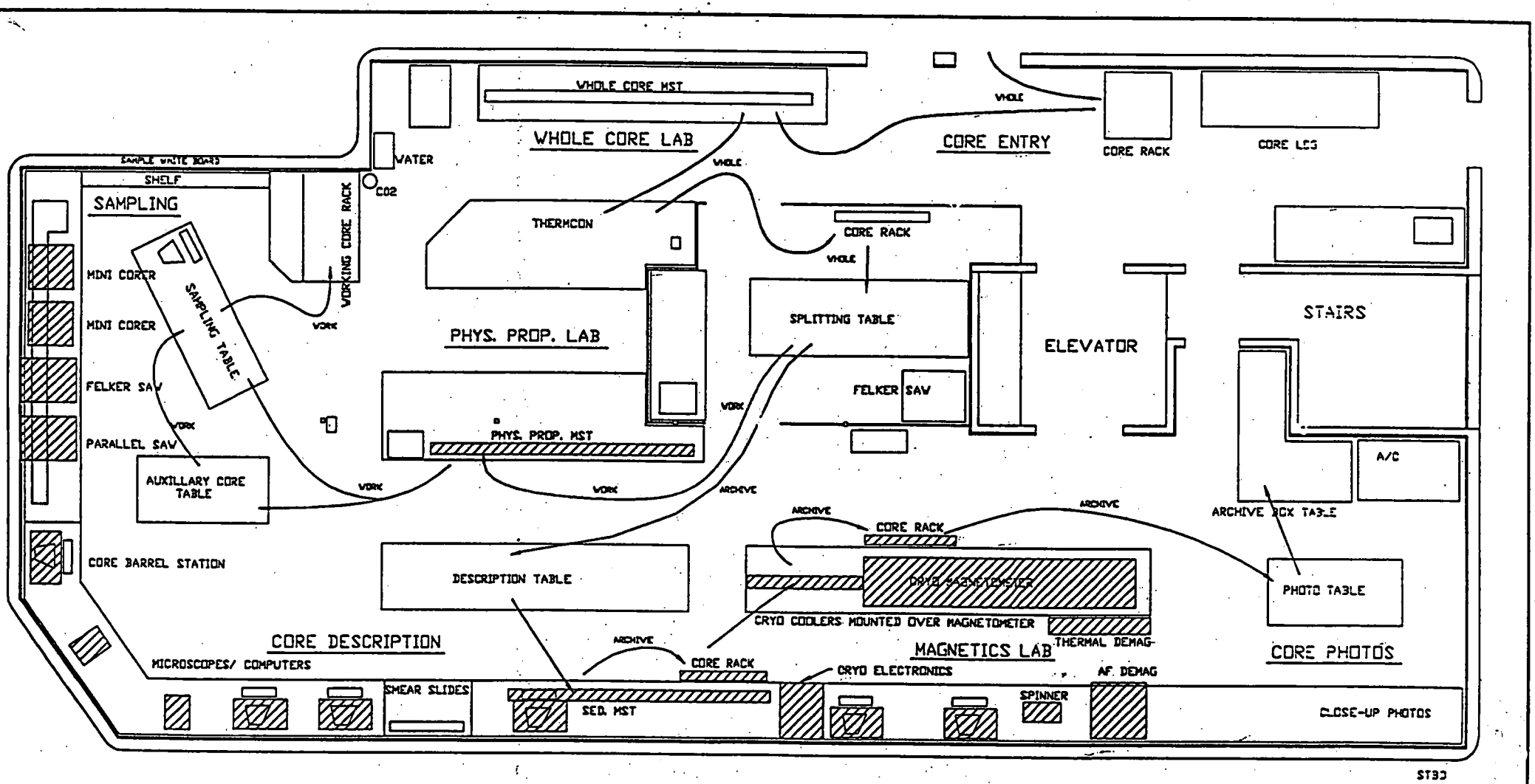
- STAFF AND SPACE LIMITATIONS WOULD MAKE SUCH A LARGE SCALE SAMPLING PARTY DIFFICULT AT THE EAST COAST REPOSITORY.

- FOR COMPARISON, LEG 133 SAMPLING:
  37,148 SAMPLES TAKEN DURING LEG
  3,163 SAMPLES TAKEN POST-CRUISE
  40,311 TOTAL SAMPLES TO DATE

20 NOVEMBER 1991



CURRENT CORE LAB



PROPOSED CORE LAB MODIFICATIONS

STATUS OF EQUIPMENT RECOMMENDATIONS

Rock Eval	PPSP,SMP	**Purchased**
Natural Gamma	DMP,SMP	Under Investigation
Reference Slide Collection	SMP	In Progress
Core Log Integration Workstation	SMP	Under Investigation
Electrical Resistivity	SMP	Under Investigation
Paleontology Software	SMP	In Progress
Real Time Navigation	SMP,SSP,CC	In Progress
Automated Carbonate System	SMP	On hold
Whole Core Photocopier	SMP	On hold
Magnetometer (tow)	SMP	Removed from list
Digital Image Scanner	SMP	Phase I Completed
Whole Core Radiography	CC	Under Investigation
Core Description Computerization	SMP	Near Completion
Core Barrel Magnetometer	SMP	Under Investigation
Color Measurement System	SMP	Under Investigation

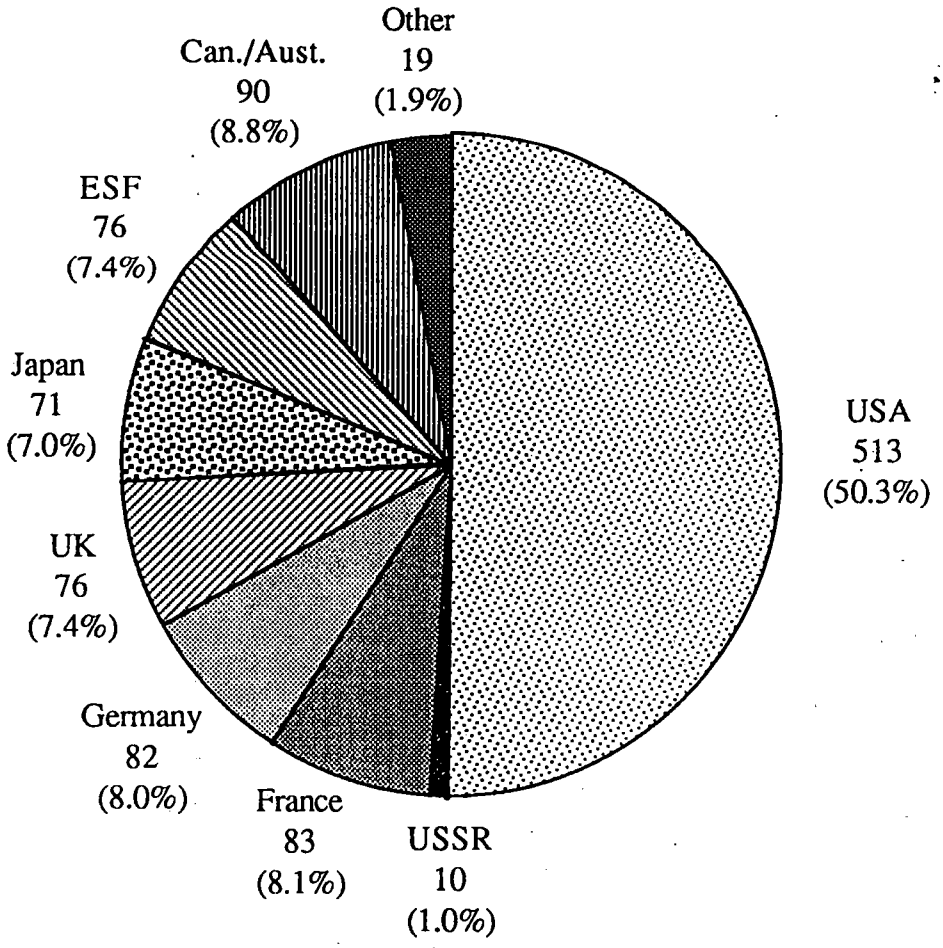
Proposed Distribution Dates of ODP Volumes - Fiscal Year 1992

	Initial Reports Volume	Date to Printer	Date Distributed	Months Post-Cruise	*Scientific Results* Volume	Date to Printer	Date Distributed	Months Post-Cruise
OCTOBER								
NOVEMBER					121	8-91	11-91	41
DECEMBER								
JANUARY								
FEBRUARY	134 135	12-91 12-91	2-92 2-92	14 13	120 122	12-91 12-91	2-92 2-92	46 42
MARCH	136/137	1-92	2-92	12/14				
APRIL								
MAY					123	2-92	5-92	42
JUNE	138	5-92	6-92	12	125	3-92	6-92	38
JULY					126	4-92	7-92	37
AUGUST								
SEPTEMBER	139	8-92	9-92	12	127 128	7-92 7-92	9-92 9-92	37 35

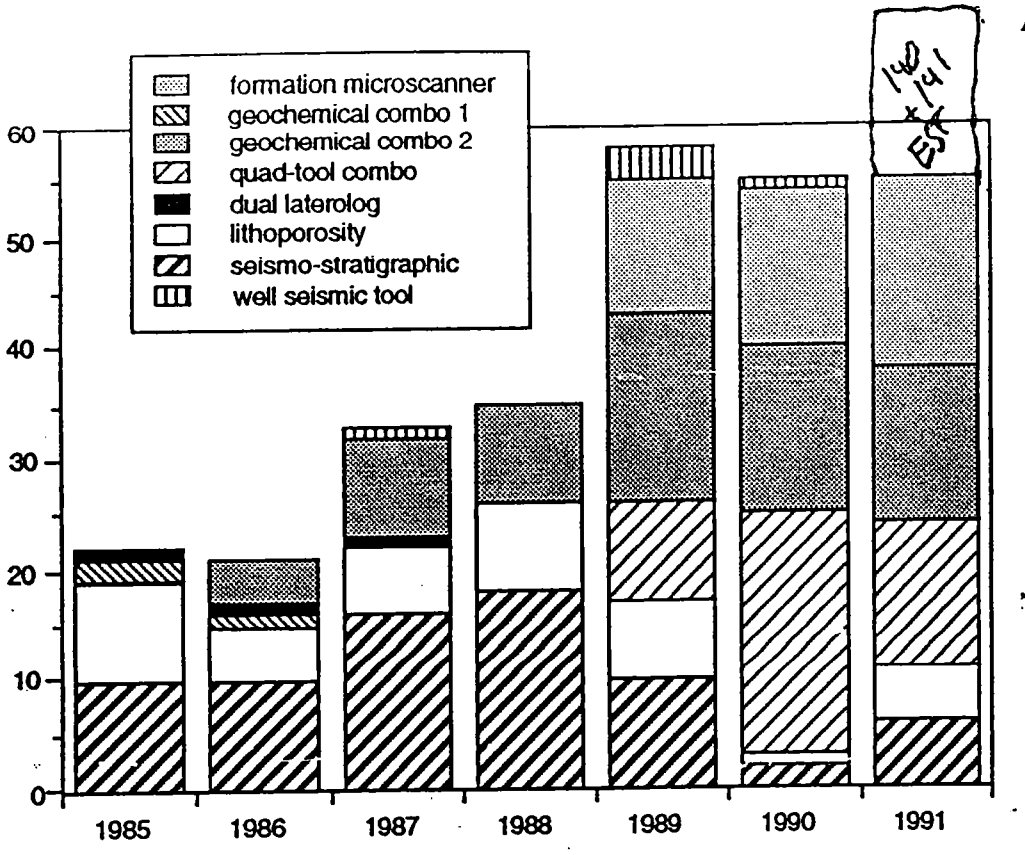
November 27, 1991

SHIPBOARD PARTICIPANT TALLY

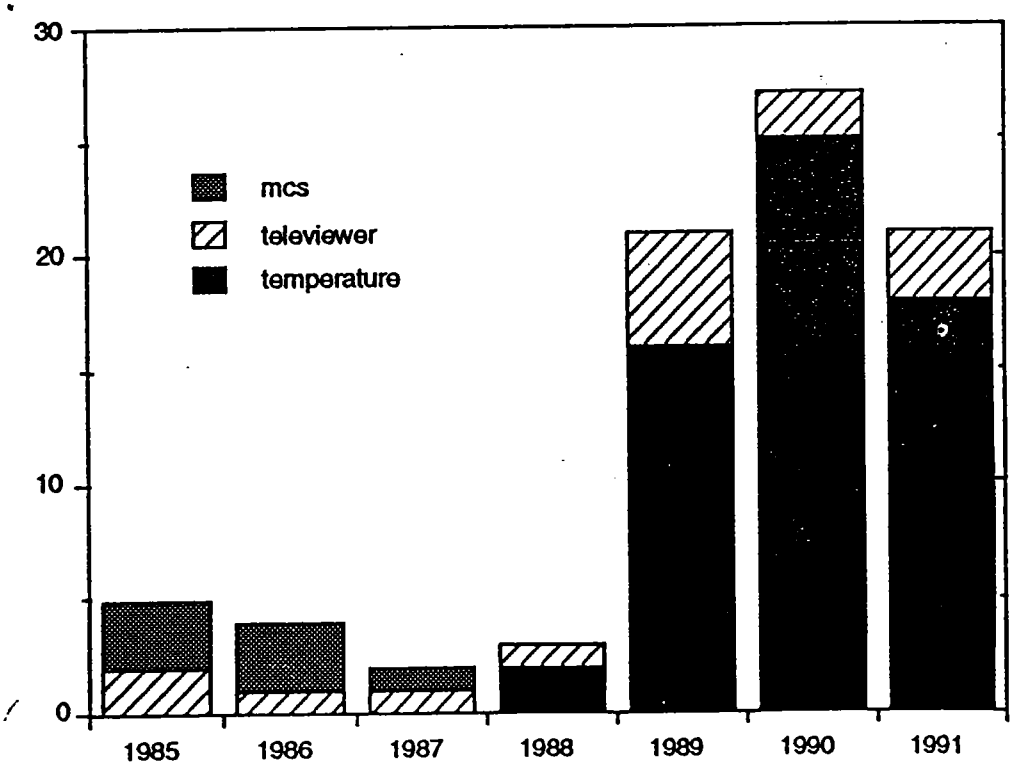
Totals through Leg 142



Total Participants Legs 101 - 142 = **1020**



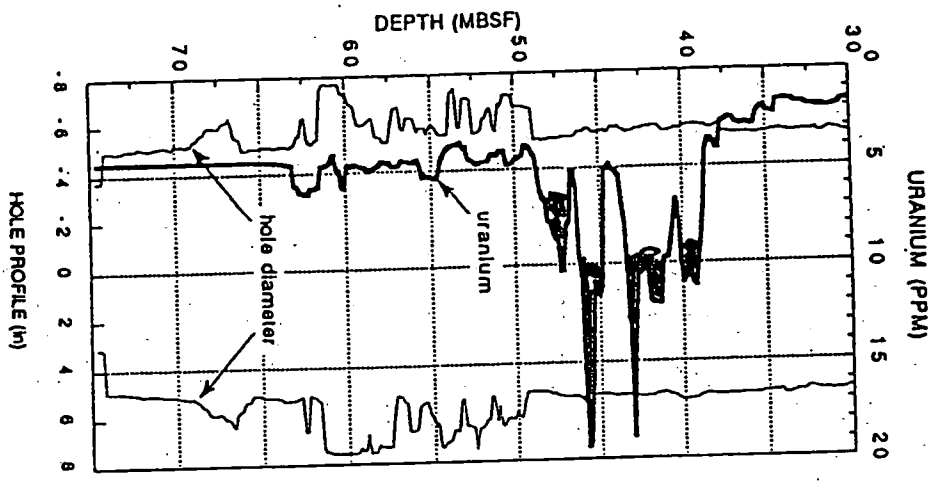
NUMBER OF SCHLUMBERGER STRINGS RUN (LEGS 101-139)

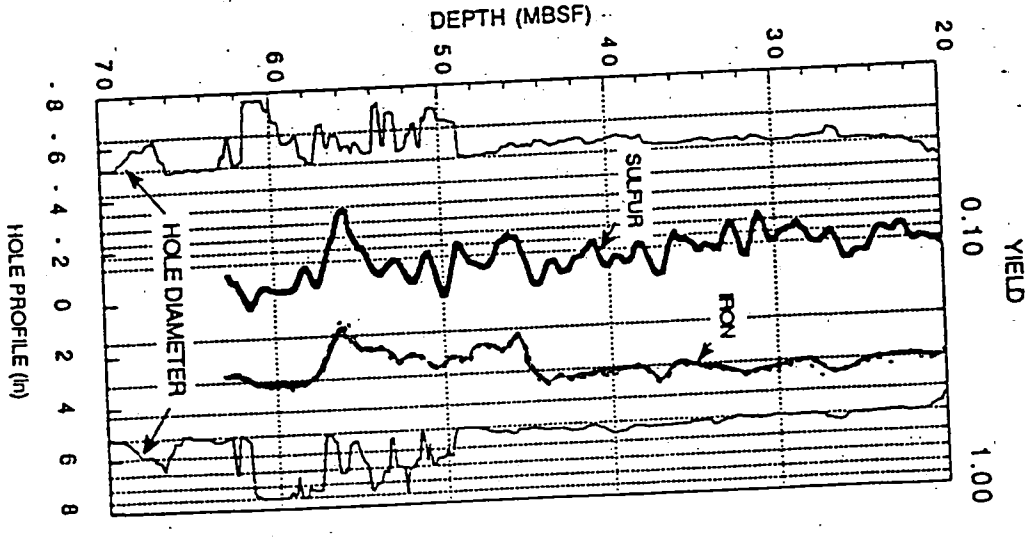


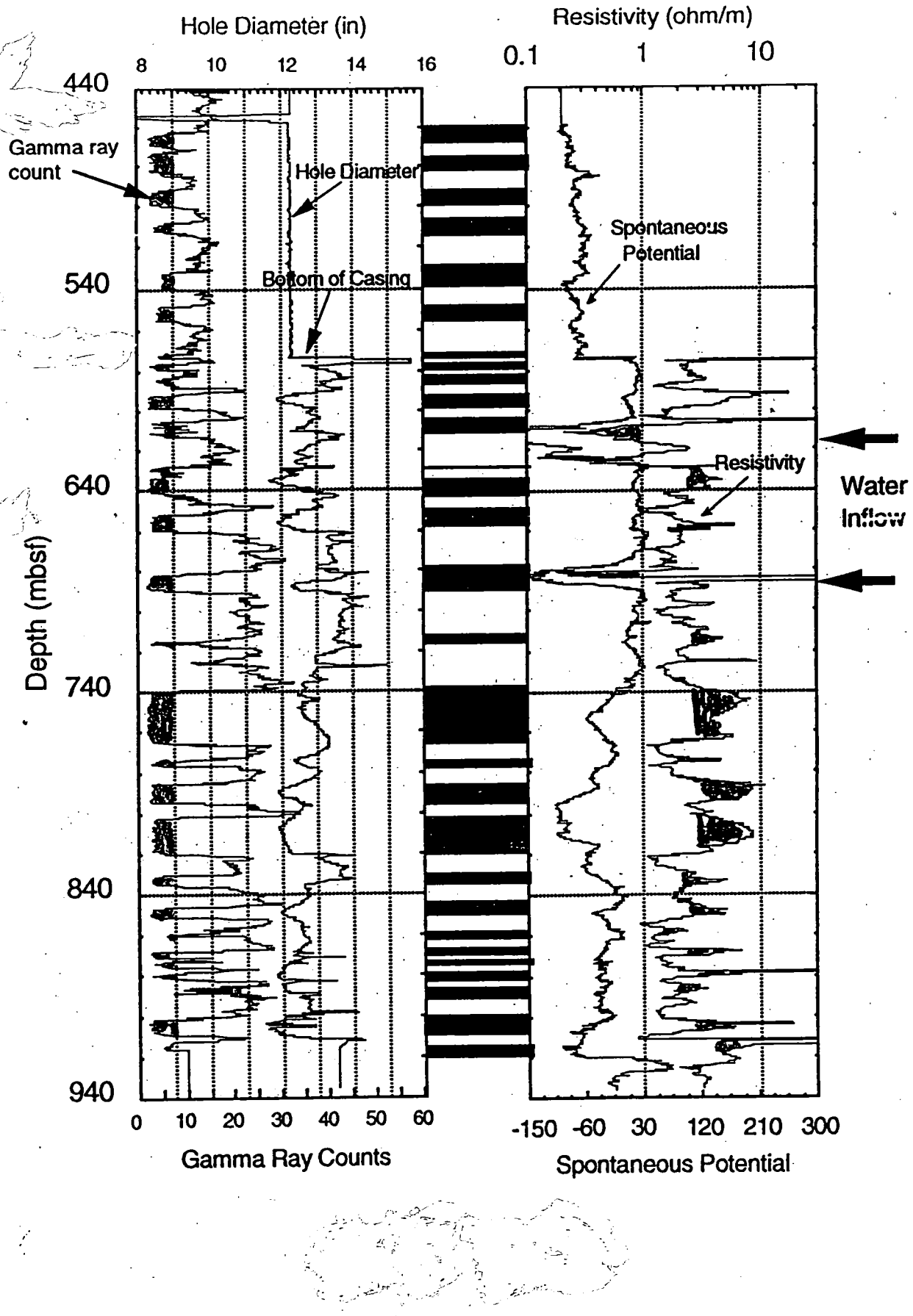
NUMBER OF SPECIALTY TOOLS RUN (LEGS 101-139)

SPECIALTY TOOLS RUN ON LEG 139

Tool	Memory (M) or Wireline (W)	Success Ratio
Sandia GRC Temp	M	11/11
Japex PTF	W	8/8
Adara APC Temp	M	22/24
Strengthened WSTP	M	~15/20
Comprobe flowmeter	W	2/2
GRC Pressure (packer)	M	5/5
LANL Fluid Sampler	M	1/1
Instrumented seals	M	2/2


DEPTH (MBSF)
70
60
50
40
30
HOLE PROFILE (in)
-8 -6 -4 -2 0 2 4 6 8
hole diameter
uranium
URANIUM (PPM)
0
5
10
15
20


DEPTH (MBSF)
70
60
50
40
30
20
HOLE PROFILE (in)
-8 -6 -4 -2 0 2 4 6 8
HOLE DIAMETER
SULFUR
IRON
YIELD
0.10
1.00


Hole Diameter (in)
8
10
12
14
16
Resistivity (ohm/m)
0.1
1
10
440
540
640
740
840
940
Depth (mbsf)
Gamma ray count
Hole Diameter
Bottom of Casing
Spontaneous Potential
Resistivity
Water Inflow
0
10
20
30
40
50
60
Gamma Ray Counts
-150
-60
30
120
210
300
Spontaneous Potential

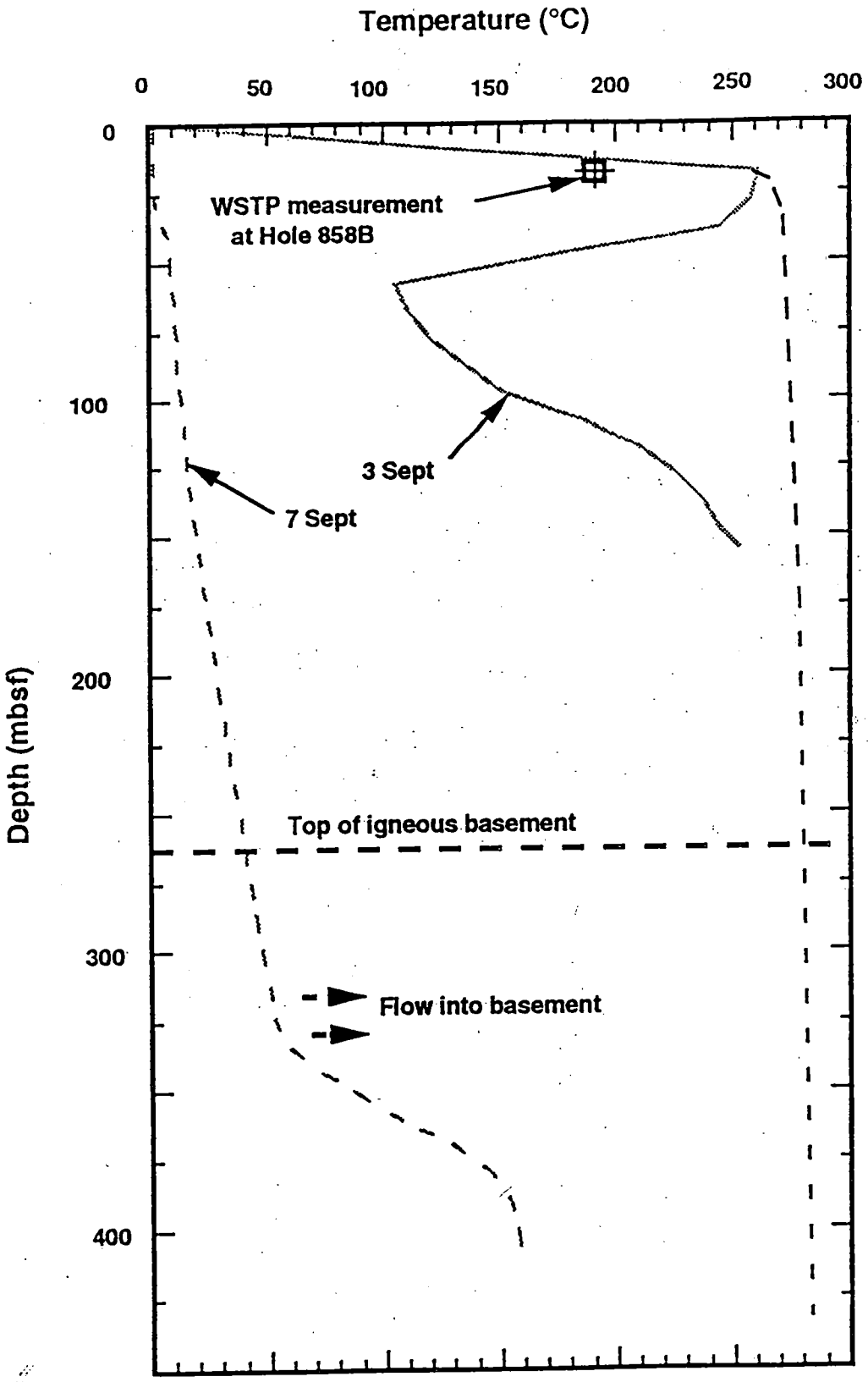
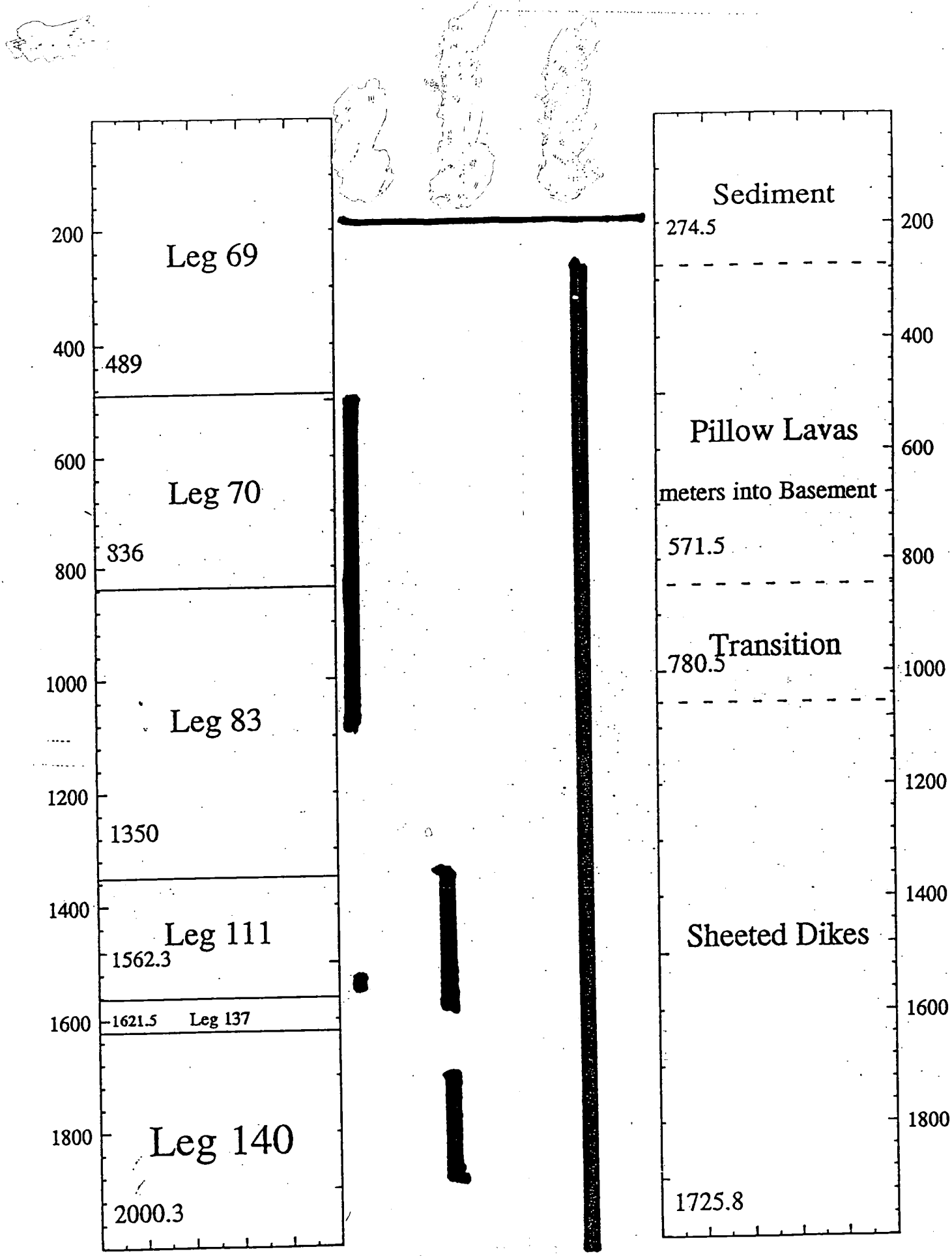
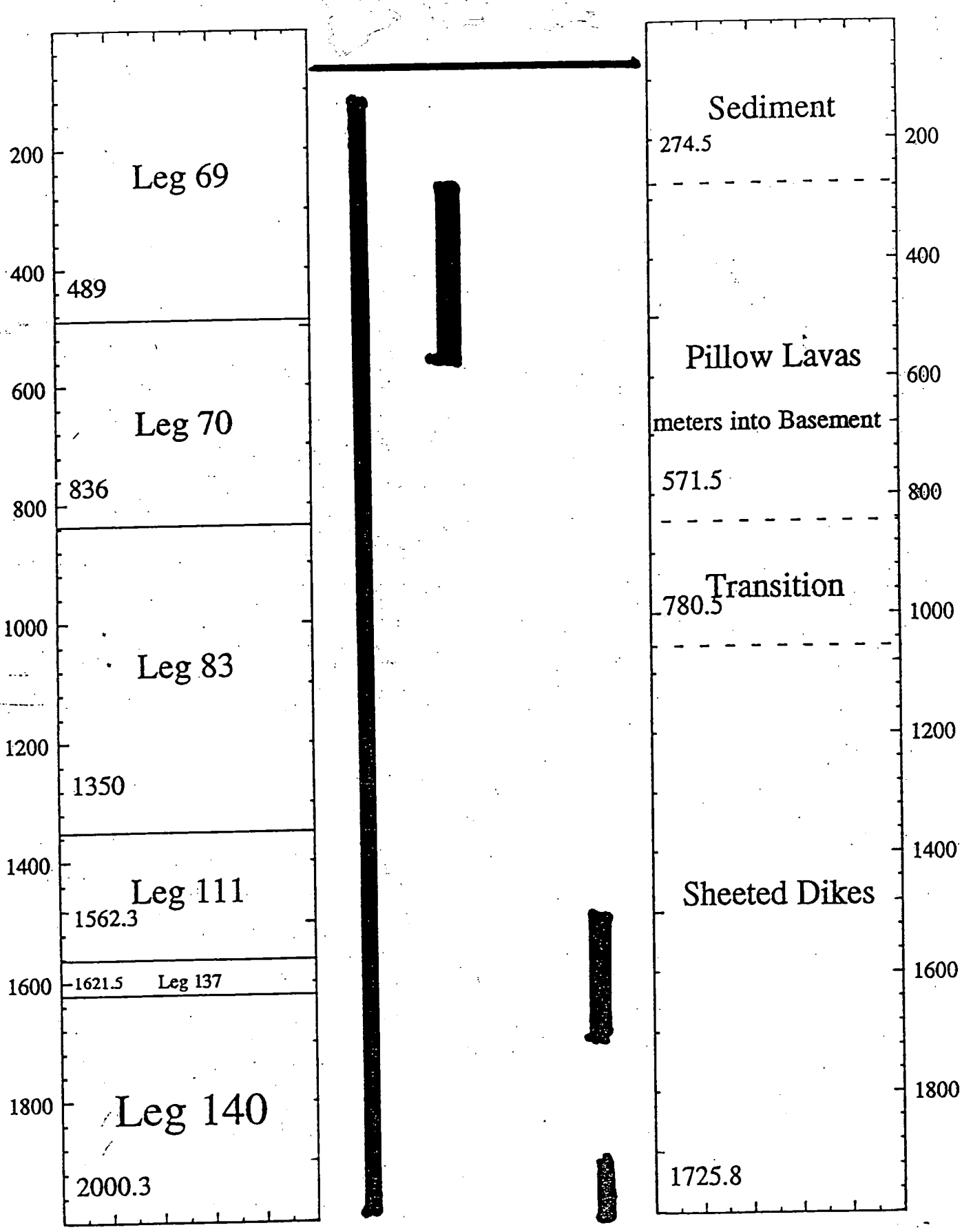
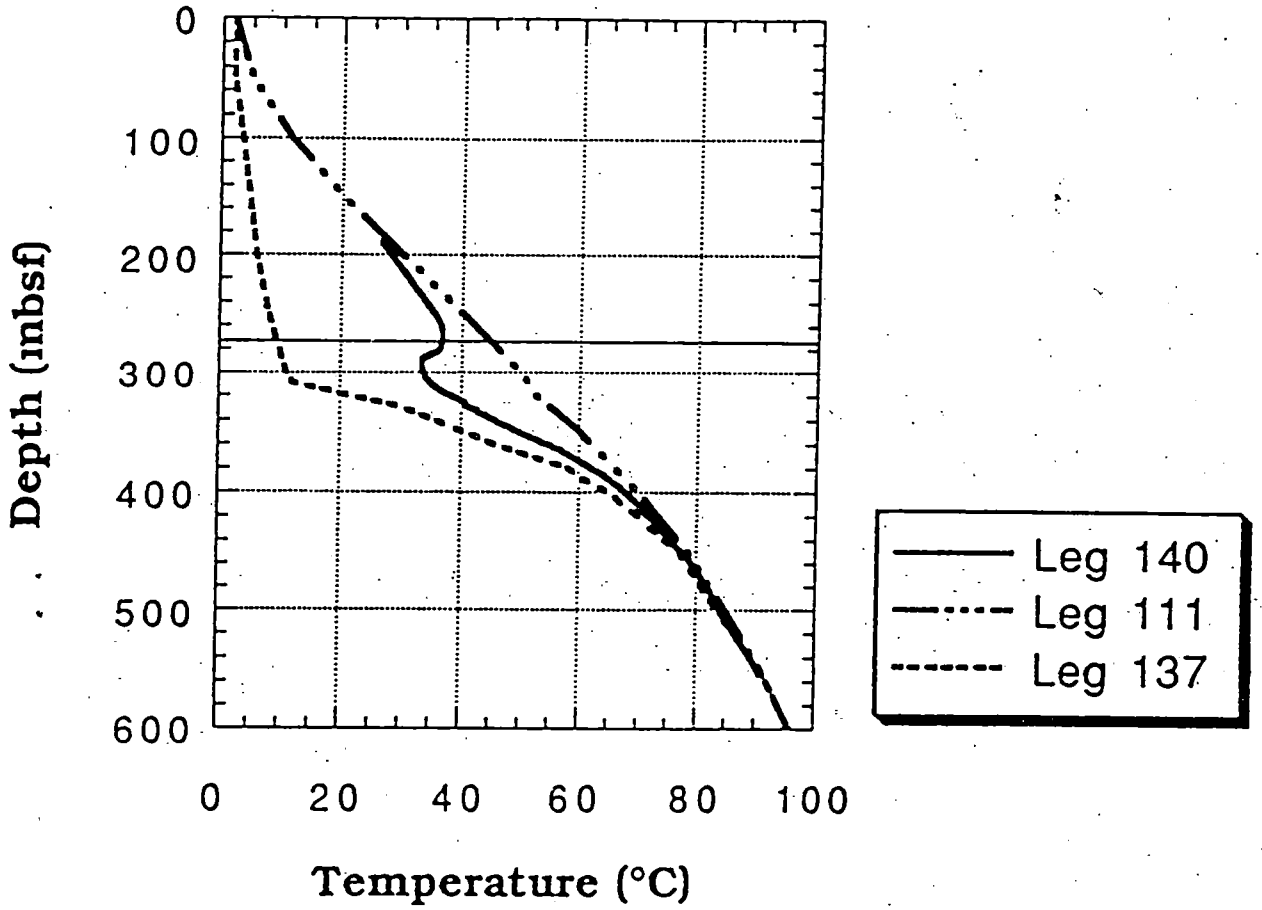


Figure 858-N-5


200
400
600
800
1000
1200
1400
1600
1800
Leg 69
489
Leg 70
836
Leg 83
1350
Leg 111
1562.3
1621.5
Leg 137
Leg 140
2000.3
Sediment
274.5
Pillow Lavas
meters into Basement
571.5
Transition
780.5
Sheeted Dikes
1725.8


Leg 69
489
Leg 70
836
Leg 83
1350
Leg 111
1562.3
1621.5
Leg 137
Leg 140
2000.3
200
400
600
800
1000
1200
1400
1600
1800
Sediment
274.5
Pillow Lavas
meters into Basement
571.5
Transition
780.5
Sheeted Dikes
1725.8

Hole 504B


Depth (mbsf)
0
100
200
300
400
500
600
0
20
40
60
80
100
Temperature (°C)
Leg 140
Leg 111
Leg 137

FY 92
DOWNHOLE PROGRAM

142 —
TEST OF DCS LOGGING

143 —

144 —
TEST OF JAPANESE
MAGNETOMETER

145 —
LETI MAGNETIC SUSCEPTIBILITY
(LOW RES)

146 - MAJOR DOWNHOLE PROGRAM
FLUID SAMPLING / PERMEABILITY

FY 1993 Downhole Measurement Technology Needed

RISK*	PROGRAM	NEW TECHNOLOGY NEEDS
9	Alboran Basin/ Med Gateways	High resolution susceptibility tool desirable
6	Mediterranean Ridge	Fluid Sampling (wireline packer, Geoprops, other?)
9	Eastern Equatorial Atlantic Transe	Ready
9	New Jersey Sea Level	High resolution susceptibility tool desirable
3	TAG Hydrothermal	slimhole High T temperature and fluid High T cable slimhole High T resistivity slimhole hole cooling
9	VICAP	High resolution magnetometer/susceptibility tool desirable
9	Ceara Rise	High resolution susceptibility tool desirable
9	Mediterranean Sapropels	High resolution susceptibility tool desirable
8	NAAG	High resolution susceptibility tool desirable
8	NAFM	Ready
8	Offset Drilling	High resolution magnetometer/susceptibility tool desirable

* Subjective 0 - 10 rating, 10: Success Certain, 0: failure certain

JOIDES DOWNHOLE MEASUREMENTS PANEL

Annual Report to PCOM : 4/12/91

Meetings Held: 1991

February :	ODP-TAMU, College Station
June :	LDGO, New York
October :	AGC, Halifax, NS

Meetings Planned: 1992

28-30 January :	Kailua-Kona, Hawaii
2-4 June :	Windischeschenbach, FRG *
September :	Santa Fe, NM

* Joint meeting with KTB

MEMBERSHIP STATUS

Current Panel Breakdown

USA	→ 9	members
International Partners	→ 7	" "
Total	→ 16	" "

Universities	6	(2 - JOIDES Instns)
Government Labs and Instns.	5	
Oil Industry	5	

Membership Changes : 1991-2

Rotate Off	Replaced By
Carson (USA)	Desbrandes (USA)
Villinger (FRG)	Draxler (FRG)
Stephansson (ESF)	Balling (ESF)
Karig (USA)	Hickman (USA)
Wilkens (USA) *	? ?

* To rotate off January 1992

HIGHLIGHTS 1991

1. Shipboard computer-based integration of core and log data

2. In-situ pore fluid sampling : working group

3. High temperature downhole measurements

4. Downhole measurements : Leg 139

5. Logging in tectonically active areas : working group

6. Links with SGPP

7. Promotional presentations : ODP technology
   - London (May 91)
   - Victoria BC (Sept. 91)

8. Publications
   - Encyclopedia of Earth System Science (92)
   - Int. Yearbook of Science & Tech. (93)

9. [illegible] of SPE Paper on

JOIDES WORKING GROUP ON IN-SITU PORE FLUID SAMPLING

Purpose

(i) to formulate recommendations for technological development

(ii) to identify most promising options as a lead-in to an engineering feasibility study

Conveners

P. F. Worthington D. Huey

Date

23 August 1991

Report Issued

September 1991

Report Endorsed by DMP

October 1991

Options

(in decreasing order of operational impact)

(1) Upgraded wireline packer, possibly as an internal element with the straddle packer

(2) Self-boring pore fluid sampler (with RCB)

(3) Full-bore (multiple) straddle packer, possibly set in redrilled cement plug

(4) "Top-hat" re-entry deployment of modified commercial formation testers

(5) Conventional or modified drill-stem testing technologies

Next Stage

Engineering Feasibility Study

Notes

(i) Producing boreholes - possibly different approach

(ii) Different approaches for different rock types ?

∴ Therefore, > 1 option is required.

Recommendation

Steering group to direct the implementation of the working group report.

Steering group to comprise representatives of LDGO, TAMU, DMP and SGPP, with a PCOM Liaison

Group to meet three times:
- when funds become available
- when bids are received
- when feasibility study completed

Day-to-day supervision of consultants and contractors - TAMU.

Quote

"This is the most professional approach to the planning of engineering development that ODP has taken to date; all too often the development phase is decoupled from the scientists"

ANON. 1991

DIRECTIONS FOR 1992

1. Options for pore fluid sampling.
2. Integration of core and log data.
3. Public information brochure on downhole measurements.
4. Third party tool procedures - enforcement
5. Log data acquisition, processing and distribution.
6. COSOD II technologies
7. Lithosphere characterization

CAUSES FOR CONCERN

1. Reversion to pre-1987 mentality re the role of logs in ocean science
   - reluctance to log because it "impacts" on core acquisition

2. Inadequate general awareness of the scientific legacy of ODP holes in terms of integrated databases
   - overfocused mentality
   - antiquated views

REMEDIES

Education

Information

Showing Results

1990-1991

- Shipboard Laboratory Reviews
- Discrete Measurement of Index Properties
- Core-Log Data Integration
- Core Disturbance
- Technical Staff
- Equipment Needs
- Upcoming Legs

Shipboard Laboratory Reviews

Paleomagnetics: core contamination/magnetization

Micropaleo: reference slide collection

Physical Properties: natural gamma; resistivity; optimize

Sedimentology: colour; smear slides

Petrology: XRF sediment analyses

Geochemistry: survey; equipment upgrades

Underway Geophysics: navigation equipment; streamer

Shipboard Measurements Panel

Discrete Measurement of Index Properties

Status:

Recommended Procedures

Initial Use: Too many options

Future:

Revisions in progress

Reduce numbers of discrete measurements (CATSCAN)

Core-Log Data Integration

Equipment Requirements in priority order

- Core/log data integration workstation (Feb 1992)
- Natural gamma equipment for core measurements (Leg 145)
- Magnetic susceptibility downhole tool (?)
- Sonic core monitor (Leg 141)
- Automation of the phys. prop. lab (March 1993)
- Resistivity imaging equipment for the cores (?)

Data Handling

- Software modules for:
  - interpolation
  - smoothing/filtering
  - depth matching
  - graphics
- Database development (input/output)

Personnel

- Manager responsible for development of this 'system'
- Data Correlation Specialist in scientific party

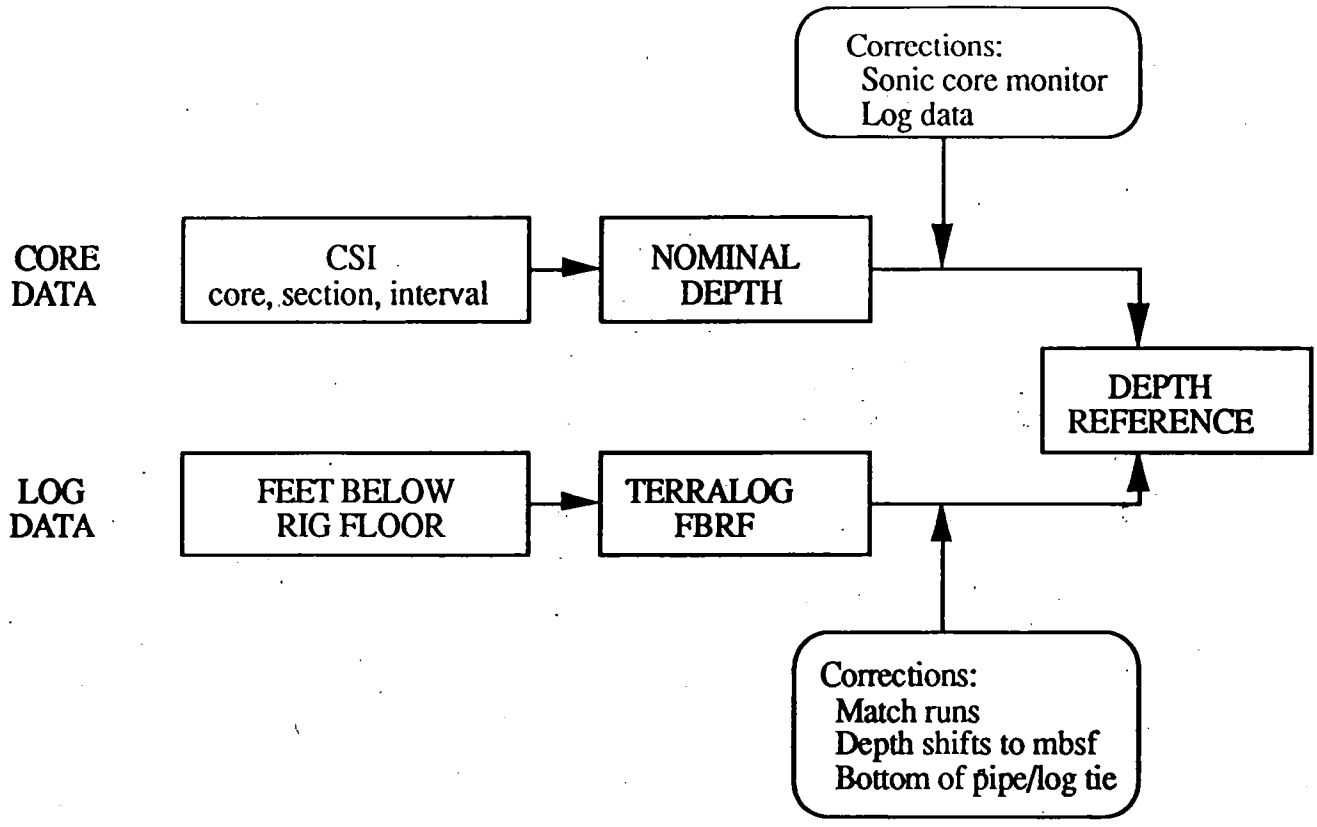


Figure 1 Common Reference Depth

Core Disturbance: Downhole Operations

Placement of an accelerometer in the piston of the APC in conjunction with mud pressure monitoring could be used for evaluation of sample disturbance.

Slim nosed APC cutter shoe should be used instead of the currently used blunt-nosed cutter shoe. The engineering group should modify the cutter shoe design to follow the recommended Hvorslev parameters.

The meeting participants endorsed coating the inside of the drill pipe along with the development of a regular maintenance and rotation plan to eliminate the rust contamination in APC core.

Design work on the break-away piston should continue

An evaluation of the track record of the XCB in terms of sample quality would provide a good base for design improvements.

Shipboard Measurements Panel

Core Disturbance: Shipboard/Lab Operations

Sampling and measurement of sediment should not be performed at the edge of the core sample, adjacent to the liner.

A support or strong-back should be used to move the working split half from station to station in the laboratory.

High resolution (3/section) density and shear strength determinations should be made on selected APC holes for Leg 145 to better assess mechanical disturbance.

The participants encourage the study of the effect of core handling (including bending) on stress-strain properties.

Improve splitting methods

To obtain good quality pore water geochemistry, precautions should be taken

Consolidation tests on representative whole-round samples from each lithology at a site should routinely be run for stress relief corrections.

Shipboard Measurements Panel

Technical Staff

Last year's recommendation unchanged

Specific training for micropaleo sample processing needed

Cycling of staff among labs is not encouraged

Equipment Needs

- Natural gamma and MST upgrade
- Reference slide collection
- Computer workstation for core-log data integration
- Resistivity equipment for discrete core measurement
- Core barrel magnetometer
- Colour measurement instrument
- Carbonate autosampler
- New IC (replacement)
- Xerox for whole core imaging of hard rock samples

Upcoming Legs

Atolls and Guyots Legs :

elemental analyses using the XRF are required for calibration of the geochemical logging tool

core recovery may be very low at all sites on this leg; expedite the acquisition of the natural gamma core logging tool so that the best possible core-log data integration tools are available for these legs.

Leg 146:

the panel is still concerned that limited log data will be acquired on to Cascadia. High resolution sample intervals for physical properties, structural geology, and pore water geochemistry are needed.

Shipboard Measurements Panel

Report of Geochemistry Survey (19/45 respondents - 42%)

I. Routine frozen OG samples:

Community concurs with PCOM decision to terminate routine OG sampling.

Non-routine sampling may still require facilities for shipping and storage, both aboard ship and ashore, of frozen samples.

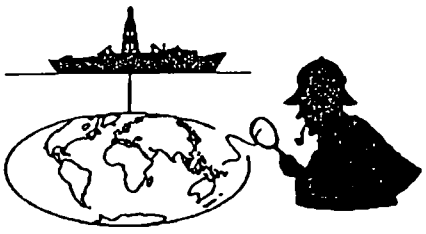
Frozen samples collected through Leg 134 should be retained and kept frozen, pending the results of (a) degradation studies and (b) advertising.

The existence of this collection should be advertised as widely as possible to the community. ODP should consider cataloguing these samples (lithologies and Corg contents) and making this catalog widely available.

Cataloguing and advertising the collection should increase the number of sample requests. If not, samples could be returned to the collection after some minimum time period, perhaps 10 years

II. Use of units for IW analysis

III. Addition of new equipment to the Chem Lab



ODP SITE SURVEY PANEL

SSP ANNUAL REPORT: 1990-91

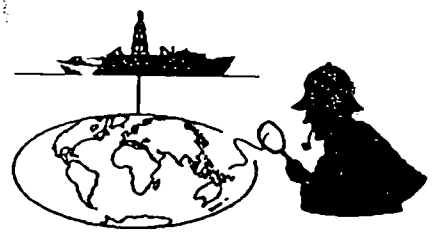
1. SITE SURVEY PANEL met twice during 1991:
   March 26 to 28 at ODP/TAMU
   October 8 to 10 at ORI, TOKYO.

2. In Texas: SSP completed final reviews and approved drilling for the remaining CEPAC programs to be drilled in FY '92 but retained a watching brief on details of data package preparation for the following legs:

Hess Deep	Atolls & Guyots
Chile Triple Junction	N. Pacific Neogene
East Pacific Rise	

   SSP revised its guidelines for the JOIDES Office publication of Proposal Submission Guidelines in JOIDES Newsletter in June 1991.
   SSP set in place procedures for dealing with S. proposals.

3. In Tokyo: SSP's main charge was to provide initial assessments of the status of site survey data in the FY '93 North Atlantic Prospectus as prepared by JOIDES Office to Sept '91. Little original data was provided for this meeting by proponents and the Panel has made a number of general and individual recommendations to PCOM for procedures to handle the proposals that become incorporated in the FY '93 schedule. The highest priority must be given to data submission for review at SSP's April '92 meeting.
   SSP approved the data package prepared by TAMU in support of test drilling at Enewetak Atoll. Some detailed recommendations on the already approved data packages, Atolls & Guyots and N. Pacific Neogene were updated; and the Hess Deep Data Package remains a cause for concern.



ODP SITE SURVEY PANEL

SSP CAUSES FOR CONCERN: DECEMBER 1991

1. SSP's CURRENT RESPONSIVE MODE DOES NOT ALLOW FOR BEST ASSESSMENT OF PROPOSALS
   Erosion of 2 yr + leadtime
   No data available at Tokyo Meeting
   But better guidelines
   Must have data on scheduled legs for April '92 meeting
   Onus on Proponents
   --- Request PCOM motion on data submission

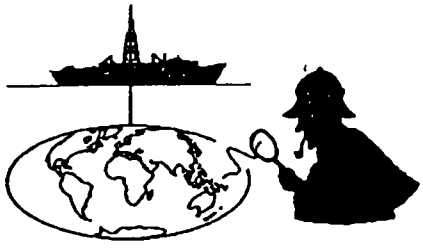
2. HOW DOES SSP AVOID CONFLICT ONCE PROPOSALS ARE ON THE SCHEDULE?
   --- PCOM asked to define back-up legs in schedule; particularly if site survey data for legs on the schedule is still to be collected.

3. SSP NEEDS LATEST INPUT OF THEMATIC PANELS TO STAY CURRENT OF PROPOSALS CURRENTLY RANKED AND "IN CONTENTION"
   --- PANCHM/PCOM asked to consider a schedule of Panel Meetings which separates thematic from SSP from PCOM meetings by around one month in each case.

4. FURTHER SSP GUIDELINES ON THE WAY FOR NEW ODP GUIDE including for BSR and Offset Crustal Drilling
   --- SSP requests a liason to the Offset Crustal Drilling W.G.

5. HESS DEEP FIASCO - Relates to Items 2 & 4 above

6. SSP Membership - Request for 4 year term



ODP SITE SURVEY PANEL

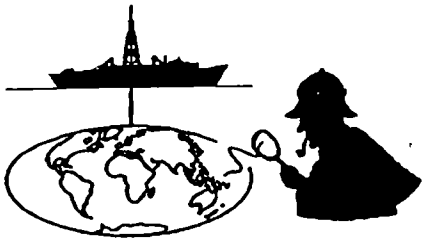
TOKYO CONSENSUS ITEMS

SSP Consensus 4: SSP will continue updates to its guidelines at its next spring meeting for JOIDES Office's proposed new 'ODP GUIDE'. They may include requirements for:

BSR Drilling.
Offset Crustal Drilling.
Deep-towed geophysical surveys.

SSP Consensus 7: As of our meeting, a decision is expected within the week as to whether the *Resolution* will drill Hess Deep in the second half of the current leg (Leg 140). No data whatsoever from Hess Deep has been received at the ODP Data Bank, and no substantive data is included in the Leg 140 prospectus. SSP wishes to express its concern and dismay that the system of checks and balances, which normally ensures that an adequate data package is available to the ODP community, appears to have been circumvented. SSP urgently looks forward to working with proponents on the data package for future Hess Deep drilling.

SSP Consensus 8: SSP Chairman (Kidd) should request of PCOM Chairman that an SSP member (Kastens) attend the next meeting of the Offset Drilling WG to contribute to discussions of survey requirements, some of which are as yet unclear to SSP itself.



ODP SITE SURVEY PANEL

TOKYO CONSENSUS ITEMS

SSP Consensus 1: SSP revised its watchdog assignments for this meeting to include :

Mediterranean Ridge	(330)	--- Farre
VICAP Gran Canaria	(380)	--- Von Herzen
Ceara Rise	(388)	--- Meyer

SSP Consensus 2: Because of our infrequent meetings and the commonly occurring need for multiple iterations, SSP normally needs 2 years lead time to compile and evaluate the data for a drilling leg. If the thematic review process produces high priority programs with a shorter lead time, we will make a best effort to evaluate them. However, in such cases the burden will be on the proponents to present, without delay, a complete high quality data package to SSP.

SSP Consensus 23: Kidd to relay to PCOM a request that, should they schedule drilling in FY'93 that is clearly dependent on the collection of further site survey data, PCOM should define a back-up alternate leg to take place in the event that the surveys are not completed. This is to put responsibility and pressure to deliver on proponents. SSP would in turn discuss cruise plans and required data processing, liase closely with proponents and possibly meet more frequently in abbreviated session to view data with proponents.

DCS II

- SAFETY CONCERNS:
  - Slingshot tests satisfactory.
  - Hot fluid / gas can be diverted.
- TEDCOM RECOMMENDS:
  DCS II should not be condemned prematurely (Although it will never be v. efficient).

DCS III

- LONG TERM DEVELOPMENT (no precedent
- SAFER AND MORE EFFICIENT THAN DCSII.
- RFP (June '91). 3 RESPONSES. 2 PURSUED.
  - Tensioners ($500,000) by E & W.
  - Counterweights ($250,000) by Stress Eng.
- TEDCOM PREFERS: TENSIONERS.
  - TECHNOLOGY should be accessible.
  - TENSIONERS minimize axial movements between strings.
- TEDCOM RECOMMENDS:
  - Study consequences of removing 'guide horn' to simplify tensioner solution.

LEG 142

- Leg v. short (35 days on site).
- DCB unlikely to recover core.
- Secondary objectives a distraction.
- TEDCOM approves:
  - Simplification of HRB.
  - Nested DI-BHA system.
  - 2 mining drillers on board.
- TEDCOM recommends:
  - DCS be tried to a maximum.
  - If time, core 0–100 mbsf several times.

DEEP DRILLING

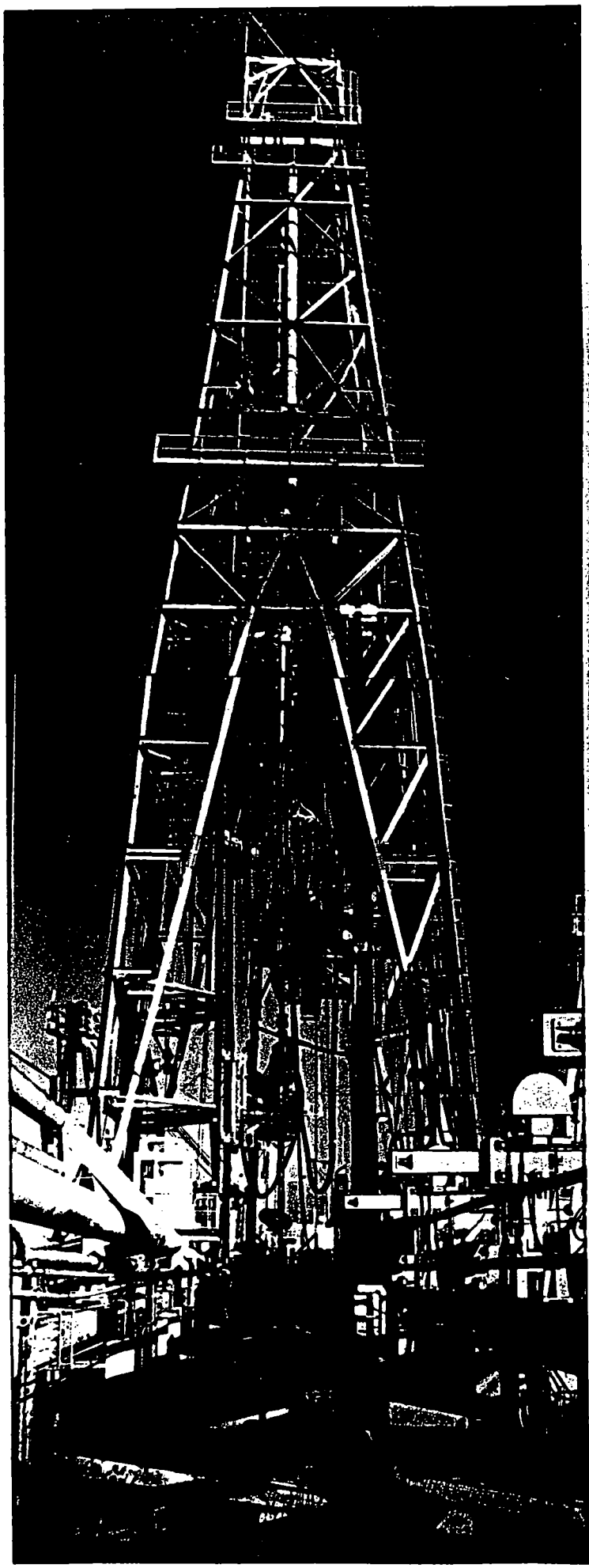
TEDCOM RECOMMENDATIONS (Kona '90) WERE NOT PURSUED. WHY?

DIVERS

- Joint development of PCSSC by ODP/UTB?
- DEA projects

TEDCOM MEMBERSHIP

John	COMBES	Chevron
Keith	MILLHEIM	Amoco
Frank	SCHUH	Consultant
Earl	SHANKS	MEPSI
Howard	SHATTO	Consultant
Wally	SVENDSEN	Consultant
Hiromi (Junzo	FUJIMOTO KASAHARA	Univ. of Tokyo Univ. of Tokyo)
Mikhail	GELGAFT	VNIIBT
Keith (Roxanne	MANCHESTER CHRIST	Bedford Inst. of Oceanography Monash Univ.)
Claus	MARX	ITE
Alister	SKINNER	BGS
Michel	TEXIER	ELF
Sevrrir	THORHALLSSON	Orkustofnun, Reykjavik
Heinrich	RISCHMULLER	KTB
Charles	SPARKS	IFP



DIAMOND CORING SYSTEM

PHASE I – 2000 METER

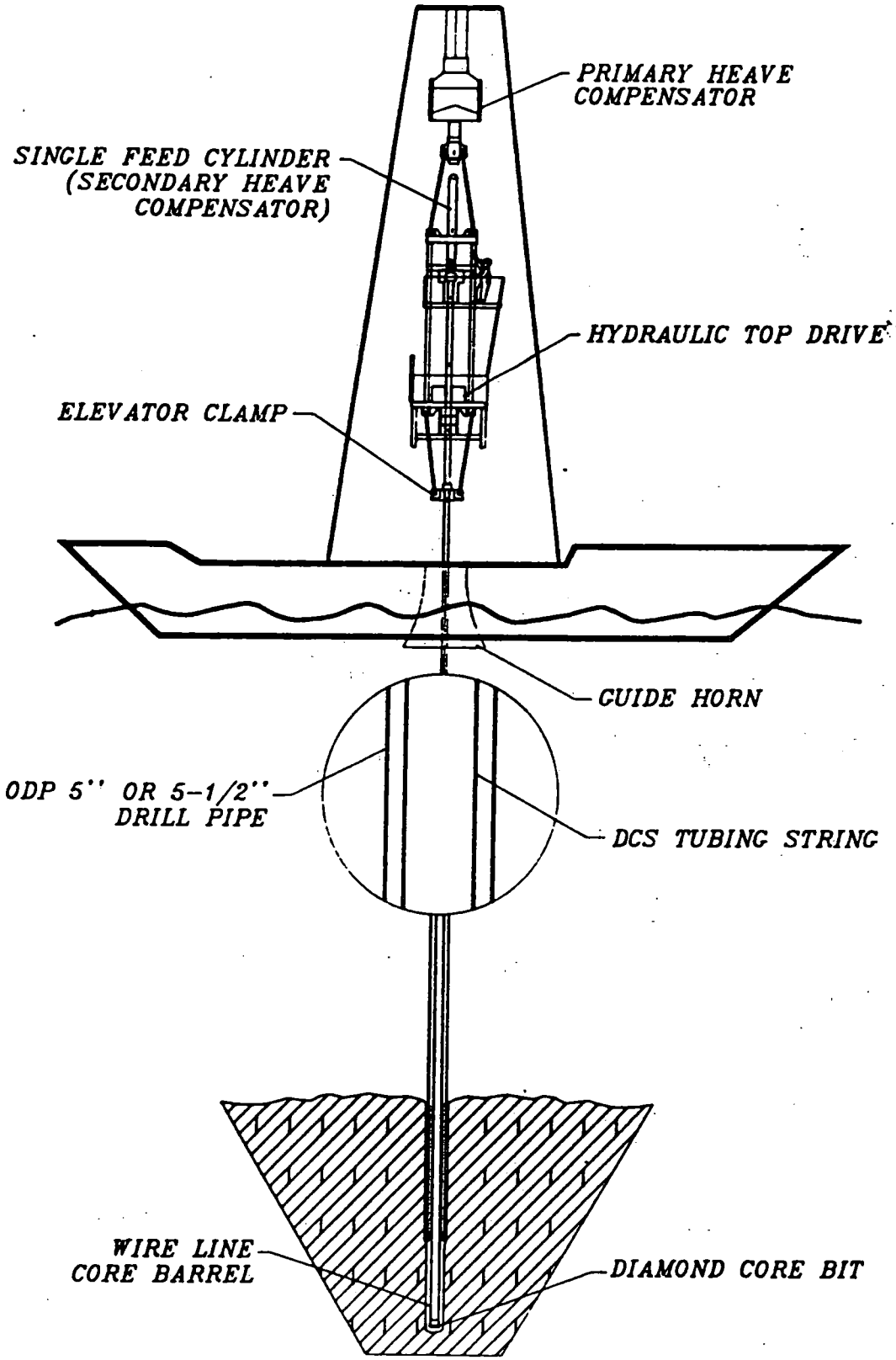


Figure 2

DIAMOND CORING SYSTEM

PHASE II – 4500 METER

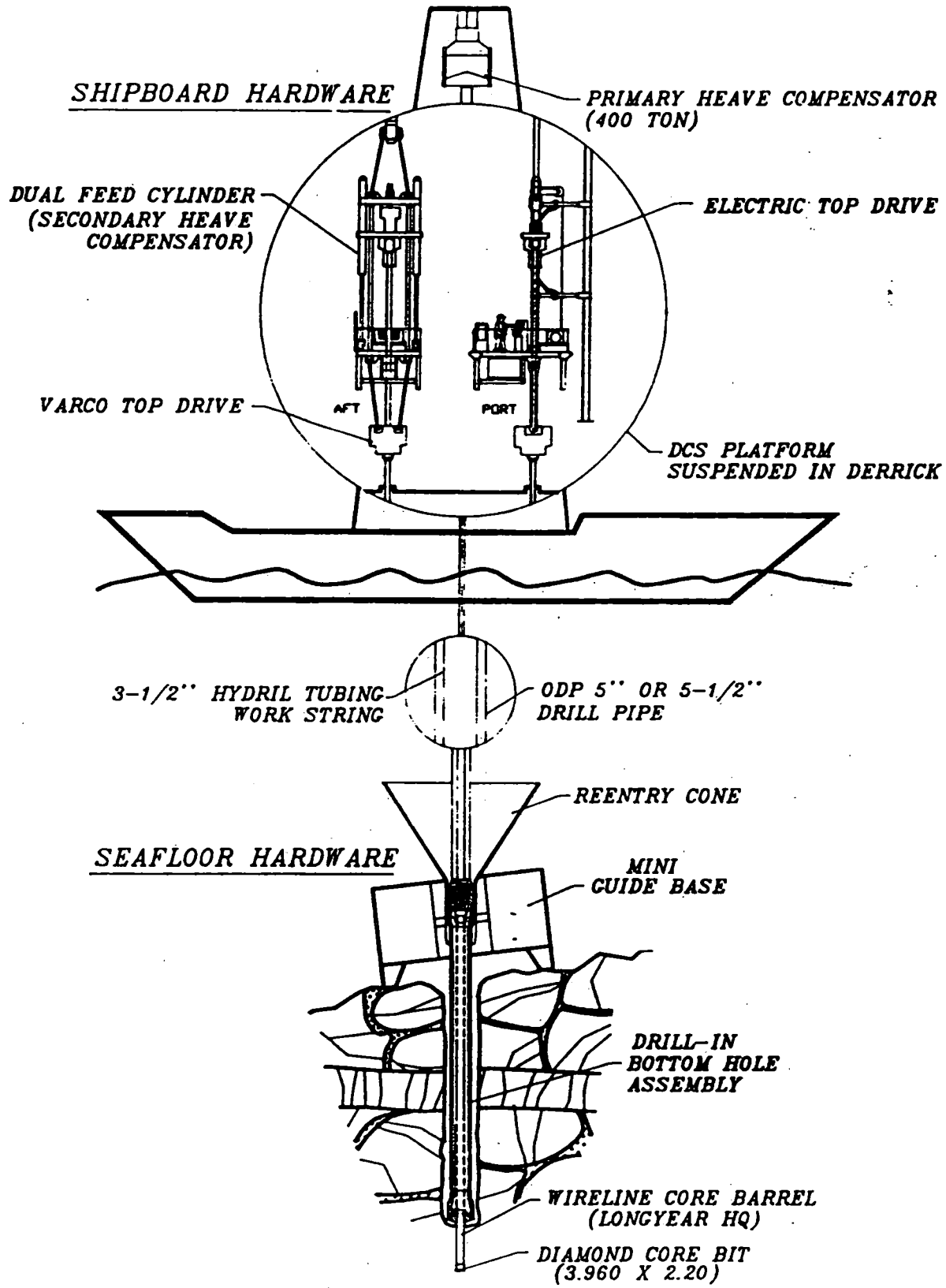


Figure 4

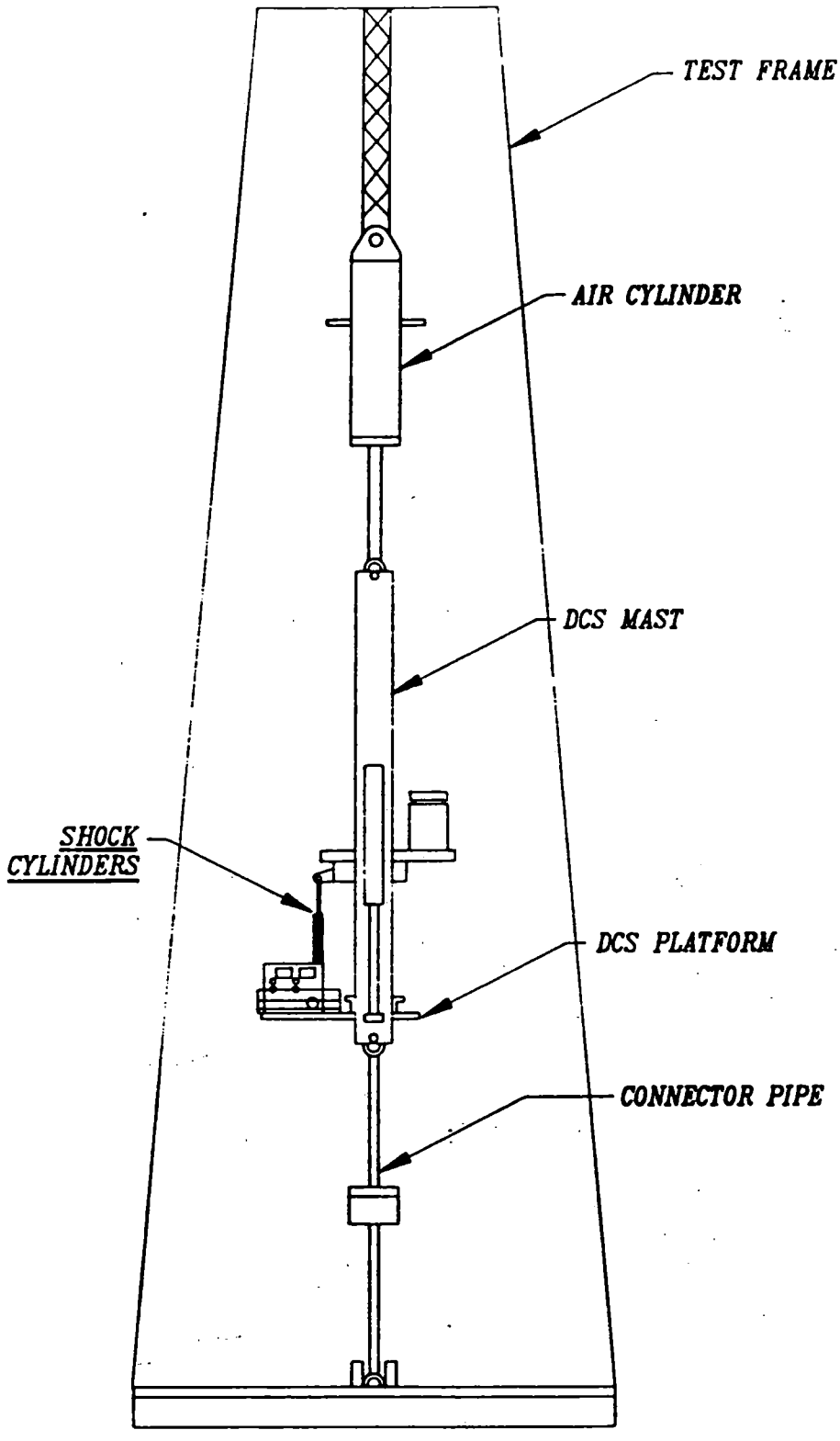


Figure A4

DCS PLATFORM TEST

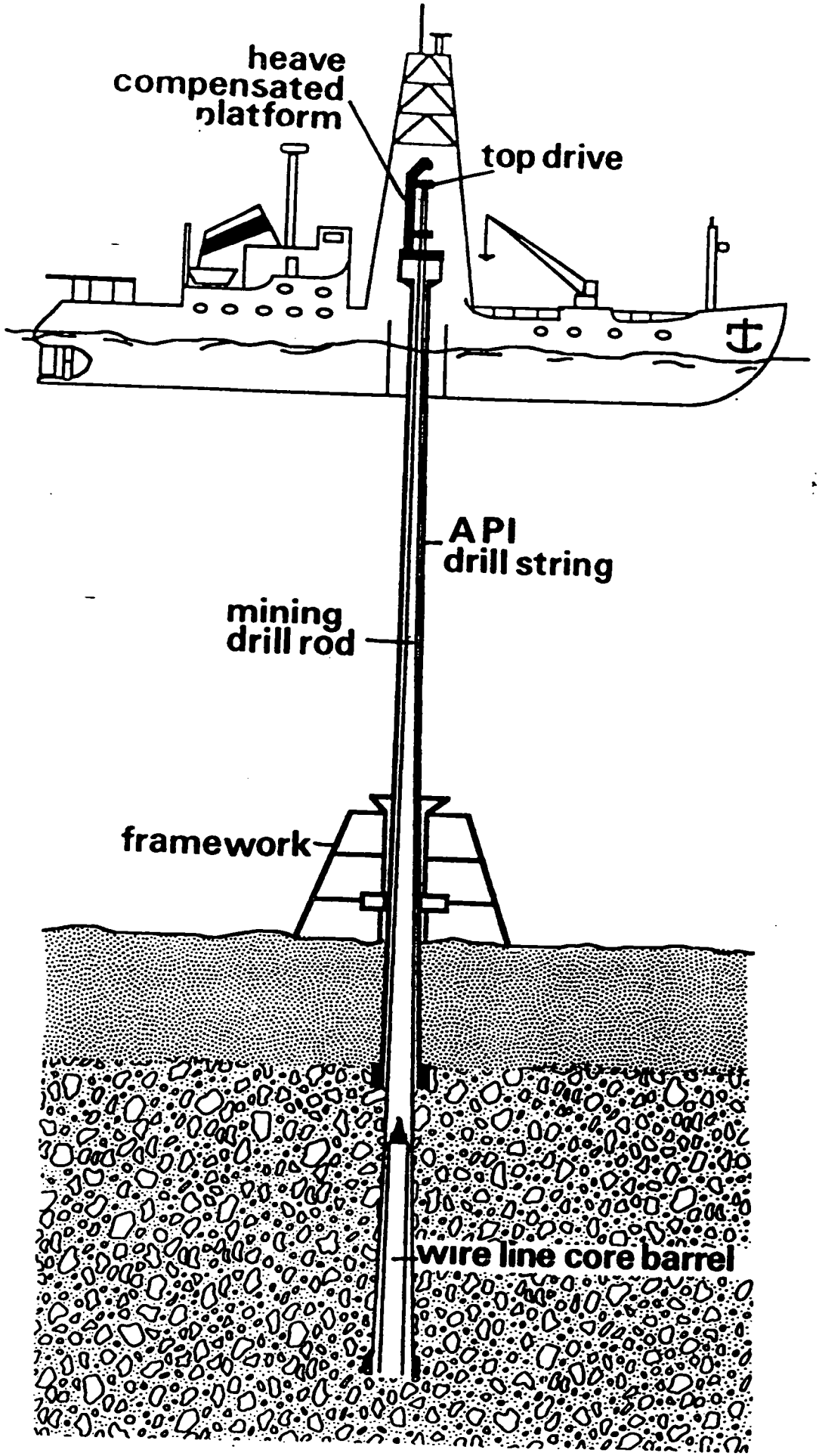


FIGURE 1 - PRINCIPE DU "PIGGYBACK"

Tensioners, stroke and tension

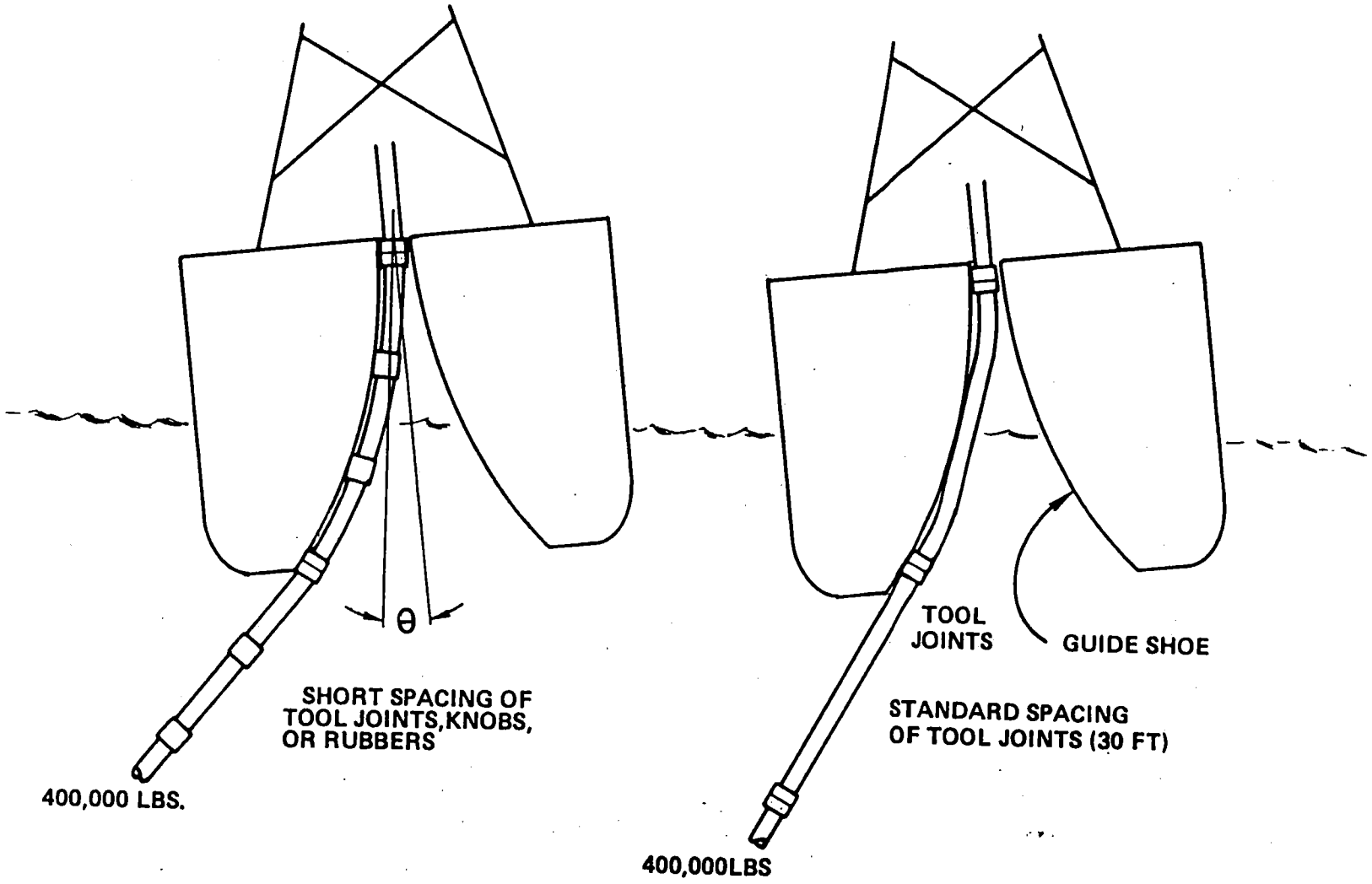


FIGURE 10
DRILL STRING IN GUIDE SHOE

LEG 142 EAST PACIFIC RISE I

LEG MAP

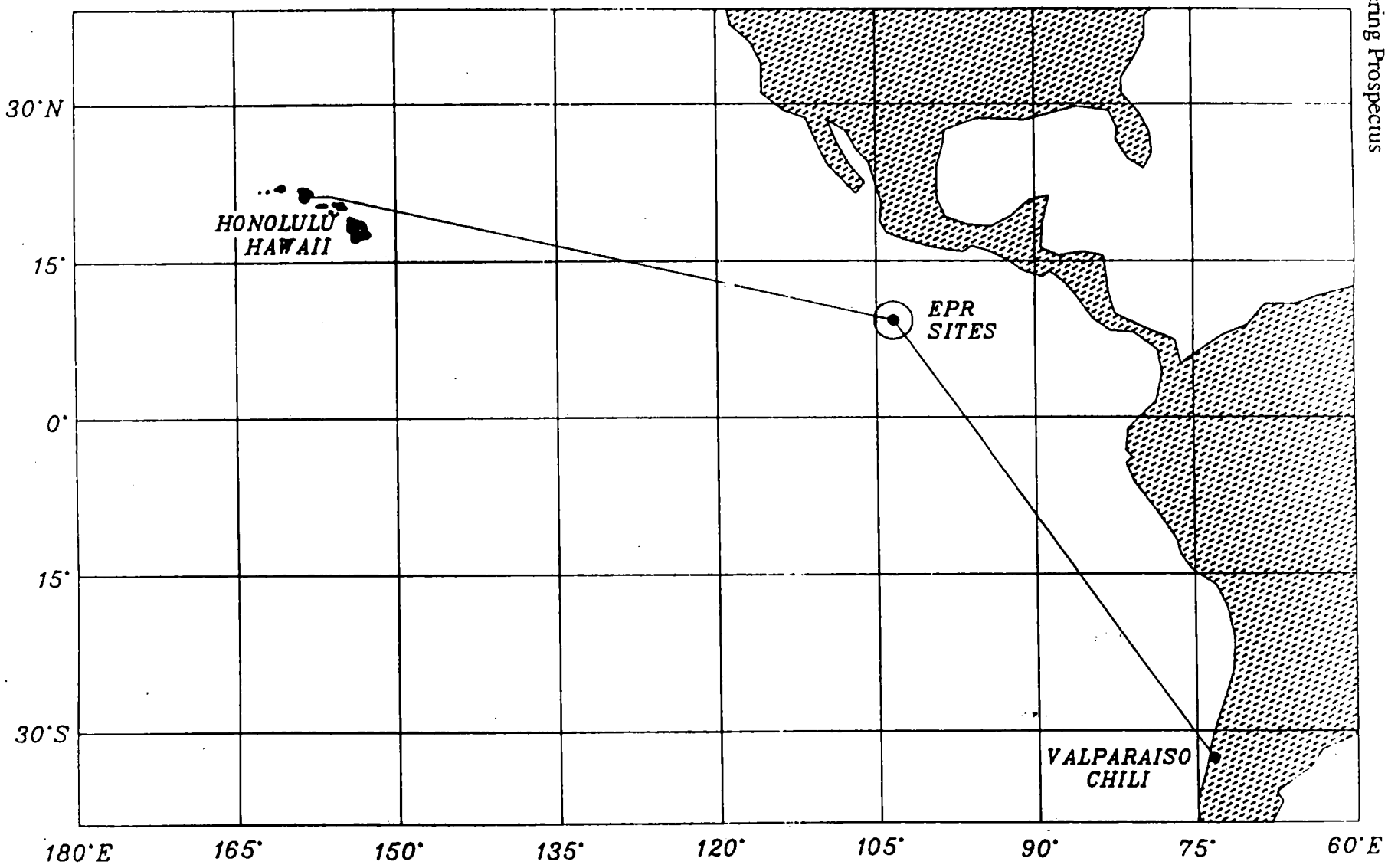


Figure 1

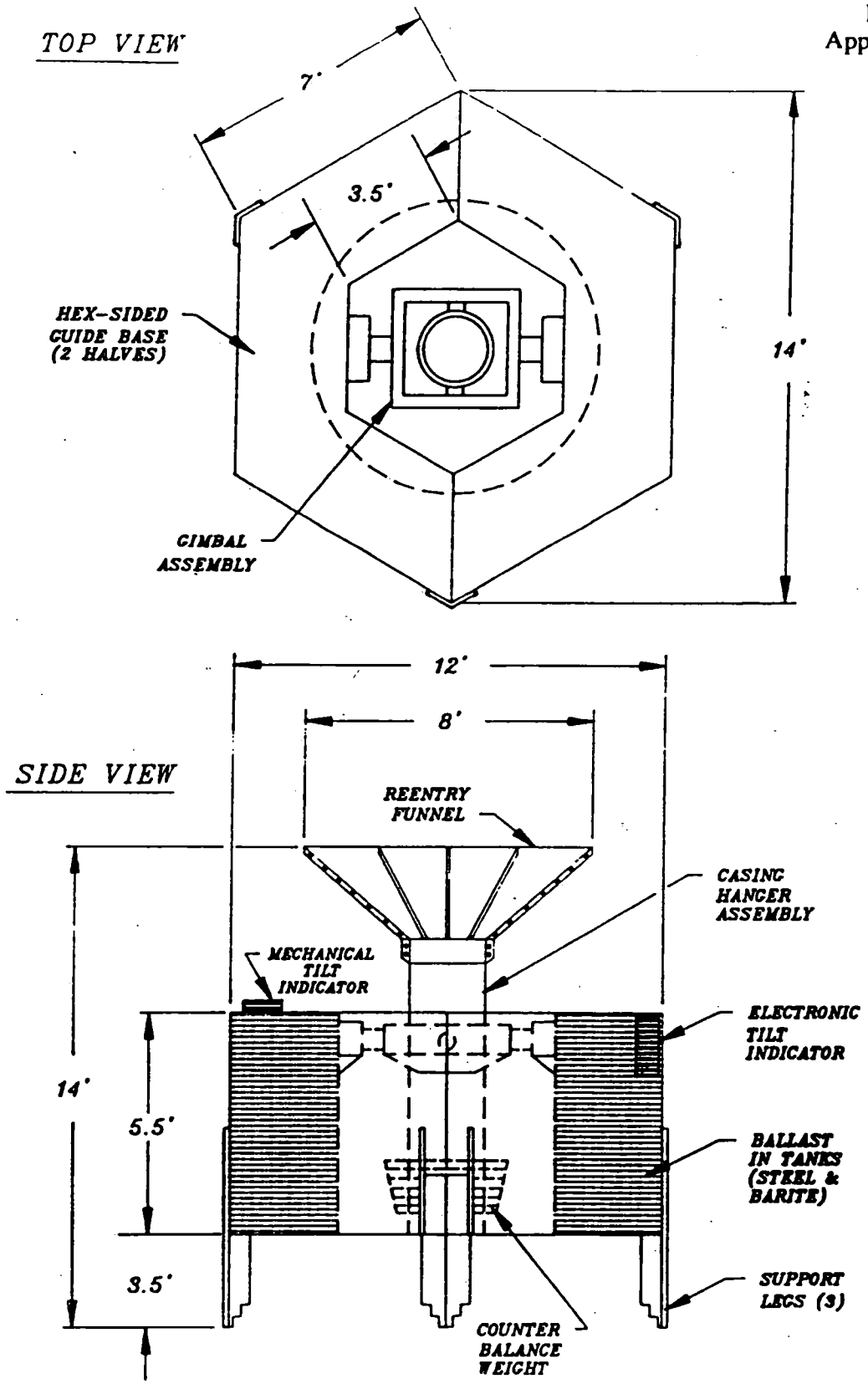


Figure C1

MINI HARD ROCK GUIDE BASE (HRB)

HEXAGONAL DESIGN SCHEMATIC

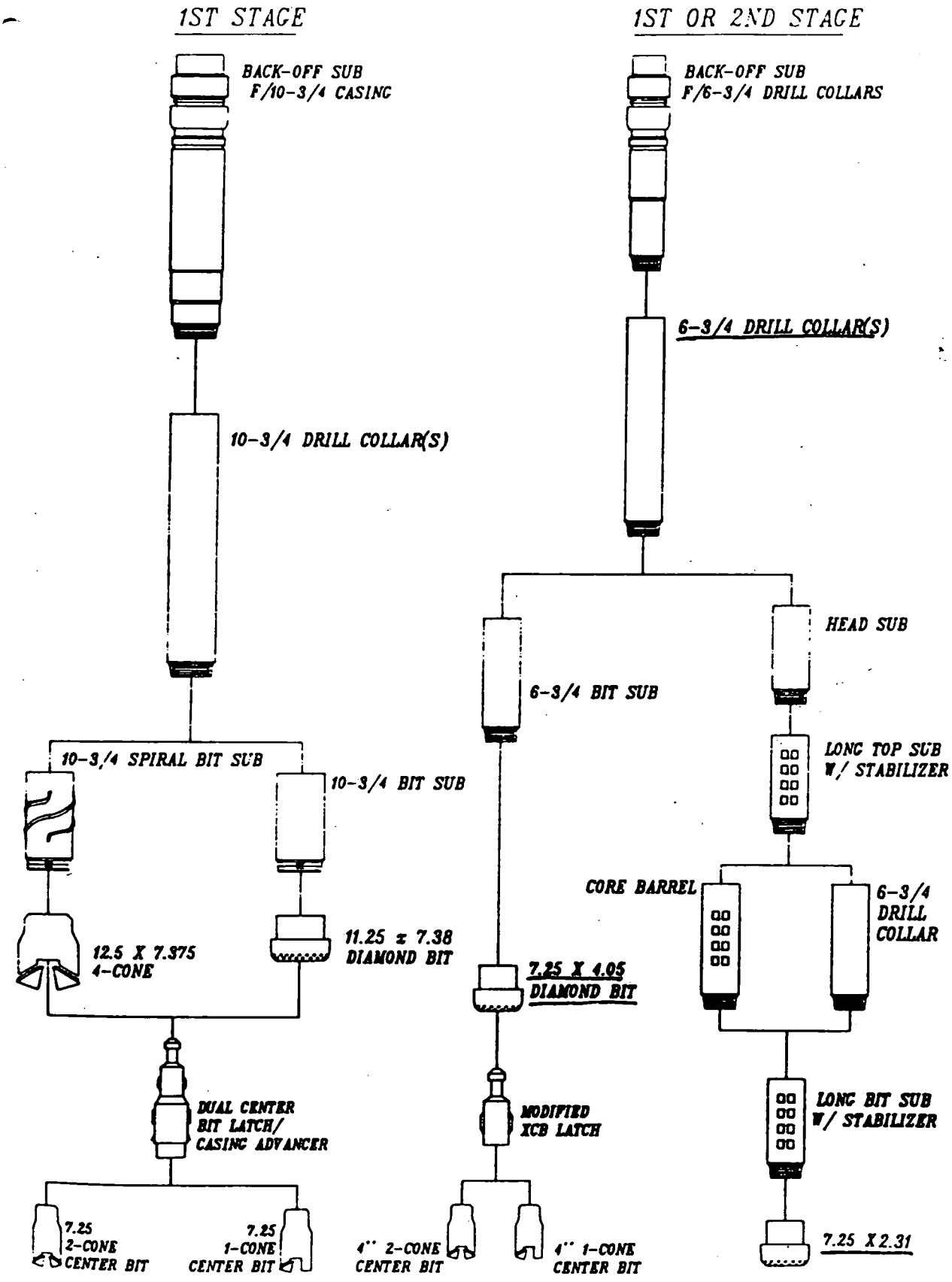


Figure 6

NESTED DRILL-IN BOTTOM HOLE ASSEMBLY

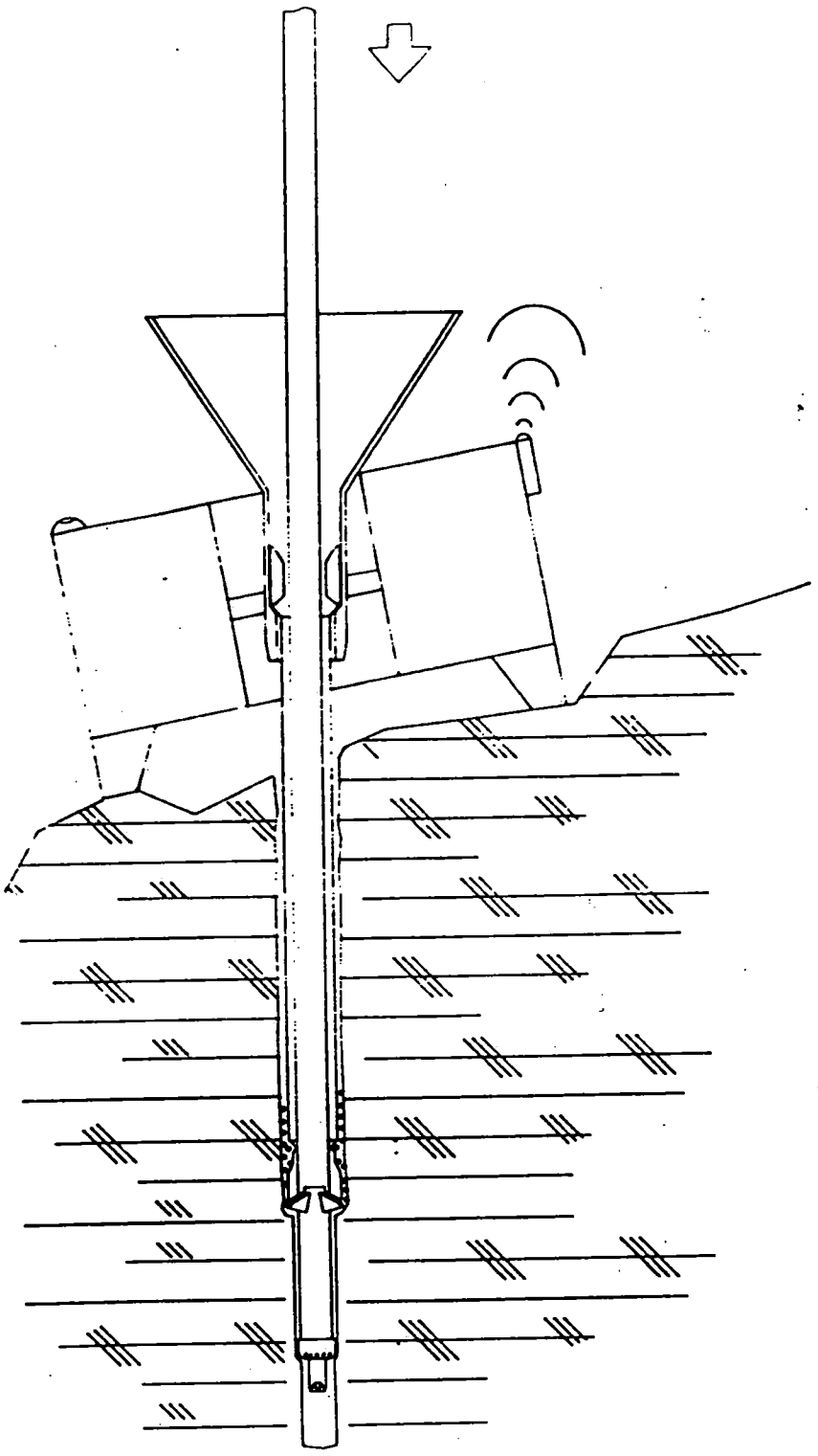


Figure 16

REAM DCS HOLE TO PRE-DETERMINED DEPTH

LEG 142 SECONDARY ENGINEERING OBJECTIVES

Once the DCS coring capabilities have been amply demonstrated, any remaining time will be spent testing other ancillary but complimentary developmental systems. These include the following:

(1) Evaluating the ability to deploy slim hole temperature/caliper logging tools into DCS holes.

(2) Evaluating the ability to ream a nominal four inch DCS hole out to 7-1/4 inches.

(3) Evaluating the ability to maintain adequate hole stability in a reamed DCS hole allowing the deployment of conventional temperature/caliper logging tools.

(4) Evaluating the ability to deploy a second stage DI-BHA through the upper unstable "rubble" hole.

(5) Evaluating the potential of the developmental 7-1/4 inch diamond core barrel (DCB) coring system.

DEEP DRILLING STUDIES

Strategy:

- use outside consultant

Study subjects:

- Drilling scenarios for 'thematic panel sites'
- Explore limits of:

  drilling with riser
  drilling without riser
  mining drilling

Procedure/planning:

- Preparation of RFP (by TAMU)	Oct. '91
- Vetting of RFP (by TEDCOM)	late '91
- RFP to potential consultants	Jan. '92
- Invite consultants to TEDCOM. Designation of chosen consultant by TEDCOM/TAMU. Launch studies.	April '92
Presentation of study results to TEDCOM.	Sept. '92

THEMATIC PANEL DEEP DRILLING SITE DATA

Panel	Site	Comments
TECP	Northern Newfoundland Basin. NB3	water depth: 4000m sediments: 2060m basement: 240m high pore pressures. danger of hydrocarbons
LITHP	Hypothetical	water depth: 4 - 4.5 km penetration: 5 - 6 km potential problems: hole stability, lost circulation, wellbore failure, wall sloughing, hard drilling, stress/temperature problems.
SGPP	Western Somali Basin (proposal No. 061)	water depth: 5000 m sediment: 1500 - 2000 m basement: 10 m rock: calcareous pelagics and distal turbidites. well control required.

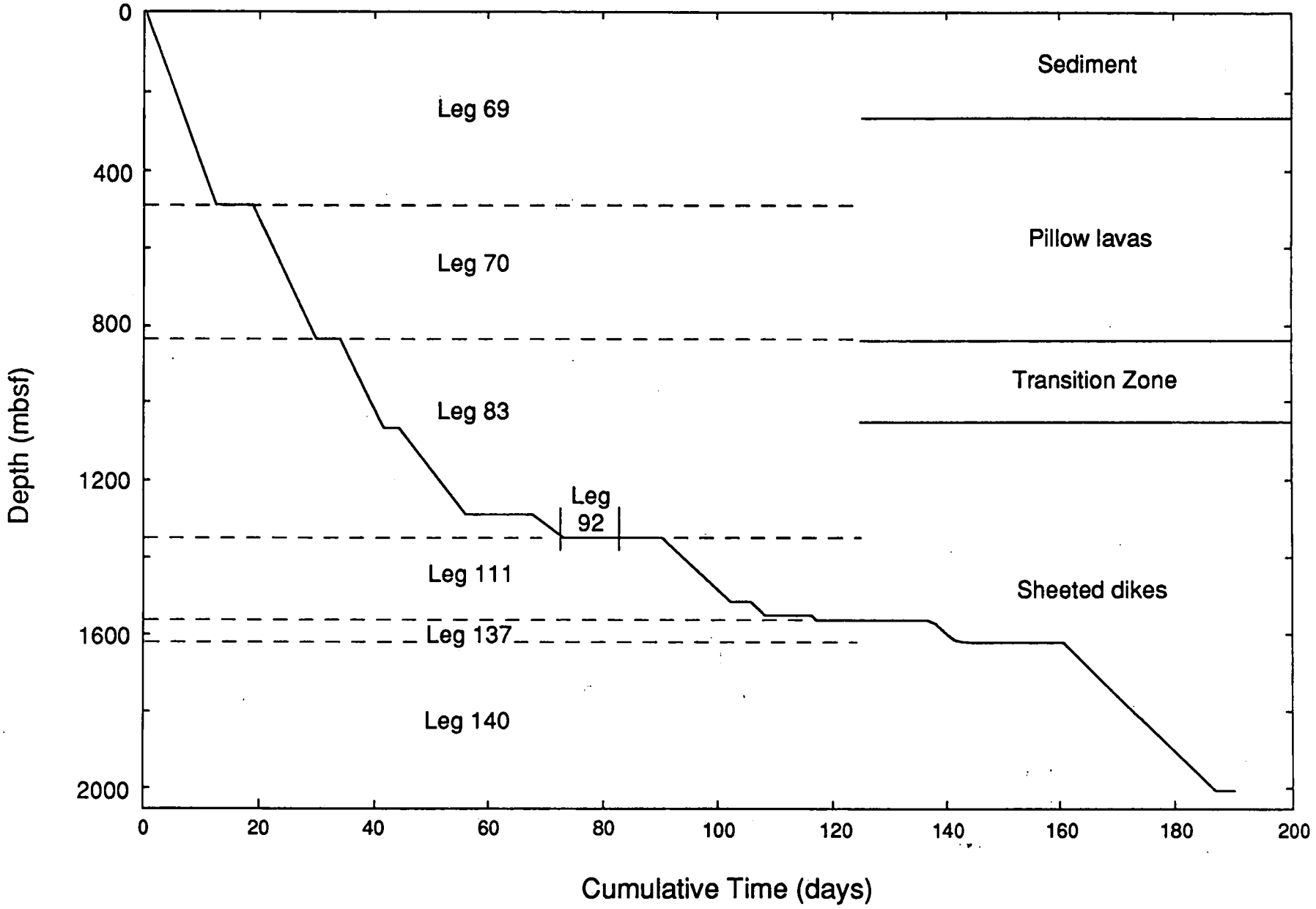
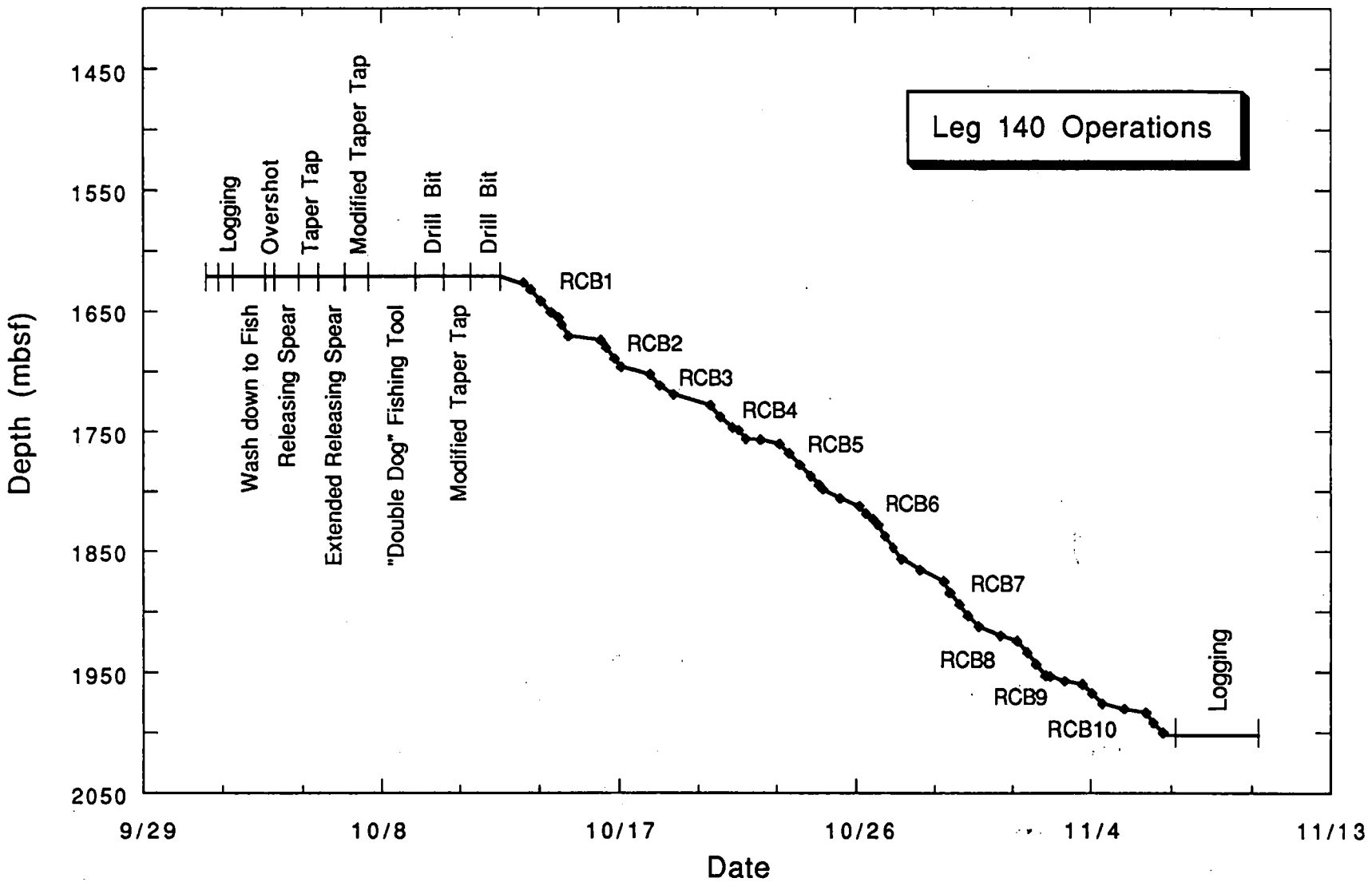

0
400
800
1200
1600
2000
Depth (mbsf)
Leg 69
Leg 70
Leg 83
Leg
92
Leg 111
Leg 137
Leg 140
Sediment
Pillow lavas
Transition Zone
Sheeted dikes
0
20
40
60
80
100
120
140
160
180
200
Cumulative Time (days)

Fig. 504-B-3


Leg 140 Operations
Depth (mbsf)
1450
1550
1650
1750
1850
1950
2050
9/29
10/8
10/17
10/26
11/4
11/13
Date
Logging
Overshot
Taper Tap
Modified Taper Tap
Drill Bit
Drill Bit
Wash down to Fish
Releasing Spear
Extended Releasing Spear
"Double Dog" Fishing Tool
Modified Taper Tap
RCB1
RCB2
RCB3
RCB4
RCB5
RCB6
RCB7
RCB8
RCB9
RCB10
Logging

Hole 504B

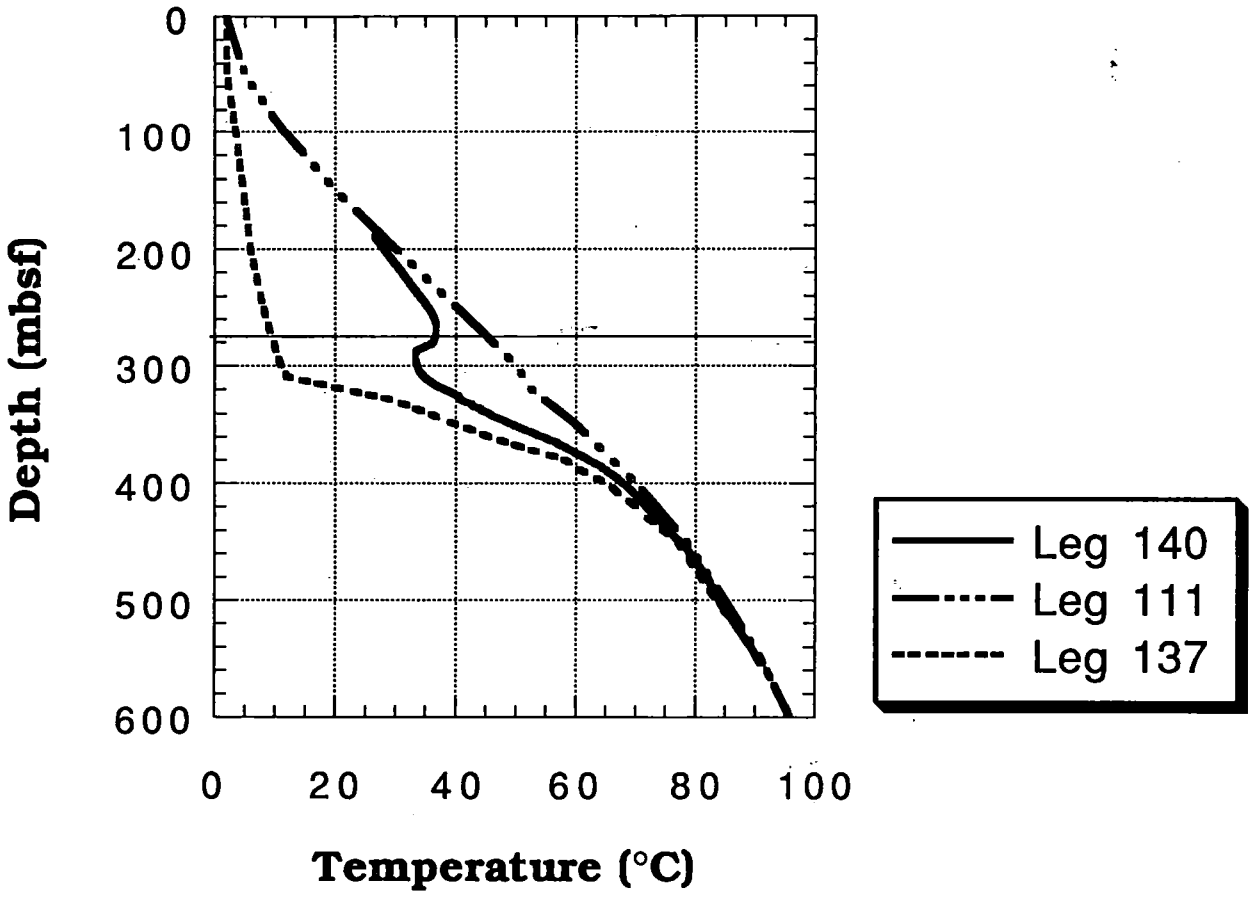

Depth (mbsf)
0
100
200
300
400
500
600
0
20
40
60
80
100
Temperature (°C)
Leg 140
Leg 111
Leg 137

Figure 504-D-10 Classification scheme for crystal clots in oceanic basalts

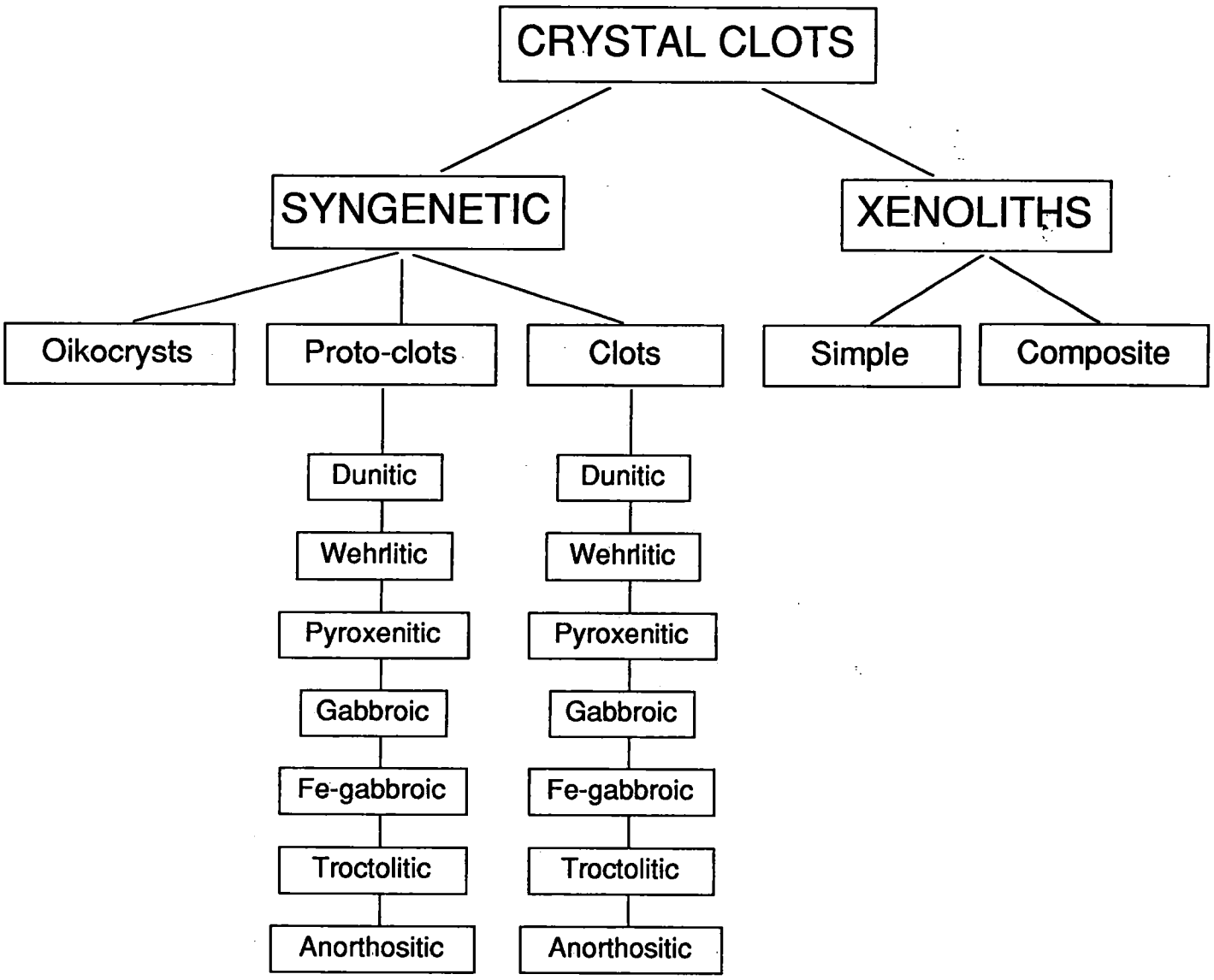


Figure 504-I-2.

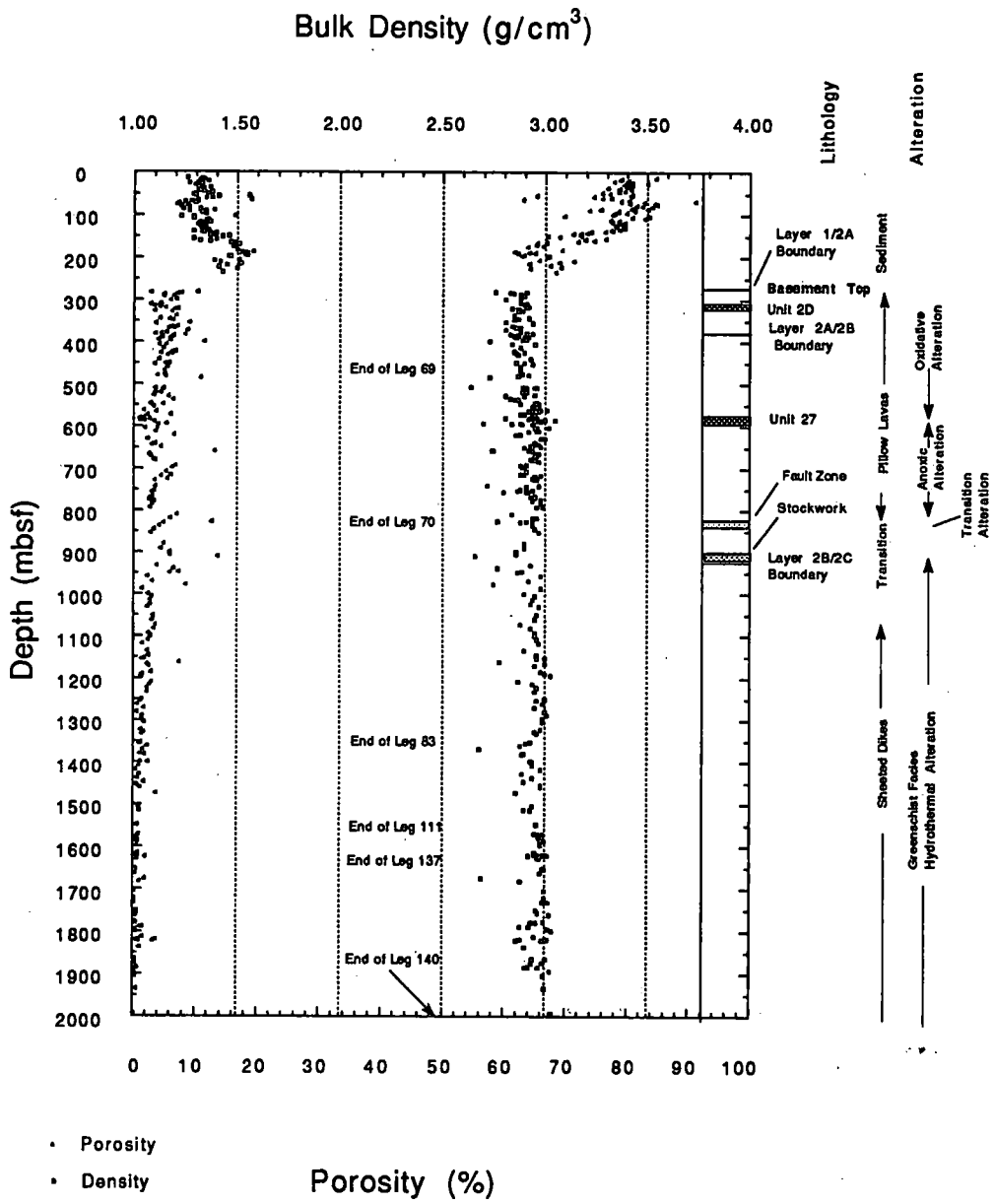
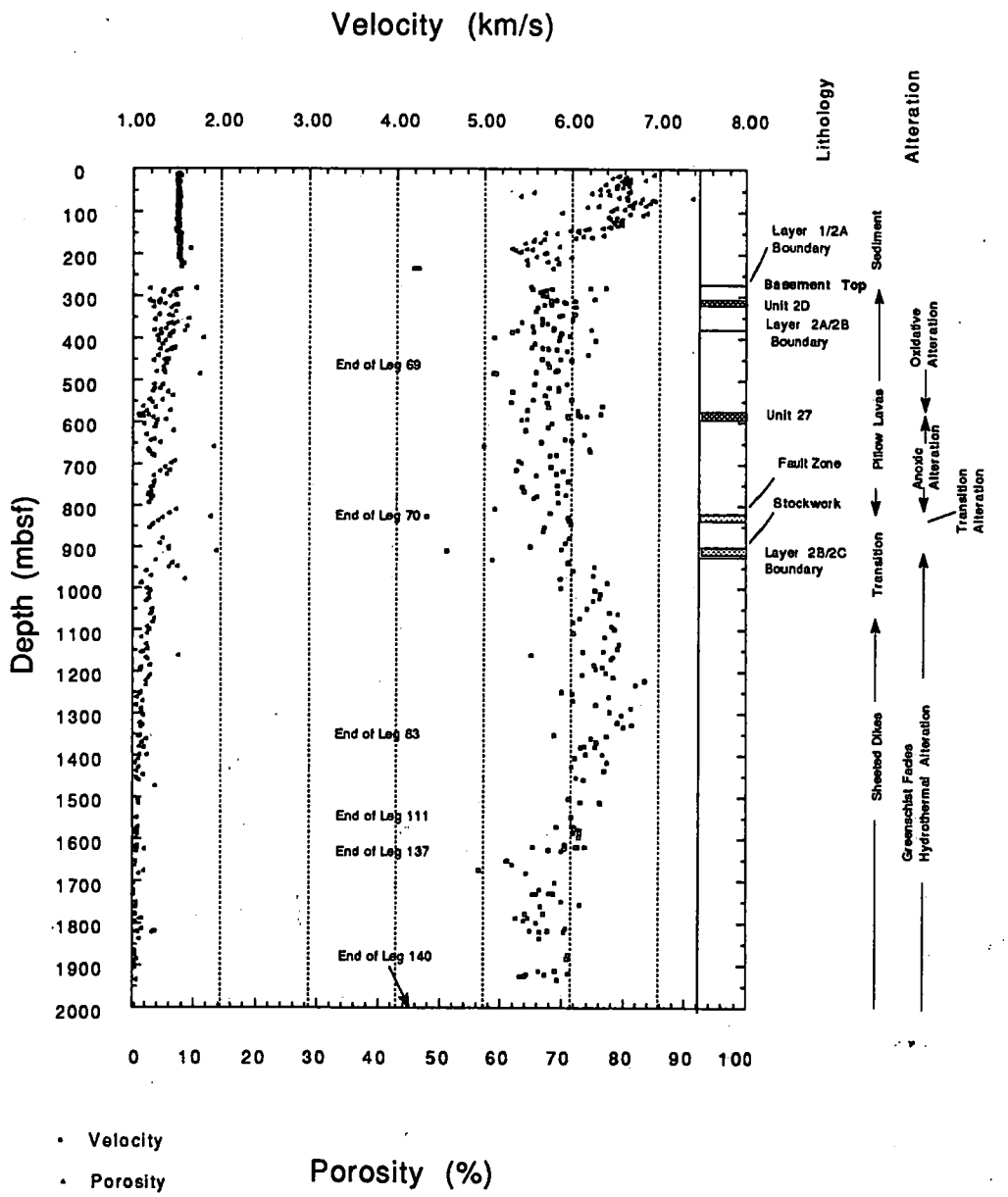


Figure 504-I-4.



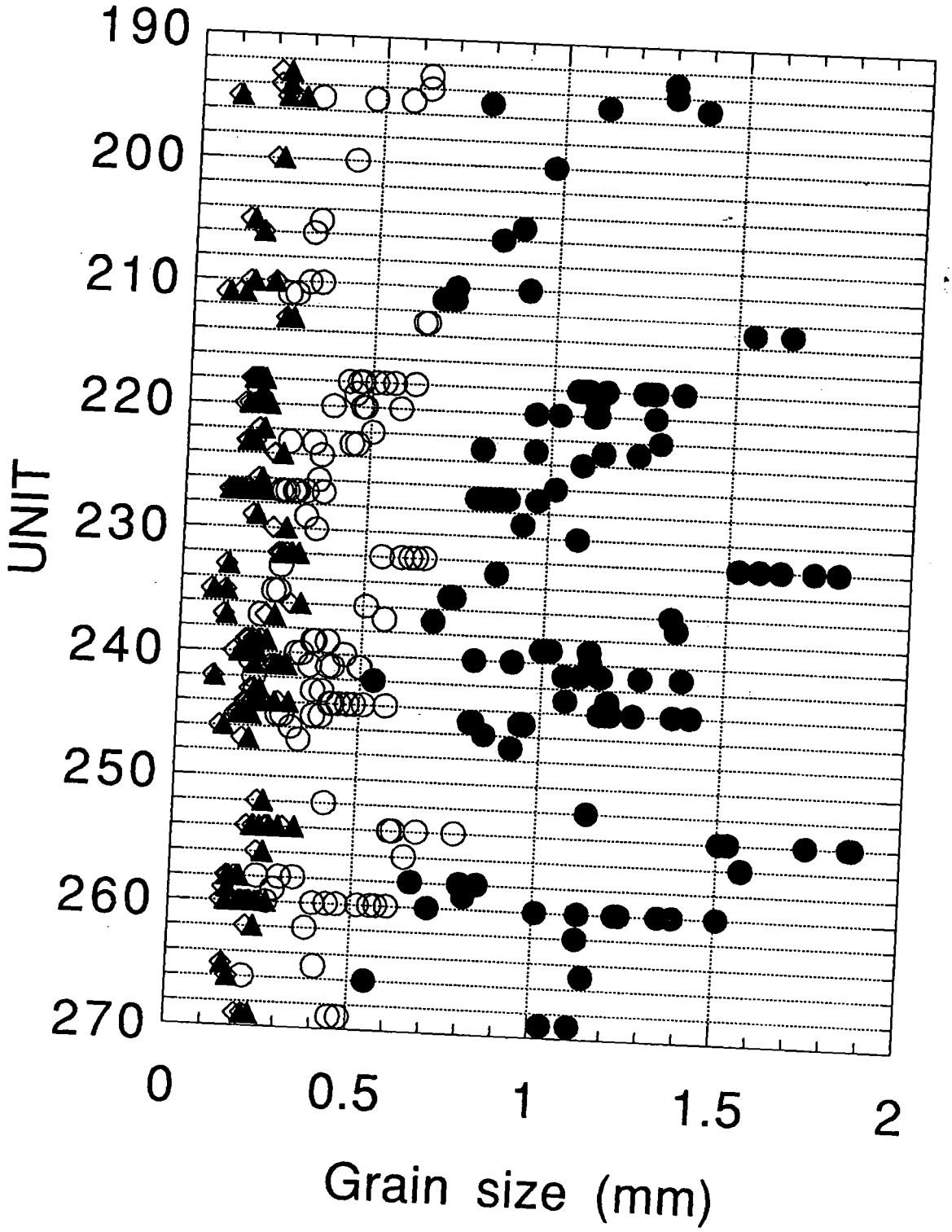
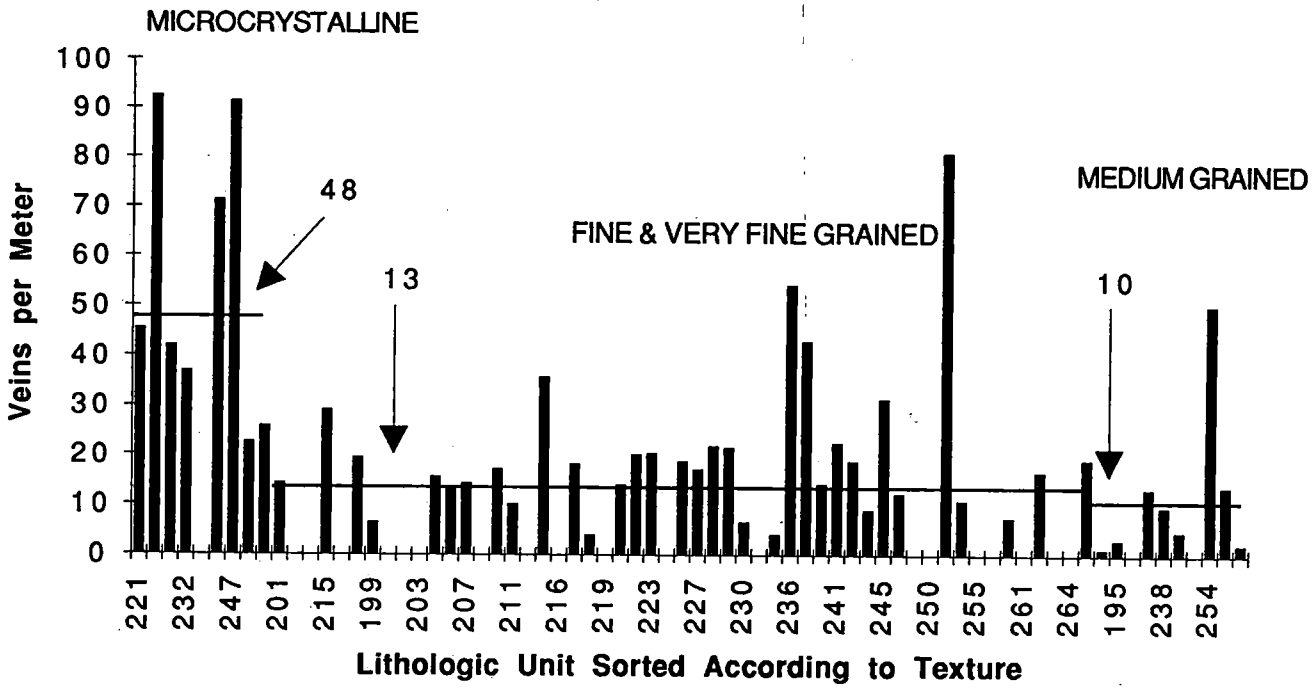
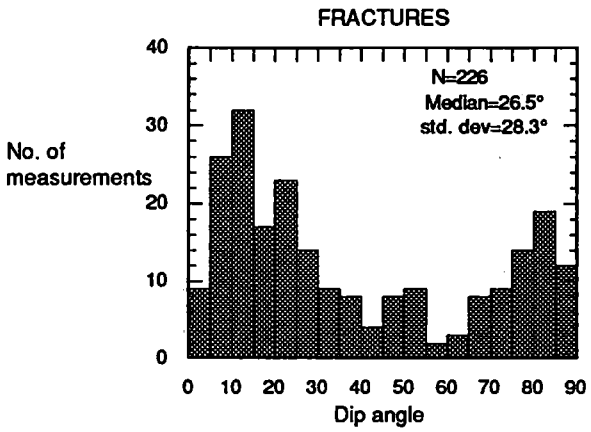
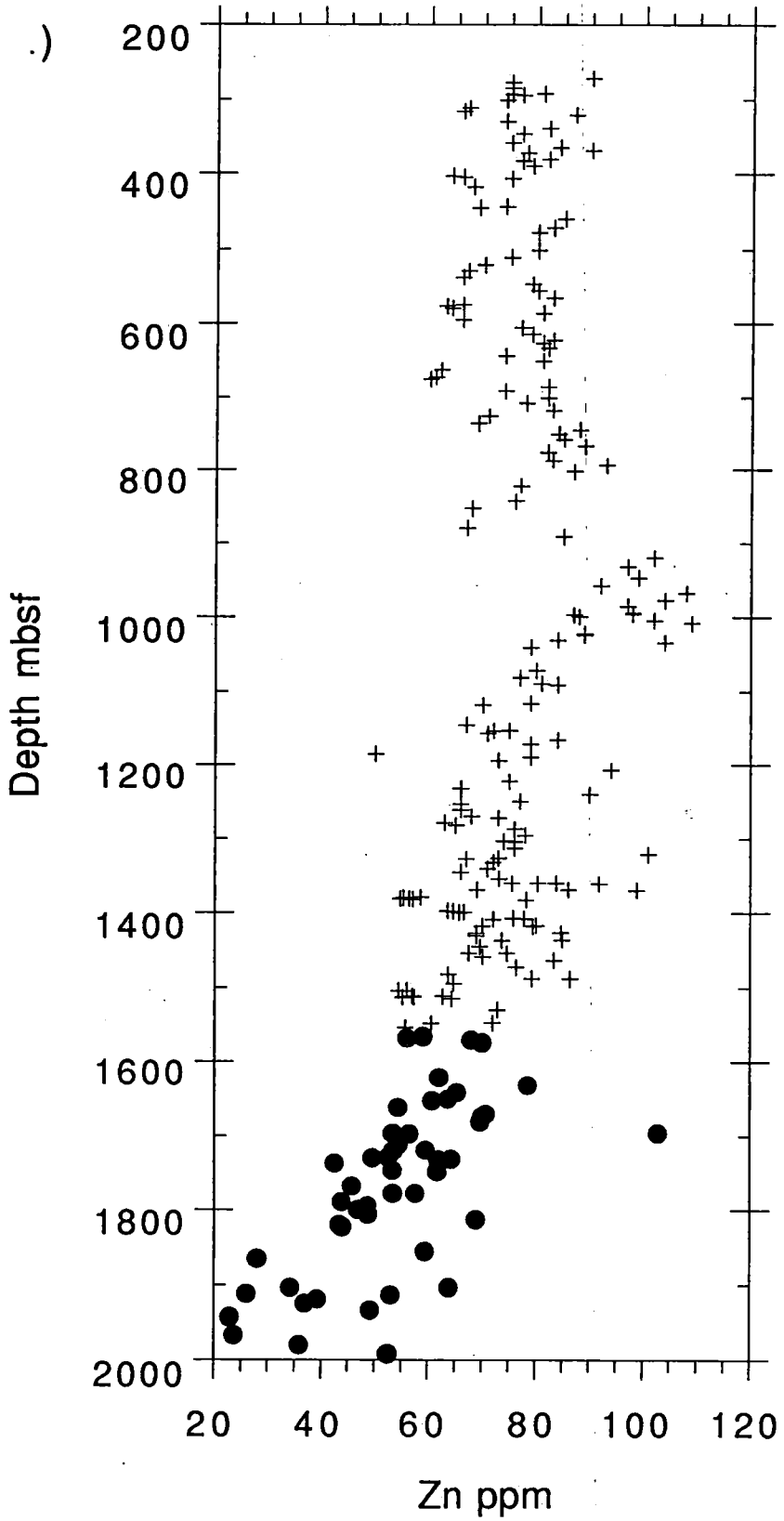

190
200
210
220
230
240
250
260
270
UNIT
0
0.5
1
1.5
2
Grain size (mm)

Figure 504-E-21




FRACTURES
N=226
Median=26.5°
std. dev=28.3°
No. of measurements
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90
Dip angle


.)
200
400
600
800
1000
1200
1400
1600
1800
2000
Depth mbsf
20
40
60
80
100
120
Zn ppm

PANEL CHAIRS' MEETING

MINUTES OF 3 DECEMBER 1991 MEETING
AUSTIN, TEXAS

EXECUTIVE SUMMARY

2.0 ISSUES OF CONCERN

2.1 Ocean History Panel (N. Shackleton)
PANCHM encourage participating countries to set up a clear mechanism for ensuring that an alternate receives an invitation when the designated member is unavailable. Although designated alternates are often able to contribute less, Panel Chairs welcome their presence.

3.0 SUPPLEMENTAL SCIENCE PROPOSALS

The PANCHM recommend that "less-than-a-leg" proposals continue to be an option, even though supplemental science proposals are now discontinued. Incorporation of highly-ranked short proposals into drilling legs will be accomplished through the thematic panels prior to their inclusion in a prospectus for ranking to determine drilling schedules. Projects that are included in the prospectus will already be packaged into one-leg units and each leg will form an integrated program.

4.0 THE PROACTIVE/REACTIVE ROLES OF THE PANEL: REVIEWING PROCEDURES

The Panels are concerned about the dichotomy they face in their roles of actively accomplishing a set of scientific objectives--which may involve them in writing proposals--and their other task of reviewing proposals; this situation can be viewed as a potential source of conflict of interest.

The PANCHM recognize the paramount need for preservation of fairness and openness in the program. There is clearly a potential for conflict of interest for panel members who are proponents. However, excluding panel members from voting and ranking procedures removes areas of expertise from important discussions. Proponents should be clearly identified and not permitted to vote for their own proposals. Panel Chairs should prevent any lobbying activities; consequently, proponents can be asked to leave the room at the discretion of the Chairperson.

Panels will continue to be proactive in soliciting proposals and in encouraging refinement of those proposals that address high priority objectives in order to accomplish the goals of the Panels.

5.0 VOTING AND RANKING PROCEDURES

The PANCHM recommend to the JOIDES Office that the numbers be removed from the ranking boxes on the proposal review forms.

For ranking of prospectus proposals that occurs in the fall, the following guidelines have been put into place:

a) each Panel will decide which of those proposals fall within their mandate and will be included in the ranking (some Panels may include all, others only a few).

b) proposals will be ranked by each Panel member, with the top ranked receiving the highest number of votes (e.g. if there are ten proposals being ranked, then the top choice receives ten points). Proponents will not vote for their own proposal.

c) total scores will then be divided by the number of individuals who were permitted to vote for that proposal.

7.0 PROPOSALS - DEADLINES AND SIZES

PANCHM recommends that the JOIDES Office set the following deadlines for receipt of proposals to be included in the Panels' review processes: 1 January and 1 August. These need to be adhered to by everyone--including the thematic panels.

8.0 MEETING SCHEDULE

The following schedule was set up:

PANEL	SPRING	FALL
Thematic	Late Feb/Early March	Mid-October
SSP	Early April	September
PCOM	Mid-late April	Late Nov-Dec
Activity	Global Ranking/ Drillability Assessment	Prospectus Ranking/ SSP Input from Initial Data

SSP will impose a 1 August deadline for submission of available site survey data for highly ranked global proposals likely to be included in the fall rankings, so they can provide feedback to the Panels for the fall meetings.

9.0 CORE-LOG DATA INTEGRATION

It is currently not possible to cross-correlate core and log data routinely on board the ship.

The service panels will produce an action plan for the effort needed to be presented to PCOM, and the PANCHM will endorse this plan.

12.0 FUNDING FOR PANEL CHAIRS

PANCHM again request an increase in the level of support for expenses provided for Panel-related activities to $2500 per year.

PANEL CHAIRS' MEETING

MINUTES OF 3 DECEMBER 1991 MEETING
AUSTIN, TEXAS

Attending: S. Humphris (LITHP), E. Moores (TECP), N. Shackleton (OHP), J. McKenzie (SGPP), K. Moran (SMP), I. Gibson (IHP), R. Kidd (SSP), L. Garrison (PPSP)

Apologies: C. Sparks (TEDCOM), P. Worthington (DMP)

Guests: J. Austin (PCOM), B. Malfait (NSF), U. von Rad (PCOM), C. Fulthorpe (JOIDES), P. Blum (JOIDES)

1.0 INTRODUCTION

Humphris opened the 1991 Meeting of the Panel Chairpersons by introducing all participants. The proposed agenda was presented, with some additions made, and the decision was made to proceed with each Panel Chair being given the opportunity to present issues of concern that might be relevant to other panels.

2.0 ISSUES OF CONCERN

2.1 Ocean History Panel (N. Shackleton)

There is a concern that non-U.S. members are sometimes not represented at the panel meetings. PANCHM encourage participating countries to set up a clear mechanism for ensuring that an alternate receives an invitation when the designated member is unavailable. Although designated alternates are often able to contribute less, Panel Chairs welcome their presence.

2.2 Tectonics Panel (E. Moores)

TECP presented four areas of concern:

a) Breadth of charge--many proposals suffer from a lack of emphasis on tectonic issues, making them less attractive to the Panel. TECP is addressing this by appointing watchdogs for those proposals that are of potential interest.

b) Cost and consequences of short lead time on receipt of prospectuses and proposals--the cost of photocopying and postage of materials for meetings is now beyond the funds allotted to Panel Chairs for the task. This is made more difficult in that materials are received so late that they have to be sent by overnight mail or carrier. During the last meetings, some panel members were already on the road and did not receive their packages.

c) Secretarial support--E. Moores applied to USSAC for funds to support a part-time secretary to help with Panel Chair's tasks; however, he was sent back to PCOM.

d) Rotation of foreign members--international partners should attempt to follow the same rotation rules as the U.S.

The joint LITHP-TECP meeting was considered very successful in improving communications between the two panels, and should be considered by others.

2.3 Lithosphere Panel (S. Humphris)
Most items of concern were included on the agenda; of particular interest to LITHP are:

a) The role of the panels--are they proactive (writing and soliciting proposals) or reactive (reviewing proposal)?

b) The timing of the creation of WG and DPGs--the impact on the North Atlantic prospectus.

c) Deep drilling--can the panels help advance the proposed feasibility study?

2.4 Sedimentary Geochemical Processes Panel (J. McKenzie)
Four items were presented:

a) SGPP had problems with voting procedures related to concerns over conflict of interest, and in attempting to have its broad mandate thematically reflected in its global rankings.

b) Because of their broad perspective, SGPP reviews almost every proposal that is submitted. This means that much of their time is spent reviewing, and very little in substantive discussion of the science and the Panel's directions. Austin reported that he was not averse to longer Panel meetings if they are necessary.

c) SGPP is very concerned about logging and sampling capabilities and their impact on achievement of their Panel's objectives.

d) SGPP feels that attendance at panel meetings of liaisons from other panels is very important for maintaining communications. Whereas liaison between SGPP and TECP and LITHP is excellent at present, better liaison between SGPP and OHP is needed.

2.5 Site Survey Panel (R. Kidd)
SSP has one major concern that will be presented to PCOM at the meeting, plus two minor items for Panel Chairs:

a) Leadtime to review data for scheduled legs--at their last meeting in Tokyo, SSP had no data to review for the programs that will be included in the FY'93 drilling. This is a major problem as the Panel cannot advise PCOM on the readiness of these programs for drilling. Consequently, they will ask PCOM to define back-up legs for FY'93 with the proviso that site survey data must be submitted to SSP by 1 March for the April meeting so that they can review it before the leg is firmly scheduled. This puts the onus on the proponents to get the data submitted.

b) Scheduling of panel meetings--the thematic panel meetings need to be coordinated with SSP meetings so that information can be passed to PCOM in a timely fashion. Panels need to consider the question of maturity (in terms of available data) when doing the global rankings in the spring.

c) Liaison to the offset drilling working group--this will be requested by SSP.

2.6 Shipboard Measurements Panel (K. Moran)
Three issues that were included in the agenda are:

a) The need for more technical support on the ship--this was proposed last year and needs further discussion.

b) Core-log data integration--input from the other Panels is needed as to the desirability of this capability.

The need for better communication between SMP and future Co-Chief Scientists was stressed. During Leg 139, issues concerning shipboard measurements were addressed early because one of the Co-Chief Scientists (M. Mottl) was an SMP member.

There is currently no long-term plan for shipboard measurements. SMP requested input from thematic panels as to what measurements are needed or need to be improved. Thematic panels need to look at legs that are scheduled and flag those that will have special measurements requirements so that SMP can begin to address them with enough lead time.

SMP is particularly concerned over the status of downhole sampling tools. Better coordination is needed with DMP to ensure that these tools do not fall through the cracks. This could be the function of the liaison to DMP.

2.7 Information Handling Panel (I. Gibson)
The major concern of IHP is that data handling on board ship has some severe problems that need to be addressed. There is more data being collected and there is no overall plan for computing on board. This is becoming so serious that it will soon impact on the science that can be done at sea. IHP has recommended that a WG be set up to look at the problem--both at sea and on shore.

2.8 Pollution Prevention and Safety Panel (L. Garrison)
PPSP had no additional agenda items.

3.0 SUPPLEMENTAL SCIENCE PROPOSALS

Since supplemental science proposal submission has been discontinued, PANCHM addressed the issue of how to incorporate "less-than-a-leg" proposals so that the option of proposing smaller projects remains open. It is critical that "less-than-a-leg" proposals be built into any drilling programs in the planning stages. In addition, programs that make their way into a prospectus should already be packaged into one-leg units. "Less-than-a-leg" proposals should be encouraged and should go through the regular ODP review process. However, it is up to thematic panels to accomplish the integration of proposals into individual legs. Proponents of these short proposals must be aware of, and meet, all the site survey requirements. For opportunities to deepen or log an existing hole, this may not present problems for SSP, but may have implications for PPSP as drilling is often approved only to a certain depth.

The PANCHM recommend that "less-than-a-leg" proposals continue to be an option, even though supplemental science proposals are now discontinued. Incorporation of highly-ranked short proposals into drilling legs will be accomplished through the thematic panels prior to their inclusion in a prospectus for ranking to determine drilling schedules. Projects that are included in the prospectus will already be packaged into one-leg units and each leg will form an integrated program.

4.0 THE PROACTIVE/REACTIVE ROLES OF THE PANEL: REVIEWING PROCEDURES

The Panels are concerned about the dichotomy they face in their roles of actively accomplishing a set of scientific objectives--which may involve them in writing proposals--and their other task of reviewing proposals; this situation can be viewed as a potential source of conflict of interest. However, actions such as excluding proponents totally from the voting and ranking process can result in an imbalance of discipline expertise in areas where it is critical to the discussion. It is also likely

that, if the panel members are selected on the basis of their interest in drilling and their area of research, they are the ones who will be interested in writing proposals. Consequently, the following recommendation is made to PCOM:

The PANCHM recognize the paramount need for preservation of fairness and openness in the program. There is clearly a potential for conflict of interest for panel members who are proponents. However, excluding panel members from voting and ranking procedures removes areas of expertise from important discussions. Proponents should be clearly identified and not permitted to vote for their own proposals. Panel Chairs should prevent any lobbying activities; consequently, proponents can be asked to leave the room at the discretion of the Chairperson.

Panels will continue to be proactive in soliciting proposals and in encouraging refinement of those proposals that address high priority objectives in order to accomplish the goals of the Panels.

5.0 VOTING AND RANKING PROCEDURES

The Panels decided to try to standardize the ranking and voting procedures for at least the fall prospectus rankings. Of initial concern was the lack of correlation between the ranking a proposal receives, and the "grade" it receives on the review form. The review form rankings address specifically the relevance of a given proposal to a thematic panel plus, to some extent, the deficiencies in that proposal (this has some relation to its maturity and level of interest). In order to avoid the rankings being interpreted as being from "poor" to "excellent":

The PANCHM recommend to the JOIDES Office that the numbers be removed from the ranking boxes on the proposal review forms.

In terms of the voting and ranking procedures, Panels will continue to use their own procedures for the global ranking that takes place in the spring. However, Panels will also provide some indications of which programs they believe to be drillable in the near future. SSP can then begin to look at the appropriate site survey information of the legs that may get scheduled for drilling in the next year to be ranked at the fall meetings.

For ranking of prospectus proposals that occurs in the fall, the following guidelines have been put into place:

a) each Panel will decide which of those proposals fall within their mandate and will be included in the ranking (some Panels may include all, others only a few).

b) **proposals will be ranked by each Panel member, with the top ranked receiving the highest number of votes (e.g. if there are ten proposals being ranked, then the top choice receives ten points). Proponents will not vote for their own proposal.**

c) **total scores will then be divided by the number of individuals who were permitted to vote for that proposal.**

6.0 TIMING OF THE CREATION OF WORKING GROUPS AND DETAILED PLANNING GROUPS

LITHP is disappointed that their request for formation of an Offset Drilling Working Group (which was supported by TECP) was put off for a year by PCOM. The impact of their decision was clear from the North Atlantic prospectus, which included a highly detailed report from the NARM-DPG, while the OD-WG effort is still in the preliminary stages. Austin informed the Panel Chairs that PCOM often has to phase the formation of both Working Groups and Detailed Planning Groups.

7.0 PROPOSALS - DEADLINES AND SIZES

Two interrelated issues concerning deadlines were addressed:

a) deadlines for proposals to ensure timely submission to Panel Members for review

b) scheduling of meetings in a logical order to increase the flow of information between thematic and service panels.

PANCHM recommends that the JOIDES Office set the following deadlines for receipt of proposals to be included in the Panels' review processes: 1 January and 1 August. These need to be adhered to by everyone--including the thematic panels.

After discussion of whether to impose limits of the length of drilling proposals, the decision was made not to do so at the present time. Proponents should be able to include all the information they feel is pertinent, and documentation might be sacrificed in place of narrative.

8.0 MEETING SCHEDULE

PANCHM are concerned that the North Atlantic prospectus contains proposals that are not ready for inclusion in the FY'93 drilling. They recommend that the thematic

panels in their spring meetings, when generating a global ranking, mark those proposals that are ready to be included in a prospectus for scheduling in the next FY, and that the JOIDES Office should not include in a prospectus proposals that are not regarded as ready.

The following schedule was set up:

PANEL	SPRING	FALL
Thematic	**Late Feb/Early March**	**Mid-October**
SSP	**Early April**	**September**
PCOM	**Mid-late April**	**Late Nov-Dec**
Activity	**Global Ranking/ Drillability Assessment**	**Prospectus Ranking/ SSP Input from Initial Data**

SSP will impose a 1 August deadline for submission of available site survey data for highly ranked global proposals likely to be included in the fall rankings, so they can provide feedback to the Panels for the fall meetings.

Panels will attempt to switch to this new schedule starting in the spring of 1992.

9.0 CORE-LOG DATA INTEGRATION

It is currently not possible to cross-correlate core and log data routinely on board the ship. The service panels have been pushing ODP to begin shipboard integration of core and log data; they have been responsive, and it was tried to a limited extent on Legs 134 and 138. However, a concerted effort is now needed to make this routine. There has been a group that has looked at this problem and issued a report. OHP feels that this will be the most important resource for them over the next few years.

The service panels will produce an action plan for the effort needed to be presented to PCOM, and the PANCHM will endorse this plan.

10.0 SERVICE AND THEMATIC PANEL LIAISONS

In general, these seem to be working well; however, there are a few instances where specific action needs to be taken. For example, SMP has requested a liaison from SGPP once a year. Although there are no formal liaisons between SSP and the other Panels, SSP will interact through the new scheduling procedures described above. SGPP also needs better liaison with OHP.

11.0 SHIPBOARD TECHNICAL SUPPORT

Last year, SMP proposed that 4 FTE be added to the shipboard technical support staff because all their time is spent in maintaining the status quo and they are unable to spend time improving and advancing the capabilities. This impacts the size of the scientific staff and, with another international partner added, this compounds the problem. The Co-Chief Scientists for a given leg have some say in the scientists selected. The JOIDES Office will tell the Co-Chiefs that they need to be aware of the technical staff requirements for their leg, and should look for technical expertise in the scientists they invite, so that some of the technical burden can be taken by the scientific party.

12.0 FUNDING FOR PANEL CHAIRS

The level of support to the Panel Chairs has not changed for many years. It now costs approximately $1000 per meeting for photocopying and mailing expenses. Although the new earlier deadlines will help alleviate the mailing costs, additional expenses are incurred throughout the year for communications.

PANCHM again request an increase in the level of support for expenses provided for Panel-related activities to $2500 per year.

The level of secretarial support that is required for this position is 20% (i.e. one day a week). Among the international members who are Panel Chairs, NERC (UK) covers a part-time secretary for two half-days per week on SSP, and the SGPP Panel Chair has a graduate assistant for 2 hours per week.

13.0 DEEP DRILLING

TEDCOM is now in the process of setting up a task force consisting of deep drilling experts to advise them on generating an RFP for a feasibility study on deep drilling. PANCHM would like to help move this process along, and are willing to provide liaisons from their Panels to assist in this feasibility study.

14.0 LOGGING AND SAMPLING

Many of the Panels have provided lists of tool development that they would like to see happen in order to meet their objectives. These need to be combined into a prioritized short list and sent to PCOM for their support and action. The most appropriate meeting for PCOM to address this issue is at the spring meeting, when the longer term plans are being discussed. Consequently, the Panels will circulate

their lists to each other for discussion at their next meetings and will come to a consensus for a short list to be presented to PCOM.

When making their global rankings, each panel will endeavor to make a list of the downhole measurements that will be needed.

14.0 MEETINGS IN COLLEGE STATION

Austin urged all Panel Chairs to consider an occasional meeting in College Station. Since many of the problems seem to be ones of communication, such meetings would improve interaction between the thematic panels and the Science Operator.

LITHOSPHERE PANEL ANNUAL REPORT
December 1991
Austin, Texas

LITHP met twice in the last year: once in March in La Jolla, CA, and then in October in Nicosia, Cyprus, where we held a joint session with TECP.

1. Planning Activities

Last year I reported that two approaches are necessary to begin to address the LITHP's long-term goals presented in our 1988 White Paper: one is to continue planning towards developing the capacity to drill deep so that we can obtain a complete crustal section, and the second is to begin a program of offset drilling. Some progress has been made in both areas:

a. Deep Drilling - LITHP believes that it is ultimately critical to drill deep holes at a number of sites in order to understand lithospheric processes. It is likely that 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.

In order to push technological developments towards deeper capabilities, at the spring meeting we decided that LITHP's **short-term strategy** will include drilling a scientifically sound program of intermediate (2-2.5 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.

We are now seeing proposals and programs that are being considered for drilling in the near future that begin to answer this need (eg. some of the rifted margin sites and some of the offset drilling proposals).

At the same time as adopting this short term strategy, we continue to work towards the goal of deep (4-6 km) drilling. At the spring meeting, at the request of the Chairman of TEDCOM, we took our original six "example" sites and narrowed them to a single "ocean crust" site using information from Holes 504B and 735B. This site was submitted to TEDCOM.

LITHP is also pleased that some OPCOM funds have been designated for a feasibility study of deep drilling. For our planning purposes, it is critical to know whether a goal of a continuous section through the oceanic crust is realistic in terms of time, technology and cost.

LITHP is interested in seeing this study evaluate the time, technology and cost of drilling: i) a 4 km hole, ii) a 6 km hole in oceanic crust. We have also designated one panel member--Dan Moos--to act as our liaison and to be available to assist in answering questions or providing information to the consultants whenever required.

b. Offset Drilling - at the last annual meeting, LITHP urgently requested 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 those goals. The Panel was very disappointed that PCOM chose to delay formation of this group until its spring meeting. The WG has now met once and will meet twice more. The consequence of this delay is that the WG has only just begun its deliberations at a time when Atlantic drilling is being scheduled, whereas other programs involving Atlantic drilling have been given considerable attention.

In light of this, LITHP has recommended that the OD-WG be specifically charged with developing an initial drilling strategy for the Atlantic and laying out a provisional schedule for Atlantic drilling at its next meeting. This may require both an extra day of meetings, plus involvement of those proponents with interests specifically in the Atlantic. This in some ways turns the WG more into DPG, but we feel that, rather than form an additional group, this need can be addressed under the WG's mandate.

LITHP is pleased that development of the DCS system is the top priority for OPCOM funds, as the system is urgently needed in order to accomplish many of LITHP objectives, in particular drilling through the upper layers of the crust. However, it is now clear from the success of Leg 139 that some of our objectives, in this case initial exploration of hydrothermal systems, can be attained with standard drilling procedures. We look forward to drilling at Hess Deep as an opportunity to demonstrate that drilling in the lower layers can also be accomplished.

2. Supplemental Science

LITHP has strong interests in two of the supplemental science proposals. PCOM specifically charged us to delineate the drilling we would give up in order to accomplish these objectives.

In the case of logging 801C--LITHP supports its inclusion in Leg 144 and is willing to give up 3.5 days of basement drilling to accomplish the logging program. However, the Panel does not want to give up planned basement drilling at MIT-1 because of our interest in getting enough inclination data to average out secular variations and also recovering a number of flows to define geochemical composition and variations. I now understand that the Co-Chiefs have made some changes to the drilling program which includes reducing basement penetration by 100 m at MIT-1. I do not believe there are now 3.5 days left of basement drilling. However, LITHP believes the basement objectives at MIT-1 are important and at least 200 m of penetration needs to be planned.

In the case of OSN-2--LITHP has as one of its goals the establishment of global seismic arrays and has stated that installation of new observations needs to be an integral part of the implementation plan for the ODP Long Range Plan.

In reviewing this proposal, we have been plagued by varying time estimates--when we first reviewed it the estimate was 4 days; when we discussed it at our fall meeting it was up to ten days; it is now back down to 5.7 days.

In answer to PCOM's specific question--LITHP is willing to give up lithospheric objectives of Leg 145 in order to drill OSN-2.

However, there is not enough drilling of LITHP interest to give up 10 days, and our willingness to accommodate OSN-2 is due to the fact that Leg 145 does not address high priority objectives. The Panel also strongly felt that it is unacceptable to devastate Leg 145 by removing so much time from its schedule (and even with the revised time estimate, it is still more than the original guidelines for supplemental science). Needless to say, LITHP is pleased that the issue of supplemental science proposals is now dead.

3. Membership

There have been a number of changes in the last year to the Panel as U.S. members have rotated off and non-U.S. scientists have been changed. New British and French representatives began their terms in March, and we have replaced three U.S. panel members.

At the fall meeting, both Jason Phipps-Morgan and Guy Smith were scheduled to rotate off the Panel. Guy has agreed to serve for one more meeting and we have submitted nominations for Jason's replacement to fill our need for an individual with expertise in modeling. Our top candidate has been contacted and is almost certain he would agree to serve if invited.

PCOM had requested that LITHP discuss with TECP whether tectonics interests were covered sufficiently on LITHP. This we did in our joint session, and both panels felt their interests are well represented and the liaisons are appropriate.

A final personal issue that I would like to make you aware of is that I shall be leaving my current position with SEA and moving back to WHOI in a full-time capacity to work with Bob Detrick in coordinating the RIDGE Office. I plan to continue my term as Chair of LITHP, but if any PCOM members have concerns, I would be glad to discuss them.

TECP - PCOM Dec 91

5. Watchdogs - status of tectonic themes

a. Transform margins:

Eg. Atlantic - in prospectus, ne prior.

G. Calif. - needs encouragement.
- model for detachment of terranes, - important geologic process.

b. Rifted margins

(1) NARM - well chosen. logistics site info.

U.R.M. Major new developm
- will cause revision in textbooks

(2) So. Australia - good potential.
thin sed. cover

(3) W. Woodlark basin
Rift propag. into continent
Ophiolite analog

c. Mid-ocean ridges

Enhanced interest + standings

Offset Drilling W.G. or new DPG to come up w/ well-formul. drilling proposal

Crucial - integrated TECP-LITHP objectives

d. Marginal basins:
Pacific: Much recent info
Dynamics is of concern:
Deeper Holes.
Coherent cross-sections
Oriented cores
Atlantic: little recent activity ex. Barbados
Role in Wilson. Cycle?
e. Convergent margins
Much recent info + Cascadia
Barbados - will rise again.
- Disc. w/ proponents - asked to emphasize problems of global concern

f. Collisional margins: 8 active proposals
Medit - T. E.G. Extension in conv. settings
Role of salt.
Land-sea connection
N. Austral -
Foreland basin developm.

g. Stress-dynamics -
Need routine deployment borehole televiewer
Holes need to be deep enough
h. Structure of oceanic crust - seismic vs lithology
Magnetic anomalies - Plate kinematics
Watchdogs - empowered to contact proponents to improve quality of tectonics + str. info
letter-minutes p. 504 of bluebook

TECP-PCOM DEC 91

Panel Membership

Sawyer, Purdy another meeting

Rifted margins:
- Charlotte Keene
- Chris Beaumont
- Mike Stecklin
- Gerard Bond

Physical Mechanisms of Deformation
- Sue Agar
- Carol Simpson
- Jan Tullis

Collisional - Small ocean basins
- Leigh Royden
- Neil Lundberg
- J. Pindell
- Paul Mann
- Roy Kligfield
- John Suppe

Liaison:

TECP to DMP - J.C. Moore

LITHP-TECP ROM Dec 91

JOINT TECP - LITHP MEETING

1. Urgent need to solve problem of formation fluid sampling + pore pressure
2. Need integrated strategy for routine measurements of concern for all panels

3. Common objectives
   Many in marine realm.
   Land-sea connection
   Consider RFP. in US + non-us. publications
   Joint symposia?

4. Submission deadlines

5. Future joint meetings
   1 - 1½ yrs

6. Support: - (see 4 above)

7. D.M.P. Primer. D Hoos, J McClain
   Engineering - M Storms

LITHP TECP PLAN DEC 91

TECP - LITHP Common Objectives

a. Mid Ocean Ridges:
   Lithologic - tectonic - hydrothermal process
   Fast vs slow - interplay magm - tect. processes
   Black smokers' plumbing is structural

b. Rifted contin. margins
   Volc - nonvolc evolution
   Peridotite exposures (e.g. Galicia bank)
   petrol + tect. interest:
   Textures - tectonite + P-T.
   Alpine peridotites, etc
   Partial melt concentration - migration is tectonic process

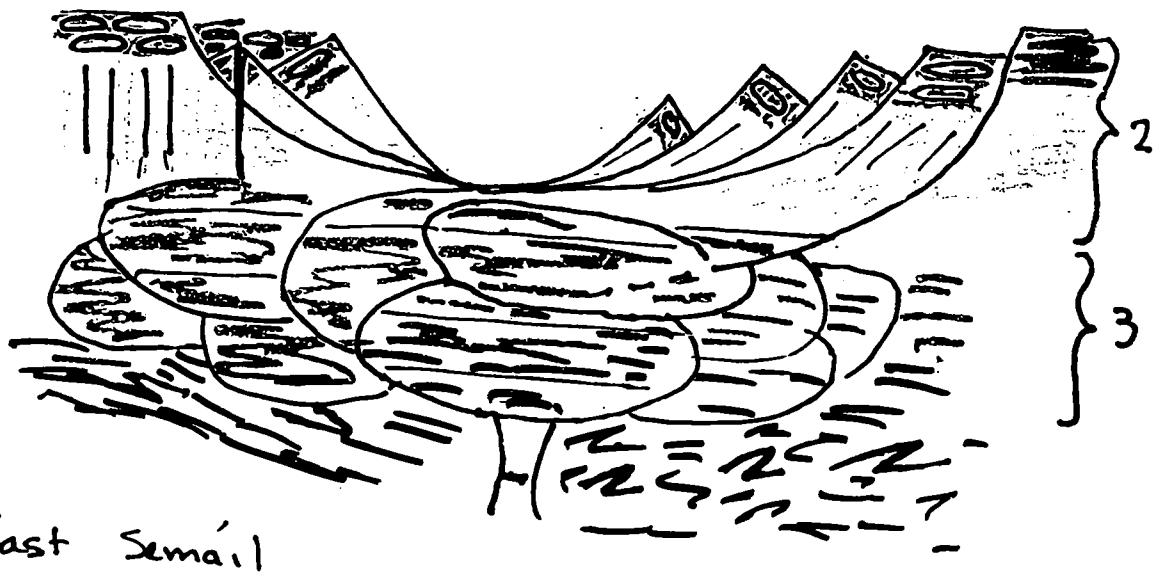
c. Fracture zones:
   Volcanism is lithp objective, but distribution is a tectonic issue
   Tectonic process exposes deeper layers
   Rln to "normal" oc. crust. lith. interp

d. Intraplate
   Tectonic rel to superswells - mantle convection + plate kinematics
   Lith - magma source + evol. →
   2 are interconnected

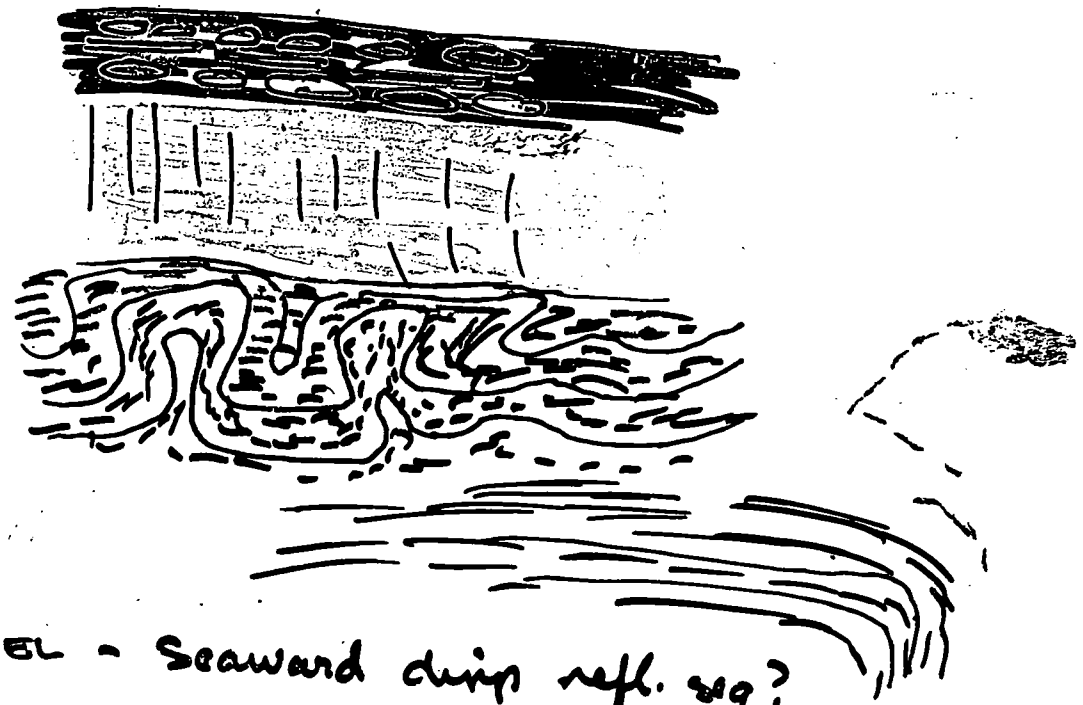
e. Convergent.
   Tectonic controls of magma + hydroth
   Role of fluids in tectonism.

THOUGHT EXPERIMENT

Sloo - Troodos
Vourinos

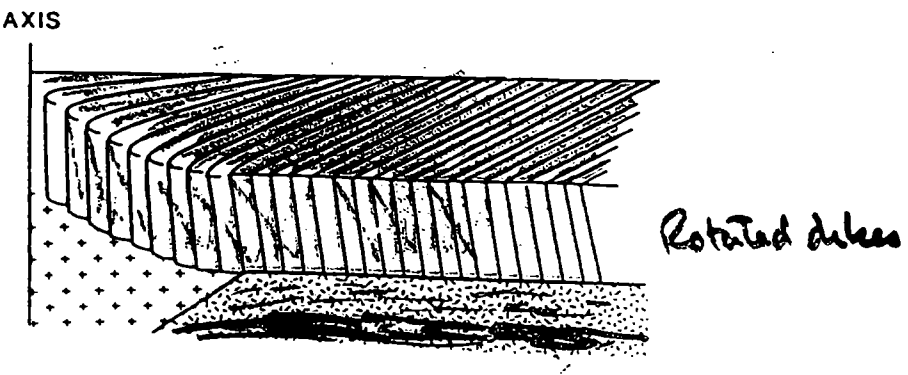


Fast Semail



CANN MODEL - Seaward dip refl. seq?

a)



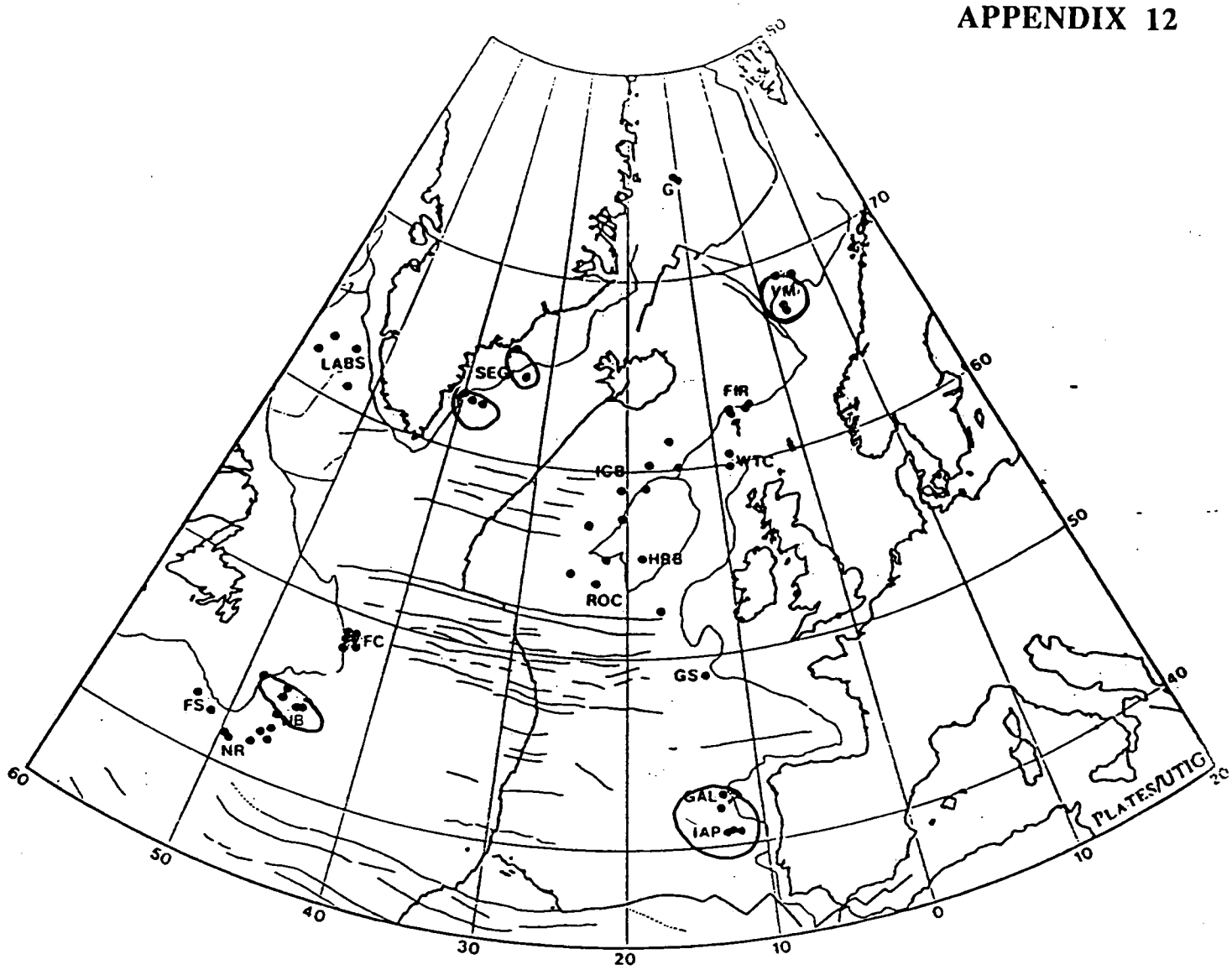


Figure 12. Compilation of all drillsites from the 12 proposals considered by the NARM DPG (see Appendix 2 for detailed information). Continental outlines and mid-ocean ridge axes are indicated by heavy lines; shelf breaks by light lines. Abbreviations and corresponding proposal numbers are: **FC**, Flemish Cap, 365; **FIR**, Faeroe-Iceland Ridge, 396; **FS**, Fogo Seamount, 363; **G**, Greenland, 328; **GAL**, Galicia, 334; **GS**, Goban Spur, 365; **HRB**, Hatton Rockall Bank, 394; **IAP**, Iberian Abyssal Plain, 365; **ICB**, Iceland Basin, 396; **LABS**, Labrador Sea, 392; **NB**, Newfoundland Basin, 365; **NR**, Newfoundland Ridge, 363 **R**, Rockall, 311; **SEG**, Southeast Greenland, 310 & 393; **VM**, Vøring Margin, 358; **WTC**, Wyville-Thomsen Complex, 395. Digital map courtesy of PLATES/UTIG (M. Coffin and L Gahagan).

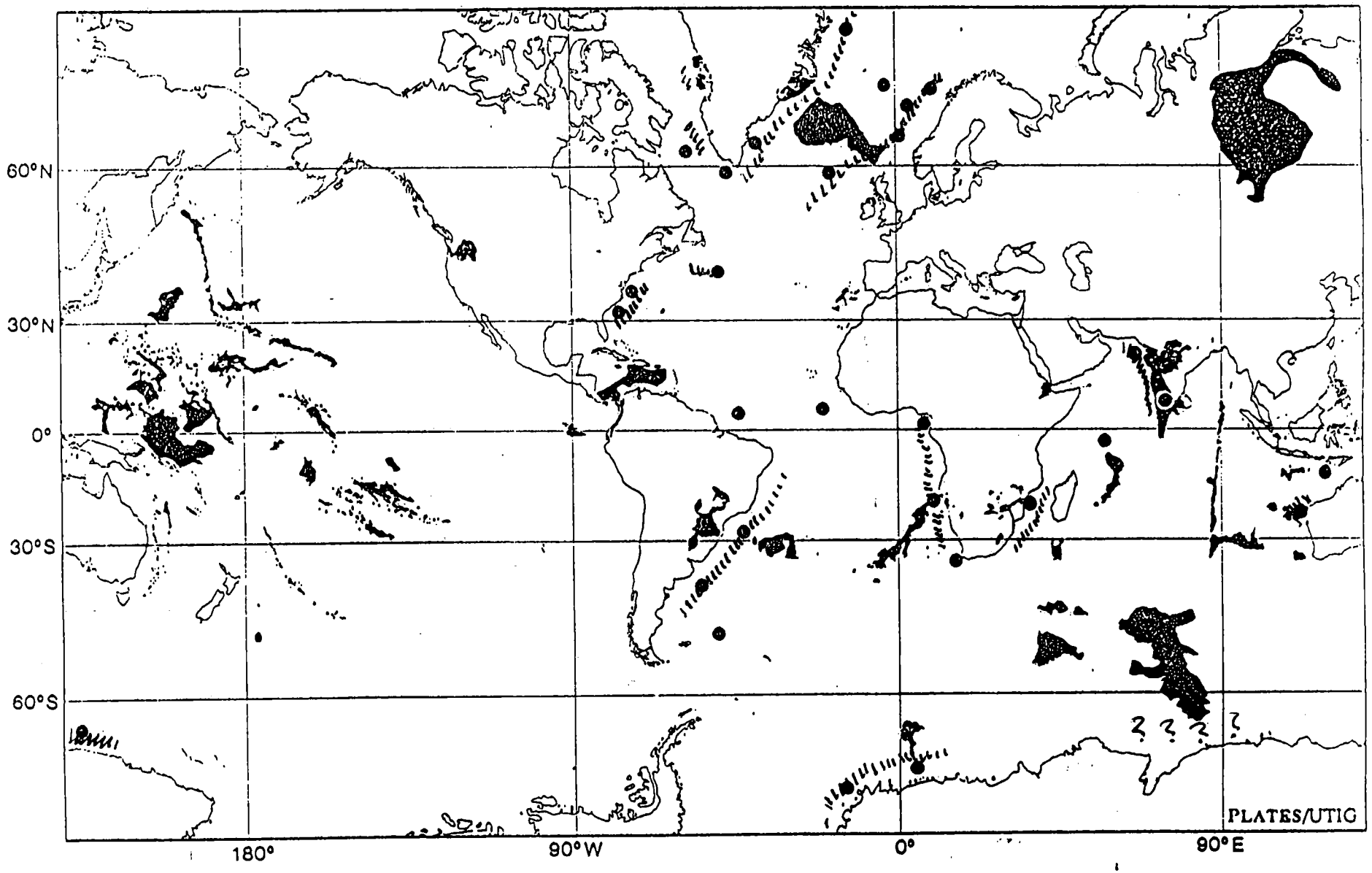


Figure 1.1. Global large igneous provinces (LIPs), including continental flood basalt (CFB) and associated intrusive provinces; volcanic passive margins; oceanic plateaus; submarine ridges; ocean basin flood basalts; and seamount groups. Volcanic passive margins along which seaward dipping reflector sequences (SDRSs) have been recognized are indicated by filled circles. From Coffin and Eldholm (1991).

8 LEG PROGRAM

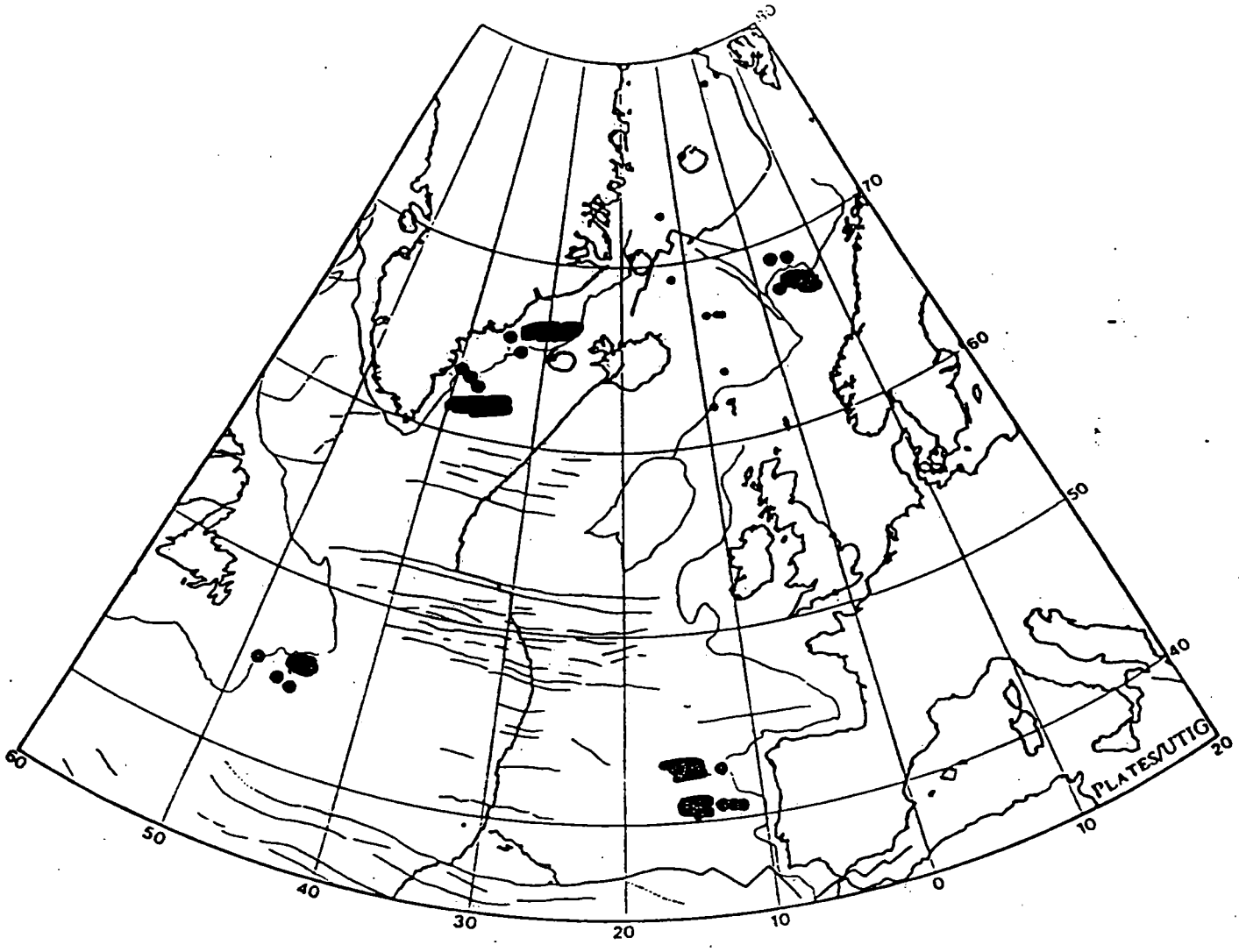


Figure A. Compilation of all high priority drillsites selected by the NARM DPG (filled circles; see Table A for detailed information); and all high priority drillsites south of 80°N selected by the NAAG DPG (asterisks). Abbreviations and corresponding proposal numbers are: EG, East Greenland, 310 & 393; GAL, Galicia, 334; IAP, Iberian Abyssal Plain, 365; NB, Newfoundland Basin, 365; VM, Vøring Margin, 358. Continental outlines and mid-ocean ridge axes are indicated by heavy lines; shelf breaks by light lines. Digital map courtesy of PLATES/UTIG (M. Coffin and L Gahagan).

ENGINEERING DEVELOPMENT PRIORITIZATION

ESTABLISHED BY PCOM APRIL 1991/URI

PRIMARY DEVELOPMENTS

(1) DIAMOND CORING SYSTEM (DCS)

(2) EXTENDED CORE BARREL - FLOW CONTROL (XCB-FC)

DEVELOPMENTS RESPONDING TO SCHEDULED LEG NEEDS

(3) LEG 139: REENTRY CONE/BORE HOLE SEAL (CORK)
PRESSURE CORE SAMPLER (PCS)
HIGH TEMPERATURE/H_2S PREPARATIONS

(4) LEG 141: HARD ROCK ORIENTATION (HRO)
SONIC CORE MONITOR (SCM)
ELECTRONIC MULTISHOT

(5) LEG ???: VIBRA PERCUSSIVE CORER (VPC)
(GENERAL 1992 SGPP OBJECTIVES)

(6) LEG 146: MOTOR DRIVEN CORE BARREL (MDCB)
(TO SUPPORT CASCADIA GEOPROPS DEPLOYMENT)

PCOM MEETING
DEC 4-7, 1991
AUSTIN, TEXAS

DIAMOND CORING SYSTEM (DCS)

THE FOLLOWING HAS BEEN COMPLETED:

* **PREPARATIONS FOR LEG 142/EAST PACIFIC RISE: (WILL BE 3RD ENGINEERING TEST OF DCS SYSTEM)**
  * MAXIMIZED DCS CORING TIME
  * BARE ROCK SPUD/100-150 MBSF PENETRATION
  * MINIMUM 50 PERCENT RECOVERY
  * 2-SLIMHOLE DIA DRILLERS WILL BE ABOARD

* **IMPROVE/REFURB/TESTING OF DCS PHASE IIB DRILL RIG:**
  * CONDUCTED FULL SCALE SLINGSHOT TEST
  * ADDED LOW FRICTION SEALS TO FEED CYLINDERS
  * ADDED PLATFORM FIRE EXTINGUISHER SYSTEM
  * SECONDARY HC CODE USING MOONPOOL ACCEL
  * HIGH PRESSURE HYDRAULIC FILTER SYSTEM
  * IMPROVED WINCH CONTROLS

* **IMPROVE/REFURB/TESTING OF MINI HARD ROCK BASE:**
  * 3-LEG/HEX SHAPE GUIDE BASE
  * COUNTER BALANCE REPLACES FLOATATION PANELS
  * 8-FOOT CONE REPLACES 14 FOOT CONE
  * ELECTRONIC TILT BEACON ADDED
  * STRENGTHENED CSG HGR/LANDING SEAT KEYWAY
  * WELDED J-TOOL FOR DEPLOYMENT/TENSIONING
  * REVIEWED STRESS JOINT/SHEAR BOLT DESIGN
  * DEVELOPED ALTERNATE "SAFETY JOINT" CONCEPT

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DIAMOND CORING SYSTEM (DCS)

THE FOLLOWING HAS BEEN COMPLETED:

* IMPROVE/REFURB/TESTING OF DRILL-IN-BHA SYSTEM:
  * NESTED (2ND STAGE) 10-3/4 DC CONCEPT
  * DI-BHA BIT/CENTER BIT DESIGNS
  * RE-DESIGNED/TESTED BACK-OFF SUB SLIP TAPER
  * REAMING BIT OPTION FOR DCS HOLE OPENING
  * DIAMOND CORE BARREL (DCB/RCB) OPTION (7-1/4 BIT, 6-3/4 DC, 2.3 RCB WIRELINE CORE)

* IMPROVE/REFURB/TESTING OF C'BBL/SAMPLER SYSTEMS:
  * ADDED CORE CATCHER OPTIONS
  * ADDED PUSH/PISTON/SPLIT SPOON SAMPLER OPTIONS
  * ADDED C'BBL FLOAT VALVE OPTION

* INSPECTED/REFURBISHED DCS TUBING STRING

* FEASIBILITY STUDIES - DCS PHASE III
  * RISER TENSIONER CONCEPT
  * BOTTOM SLIP-JOINT CONCEPT
  * BOTH CONCEPTS REVIEWED W/TEDCOM
  * HOSTED JOI DCS PHASE IIB/PHASE III REVIEW MTG

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DIAMOND CORING SYSTEM (DCS)

THE FOLLOWING REMAINS TO BE COMPLETED:

DCS PHASE III

* FINAL REVIEW OF BOTH CONCEPT FEASIBILITY STUDIES
* DESIGN REVIEW OF GUIDE HORN ASSEMBLY
* PRELIMINARY DESIGN OF MAST/FEED CYLINDER ASSEMBLY
* DYNAMIC ANALYSIS OF DCS/RISER RELATIVE MOTION
* ANALYSIS OF DCS CORING STRING "IN-HOLE" MOTION (POTENTIAL HOLE INSTABILITY/DIAMOND BIT DAMAGE)
* CONTINUE PURSUING INDUSTRY DEA INVOLVEMENT
* FINAL DESIGN/FABRICATION OF PHASE IIISYSTEM
* PHASE III SYSTEM AVAILABLE FOR SEA TRIALS: (ESTIMATED TO BE OCTOBER 94)
* ADDITIONAL PHASE IIB DEPLOYMENTS: ?????

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EXTENDED CORE BARREL - FLOW CONTROL (XCB-FC)

* FLOW CONTROL "ANTI-CLOG" VALVE HAS BEEN:
  * DESIGNED
  * ANALYTICALLY MODELLED
  * FABRICATED
  * SHORE TESTED

* SYSTEM IS ABOARD THE SHIP FOR LEG 141 SEA TRIALS

PCOM MEETING
DEC 4-7, 1991
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LEG 141 PREPARATIONS
HARD ROCK ORIENTATION/SONIC CORE MONITOR
ELECTRONIC MULTISHOT

* SCM HARDWARE/SOFTWARE FABRICATED AND TESTED

* ELECTRONIC MULTISHOT FABRICATED AND TESTED

* NEW NON-MAGNETIC PRESSURE CASE FABRICATED

* CORE SCRIBING SYSTEM TESTED ON EARLIER LEG

* ALL HARDWARE ABOARD FOR LEG 141 SEA TRIALS

* SYSTEM IS NOW DESIGNED FOR DEPLOYMENT WITH EITHER XCB OR RCB CORING SYSTEMS

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DEC 4-7, 1991
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VIBRA PERCUSSIVE CORER (VPC)

* NOVATEK SUBCONTRACTOR CONTINUING TO WORK ON 7" PERCUSSIVE HAMMER DESIGN PROBLEMS

  [APPLICABLE TO ODP 3 1/2" SYSTEM]

* SHELL DEVELOPMENT FUNDING RESEARCH ON 7" TOOL

* LAND TESTING OF 7" TOOL SCHEDULED FOR NOV/DEC 91

* BASED ON TEST RESULTS ODP TOOL WILL BE:

  * REFURBISHED/DESIGN MODS AS AVAILABLE

  * RETESTED ON LAND AT ODP/TFAC OR TERRATEK LAB

  * REDEPLOYED FOR CONTINUED SEA TRIALS (LIKELY ON LEG 145 ???)

PCOM MEETING
DEC 4-7, 1991
AUSTIN, TEXAS

LEG 146 CASCADIA PREPARATIONS

MOTOR DRIVEN CORE BARREL (MDCB)

* EARLIER VERSION OF MDCB ANALYTICALLY MODELED
* DESIGN DEFICIENCIES IDENTIFIED
* MDCB REDESIGNED WITH ANTI-STALL FEATURE
* NEW DESIGN ANALYTICALLY MODELED
* NEW MDCB FABRICATED
* SUCCESSFUL MDCB SHOP TEST COMPLETED
* ALL MDCB HARDWARE ABOARD SHIP F/LEG 141 SEA TRIALS
* DECK TEST/X-TRAINING CONDUCTED ON LEG 141 TRANSIT

GEOPROPS PROBE

* BOB CARSON HAS ASSUMED ROLE OF PI
* FUNDING FOR REQUIRED MODS/TESTING IN PROGRESS
* ODP WILL OVERSEA ALL REQUIRED DESIGN AND TESTING
* SYSTEM NOW SCHEDULED FOR SEA TRIALS ON LEG 146

PCOM MEETING
DEC 4-7, 1991
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DEEP DRILLING PROGRESS REPORT

ODP/TAMU DEFINES DEEP DRILLING AS:

ANY HOLE REQUIRING MORE THAN 1 LEG TO DRILL

APPROXIMATELY 1200-1800 METERS

DEPENDING ON LITHOLOGY

PCOM MEETING
DEC 4-7, 1991
AUSTIN, TEXAS

DEEP DRILLING PROGRESS REPORT

IN-HOUSE DRAFT STUDIES AND FINAL REPORTS IN PROGRESS INCLUDING:

* INDUSTRY HARDWARE/CAPABILITIES

* JR471 CAPABILITIES REVIEW

* WELL PLANNING BASED ON PAST ODP EXPERIENCE

* COMPILATION OF JOIDES PANEL INPUT

* REVIEW OF EXISTING ODP/TAMU HARDWARE (INCLUDING POSSIBLE MODS/UPGRADES)

* CASING/DRILL STRING STRESS ANALYSIS (STATIC CASING DEPLOYMENT LOAD LIMITS)

PCOM MEETING
DEC 4-7, 1991
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DEEP DRILLING PROGRESS REPORT

REMAINING TASKS:

* DEVELOP RFP FOR TEDCOM REVIEW ON DEEP DRILLING BEYOND ODP/TAMU CAPABILITIES (3000 METERS ???)

* INTERFACE WITH TEDCOM MEMBERS ON APPROPRIATE INDUSTRY CONSULTANTS TO CONDUCT STUDY

* REVIEW RFP WITH TEDCOM AND MEET WITH CONSULTANT PROSPECTS

* DYNAMIC STRESS ANALYSIS OF CASING/DP LOADS

* DETAILED PLANNING OF NEXT DEEP DRILLING EFFORT (PENDING PCOM SCHEDULING)

* OUTSIDE REVIEW OF ODP WELL PLAN

* REDESIGN/MODIFICATION/FABRICATION/TESTING OF EXISTING HARDWARE AS REQUIRED

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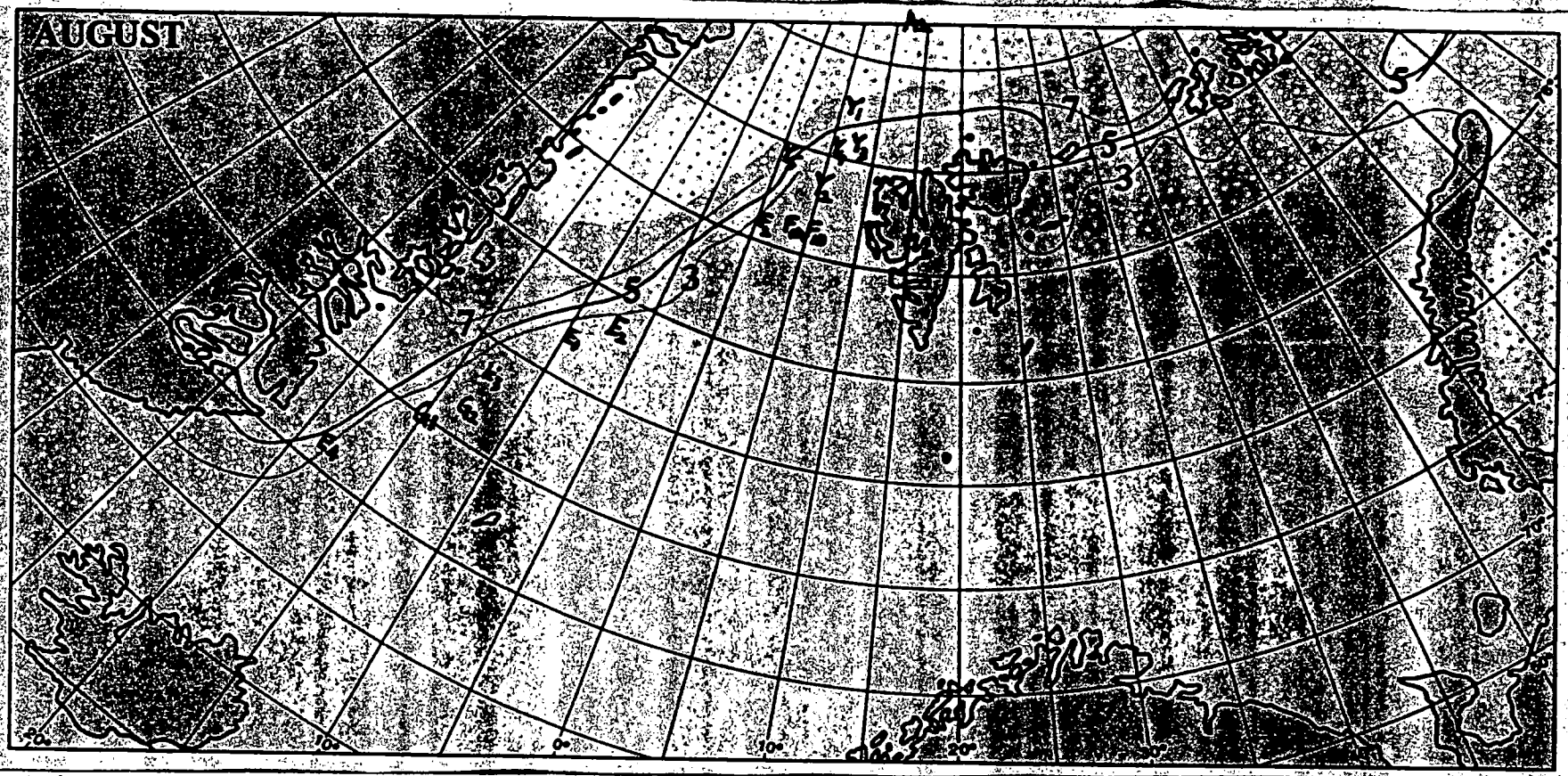
AUSTIN, TEXAS



North Atlantic Arctic Gateways sites plotted on Torgny Vinje's (1985, Norsk Polarinstitutt) map of sea ice distribution for August.

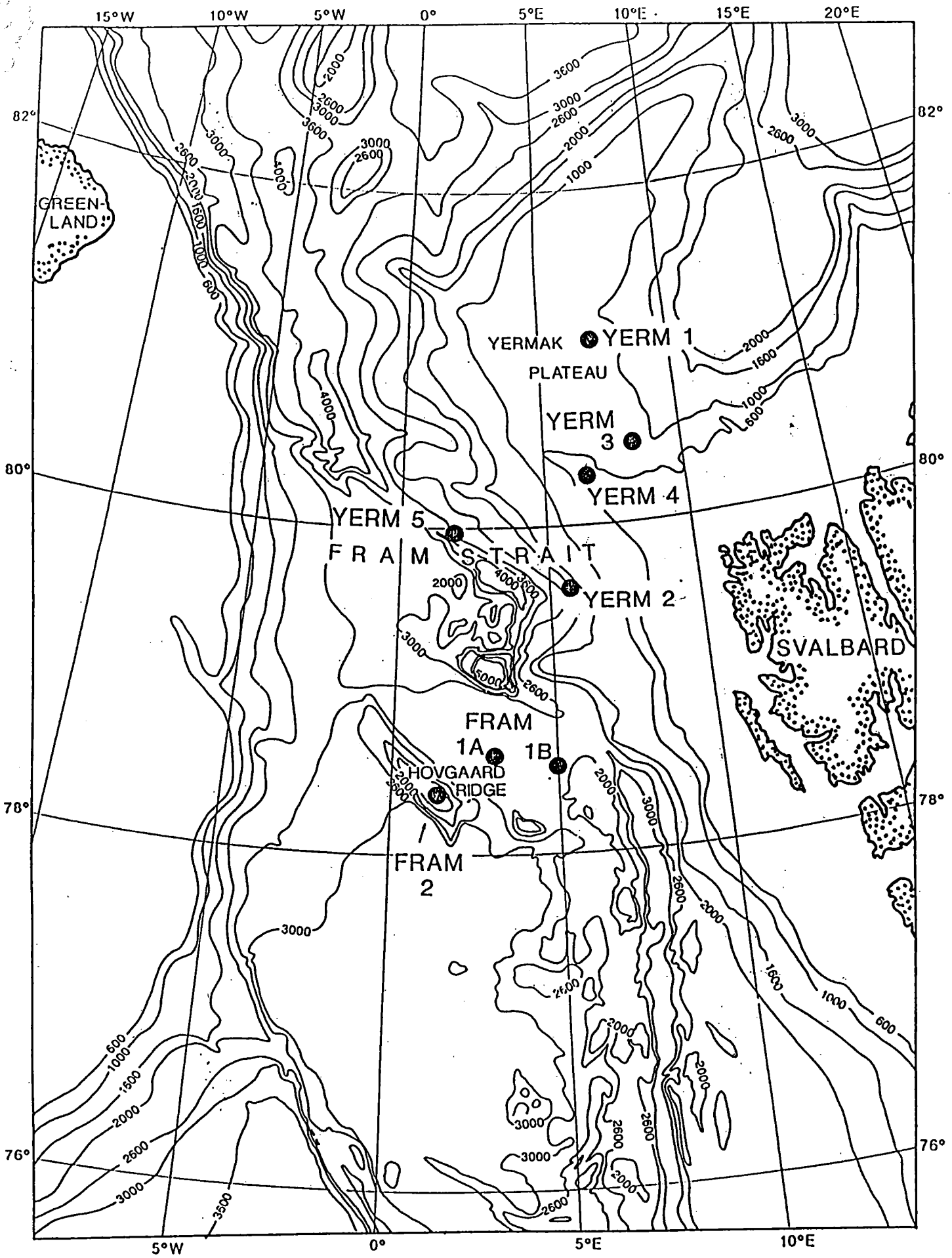


Figure 4. Bathymetry in meters and location of FRAM and YERM sites.

THE PROBABILITY OF ICE-FREE CONDITIONS AT EIGHT PROPOSED ODP DRILLING SITES IN THE FRAM STRAIT REGION

Peter Wadhams

A report on the analysis of 26 years of data from sea ice charts covering ice conditions in Fram Strait for the months of July-October, and a statistical treatment of the distribution of ice-free periods at each of the sites.

October 1991.

CAMBRIDGE POLAR CONSULTANTS

40 Grafton Street, Cambridge CB1 1DS, England
Telephone 44-223-322631, 336542
Fax 44-223-336549 Telemail P.Wadhams

TABLE 2. Meteorological Office ice chart frequencies, 1966-1991, and numbers of charts analysed.

Year	No. charts analysed July-October	Comments
1966	19	Approximately once per week
1967	18	" " " "
1968	87	Daily except for Saturday and Sunday
1969	123	Daily
1970	123	Daily
1971	121	Daily
1972	122	Daily
1973	123	Daily
1974	106	Daily
1975	123	Daily
1976	123	Daily
1977	123	Daily
1978	123	Daily
1979	123	Daily
1980	53	Approximately 3 times per week
1981	53	Approximately 3 times per week
1982	35	Approximately twice-weekly
1983	34	" "
1984	34	" "
1985	36	" "
1986	35	" "
1987	32	" "
1988	34	" "
1989	35	" "
1990	35	" "
1991	24	" " (to Sept 19)

Total number of charts analysed: 1897

1973		Y1	Y2	Y3	Y4	Y5	F1A	F1B	F2
July	1	7-10	7-10	7-10	7-10	7-10	7-10/1-3	1-3	7-10
	2	7-10	7-10	7-10	7-10	7-10	7-10/1-3	1-3	7-10
	3	7-10	7-10	7-10	7-10	7-10	7-10/1-3	1-3	7-10
	4	7-10	7-10	7-10	7-10	7-10	7-10/1-3	1-3	7-10
	5	7-10	7-10/1-3	7-10	7-10	7-10	W<2°	W<2°	1-3
	6	7-10	7-10	7-10	7-10	7-10	W<2°	W<2°	1-3
	7	7-10	7-10	7-10	7-10	7-10	W<2°	W<2°	1-3
	8	7-10	7-10	7-10	7-10	7-10	W<2°	W<2°	1-3
	9	7-10	7-10	7-10	7-10	7-10	1-3	W<2°	7-10/4-6
	10	7-10	7-10	7-10	7-10	7-10	1-3	W<2°	7-10/4-6
	11	7-10	7-10	7-10	7-10	7-10	1-3	W<2°	7-10/1-3
	12	7-10	7-10	7-10	7-10	7-10	W<0°	W<2°	W<0°
	13	7-10	7-10	7-10	7-10	7-10	W<0°	W<2°	W<0°
	14	7-10	7-10	7-10	7-10	7-10	W<0°	W<2°	W<0°
	15	7-10	7-10	7-10	7-10	7-10	W<0°	W@0°	W<0°
	16	7-10	W<0°	7-10	7-10	7-10	W<0°	W<2°	7-10/W
	17	7-10	W<0°	7-10	7-10	7-10	W<0°	W<2°	7-10/W
	18	7-10	W<0°	7-10	7-10	7-10	W<0°	W<2°	W<0°
	19	7-10	4-6/W	4-6	4-6	7-10	W<0°	W<2°	W<0°
	20	7-10	4-6/W	4-6	4-6	7-10	W<0°	W<2°	4-6/W
	21	7-10	4-6/W	4-6	4-6	7-10	W@0°	W<2°	4-6/W
	22	7-10	4-6/W	4-6	4-6	7-10	W<0°	W<2°	4-6/W
	23	7-10	1-3	7-10	7-10	7-10	W<4°	W<4°	1-3
	24	7-10	W<0°	7-10	7-10	7-10	W<2°	W<2°	1-3
	25	7-10	W<0°	7-10	7-10	7-10	W<2°	W<4°	1-3
	26	7-10	1-3/W	7-10	7-10/W	7-10	W<4°	W<4°	W@2°
	27	7-10	1-3/W	7-10	7-10/W	7-10	W<4°	W<4°	W<4°
	28	7-10	1-3/W	7-10	W<0°	7-10	W<4°	W<4°	W<4°
	29	7-10	1-3/W	7-10	W<0°	7-10	W<4°	W<4°	W<4°
	30	7-10	4-6	7-10	4-6/W	7-10	4-6	4-6	W<4°
	31	7-10	4-6	7-10/W	4-6	7-10	4-6	4-6	W<4°
Aug	1	7-10	4-6	7-10	7-10	7-10	W<2°	4-6	W<2°
	2	7-10	4-6	4-6	4-6	4-6	W<4°	W>4°	W<4°
	3	7-10	4-6	4-6	4-6	4-6	W<4°	W>4°	W<4°
	4	7-10	4-6	4-6	4-6	4-6	W<4°	W@4°	W<4°
	5	7-10	4-6	4-6	4-6	4-6	W<4°	W<4°	W<4°
	6	7-10	4-6	4-6	4-6	4-6	W<4°	W<4°	W<2°
	7	7-10	1-3	1-3	1-3	7-10	W<4°	W<4°	1-3
	8	7-10	W<2°	1-3	1-3	7-10	W<2°	W<2°	W<2°
	9	7-10	W<2°	1-3	1-3	7-10	W<2°	W<2°	W<2°
	10	7-10	W<2°	1-3	1-3	7-10	W<4°	W<4°	W<4°
	11	7-10	1-3	1-3	1-3	7-10	W<4°	W<4°	W<4°
	12	7-10	1-3	1-3	1-3	7-10	W<4°	W<4°	W<4°
	13	7-10	W<2°	1-3	1-3	7-10	W<4°	W<4°	W<4°
	14	7-10	1-3	1-3	1-3	7-10	W<4°	W<4°	W<4°
	15	7-10	4-6	7-10	7-10	7-10	W<4°	W<4°	W<4°
	16	7-10	4-6	7-10	7-10	7-10	W<4°	W<4°	W<4°
	17	7-10	4-6	7-10	7-10	7-10	W@2°	W<4°	W@2°
	18	7-10	4-6	7-10	7-10	7-10	W<2°	W<4°	W@2°
	19	7-10	4-6	7-10	7-10	7-10	W<2°	W<4°	W@2°
	20	7-10	4-6	7-10	7-10	7-10	W<2°	W@2°	W@2°
	21	7-10	4-6	7-10	7-10	7-10	W<2°	W<4°	1-3
	22	7-10	1-3	7-10	7-10	7-10	W<2°	W@2°	W<2°
	23	7-10	1-3	7-10	7-10	7-10	W<2°	W<2°	W<2°
	24	7-10	1-3	7-10	7-10	7-10	W<2°	W<2°	W<2°
	25	7-10	1-3	7-10	7-10	7-10	W<2°	W<2°	W<2°

FIGURE 3. Total number of ice-free site-days during July-October period, for each year from 1966 to 1990. The lower histogram shows YERM sites only; the upper histogram shows YERM and FRAM together. In each case the 25-year mean is shown as a dashed line.

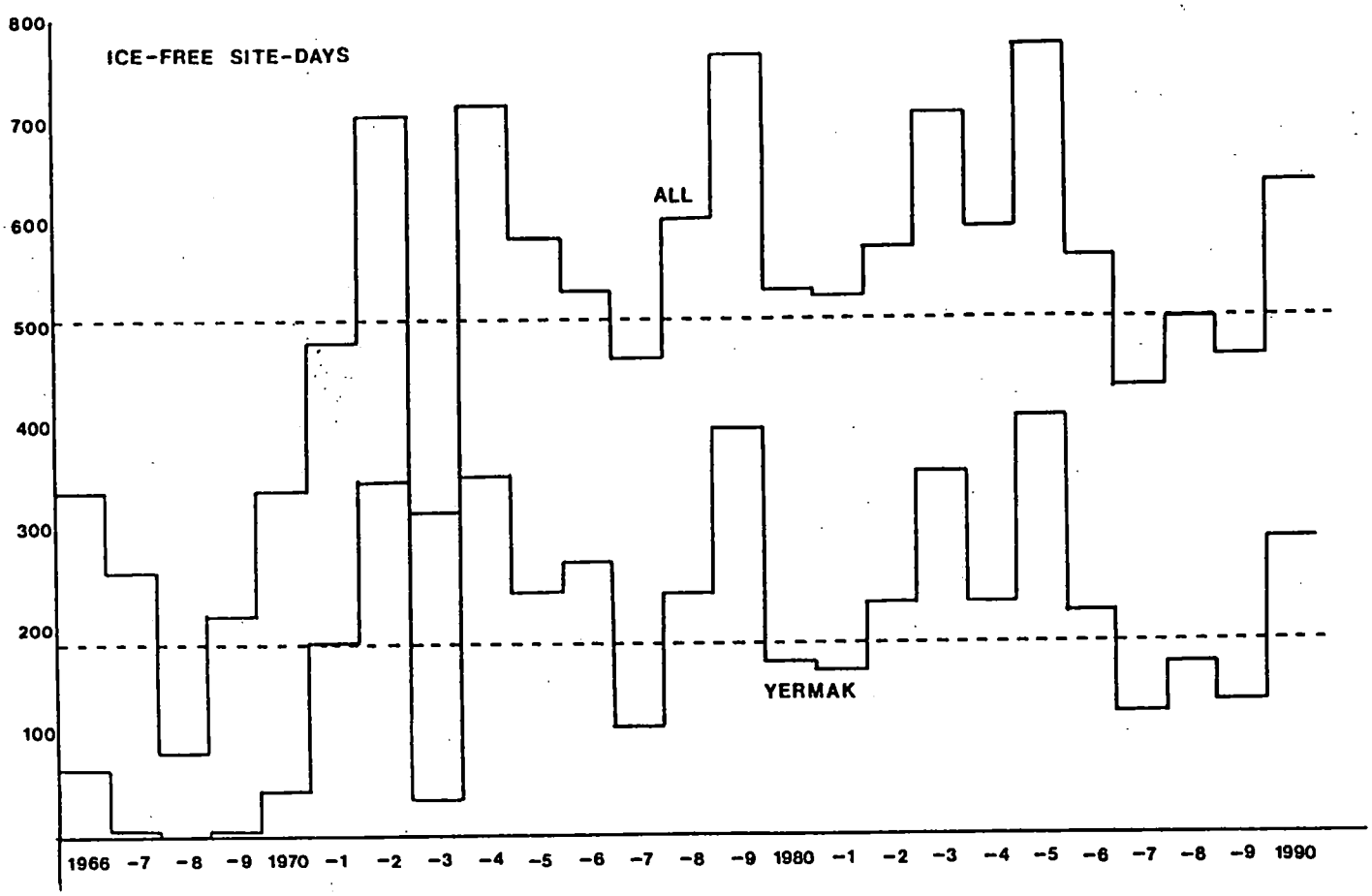


TABLE 6. For the period 1970-9 averaged, the percentage probability pN that if a given drilling site is approached on a random day during August or September, the site in question will be ice-free on that day and on (N-1) subsequent days.

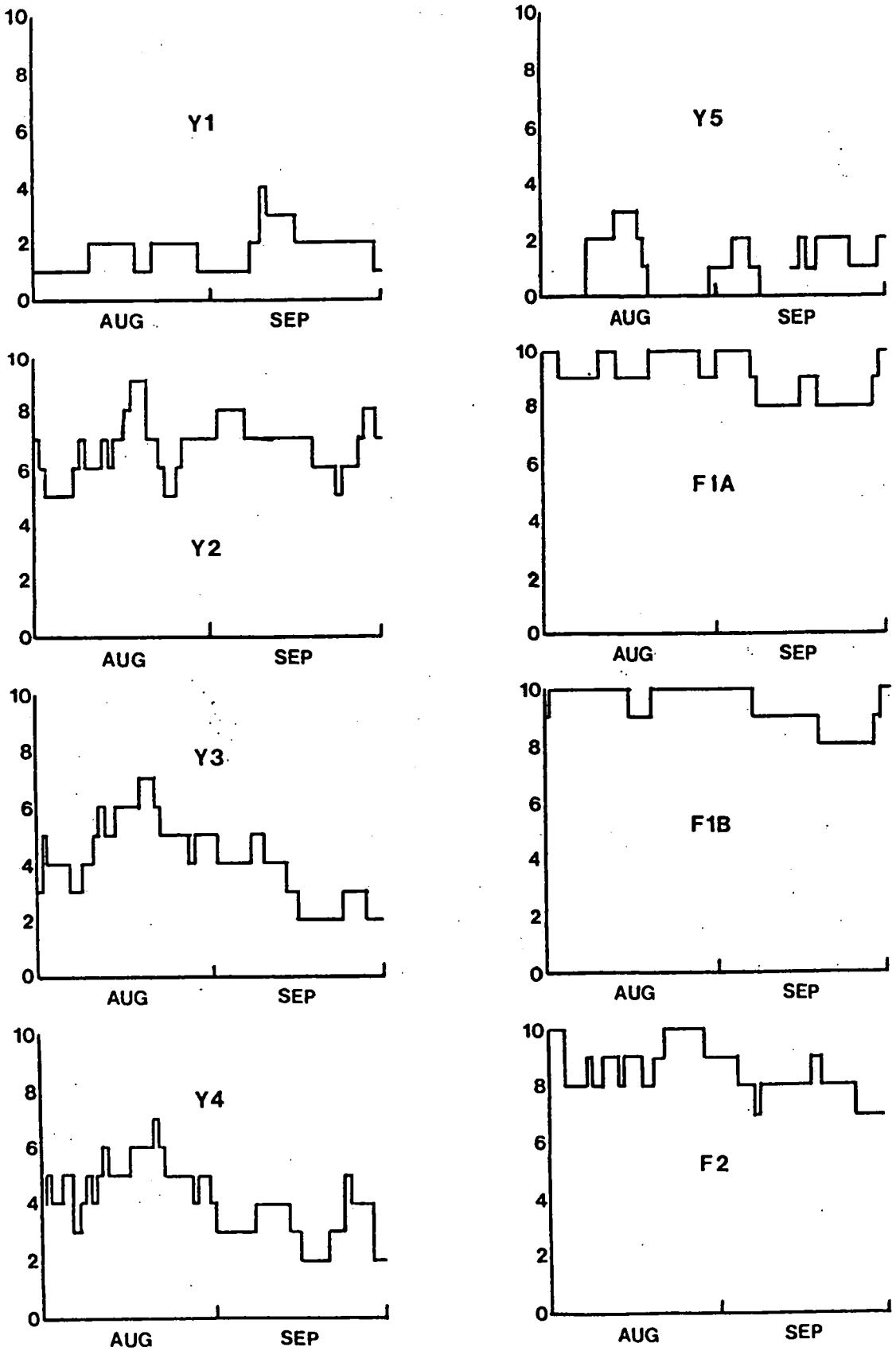
AUGUST

Site	N= 2	3	4	5	6	7	8	9	10	11	12
Y1	16.5	15.8	15.2	14.5	13.9	13.2	12.6	11.9	11.3	10.6	10.0
Y2	71.9	68.1	65.2	62.3	60.0	58.4	57.1	56.1	55.2	54.2	53.2
Y3	56.1	52.6	49.7	47.4	45.2	43.2	41.3	39.7	38.1	36.8	35.5
Y4	56.8	51.6	49.7	46.8	43.9	42.3	40.6	39.0	37.4	36.5	35.5
Y5	11.9	10.3	8.7	7.7	6.8	5.8	4.8	3.9	2.9	1.9	1.0
F1A	96.8	95.8	94.8	93.9	92.9	92.0	91.3	90.6	90.0	89.0	87.7
F1B	99.0	98.7	98.4	98.1	97.7	97.4	97.1	96.8	96.5	95.8	95.2
F2	94.2	92.3	90.3	88.4	86.5	84.5	82.9	81.3	79.7	77.7	75.8

SEPTEMBER

Site	N= 2	3	4	5	6	7	8	9	10	11	12
Y1	21.7	20.7	19.7	18.7	18.0	17.3	16.7	16.0	15.3	15.0	14.7
Y2	73.7	71.3	69.3	67.0	64.3	62.0	59.7	57.7	55.7	54.0	52.7
Y3	37.7	34.0	31.7	29.7	28.0	26.3	24.7	23.3	22.0	20.7	19.7
Y4	42.0	38.3	35.7	33.3	31.0	28.7	26.3	24.3	23.0	21.7	20.7
Y5	16.7	14.0	12.0	10.0	9.0	8.0	7.0	6.3	5.7	5.3	5.0
F1A	86.0	85.0	84.0	83.0	82.0	80.7	79.3	78.3	77.3	76.7	76.3
F1B	90.3	89.7	89.0	88.3	87.7	87.0	86.3	85.7	85.0	84.7	84.0
F2	82.0	80.7	79.3	78.0	76.7	75.3	74.3	73.3	72.0	71.0	70.0

FIGURE 4. Number of years during 1970-9 period when, on a given date during August-September, a given site is ice-free and remains ice-free for the subsequent 3 days (making 4 ice-free days in all).



5. SITE-BY-SITE REVIEW

With the results and general discussion from section 4 we can now draw some clear conclusions about the suitability of the eight proposed sites for drilling.

Our main conclusion is that there are four levels of difficulty for drilling, which can be summarised as follows:-

Very favorable sites	**F1B**
	F1A
	F2
Favorable site	**Y2**
Unfavorable sites	**Y4**
	Y3
Very unfavorable sites	**Y1**
	Y5

We expand on these judgements below.

Y1

This is one of the two most unfavorable sites. It is the northernmost site, beyond 81°N (fig.1, table 1), and lies to the north of the typical limit of the so-called "Whalers' Bay" (Vinje, 1977), the ice-free bight where the warm water of the West Spitsbergen Current sinks beneath the polar surface water of the Arctic Basin. This implies that at most times of most years it is decidedly ice-covered, by heavy Polar pack ice, but that in exceptional years, when the polar front is displaced northwards by wind or current forcing, it may become uncovered. Under these circumstances it will tend to remain ice-free for lengthy periods, and so, as table 3 shows, it tends to be either completely ice-covered through the July-October period or else (more rarely) relatively ice-free throughout the period. July conditions can therefore be useful as a guide to August and September conditions.

As table 4 shows, an approach to site Y1 has only a 3.6% probability of encountering ice-free conditions in July, rising to 11.1% in August, a

SPECIALTY TOOL STATUS (ODP-OWNED)

TOOLS IN HAND

BHTV
ANALOG TOOL
2 DIGITAL TOOLS,
a) Slimhole, 125°C
(needs tubing string pulled to use with DCS)
b) High T, 300°C

Gable High T Temperature Tool
350°C range, 0.001° resolution
slimhole, will transit DCS tubing (barely)
New High T cable head may be adapted as ODP high T standard

Lamont Temperature Tool
rated to 125°C
standardly run at bottom of Schlumberger tool strings

High T logging Cable
rated to 350°C
first land test in Feb 1992 (3 km, 300° C geothermal well)
allows control of operations downhole, high power consumption, high data acquisition rates

TOOLS ON ORDER OR IN DEVELOPMENT

High T Resistivity
September delivery of analog tool, 350°C
Cable Tool
Upgrade path to full digital (if analog successful)

Wireline Packer
needs major redesign to function properly

TOOLS TO BE ORDERED OR ACQUIRED

High Resolution Geochemical tool (possibly to be dewared in future)
Slimhole High T memory tool
Slimhole Annulus fluid sampler

SPECIALTY TOOL STATUS (Third Party)

TESTED TOOLS

LETI Magnetometer/Susceptibility Tool
low resolution (~1.5 m), high sensitivity tool
run on leg 134

Becker/Morin Flowmeter Tool
pressure/flow/caliper
run on legs 137/139/140

Japex High T Pressure/Temperature/Flowmeter tool
run on leg 139

Sandia GRC Temperature
run on leg 139

LANL High T Fluid Sampler
run on leg 139

TOOLS IN DEVELOPMENT/TESTING STAGE

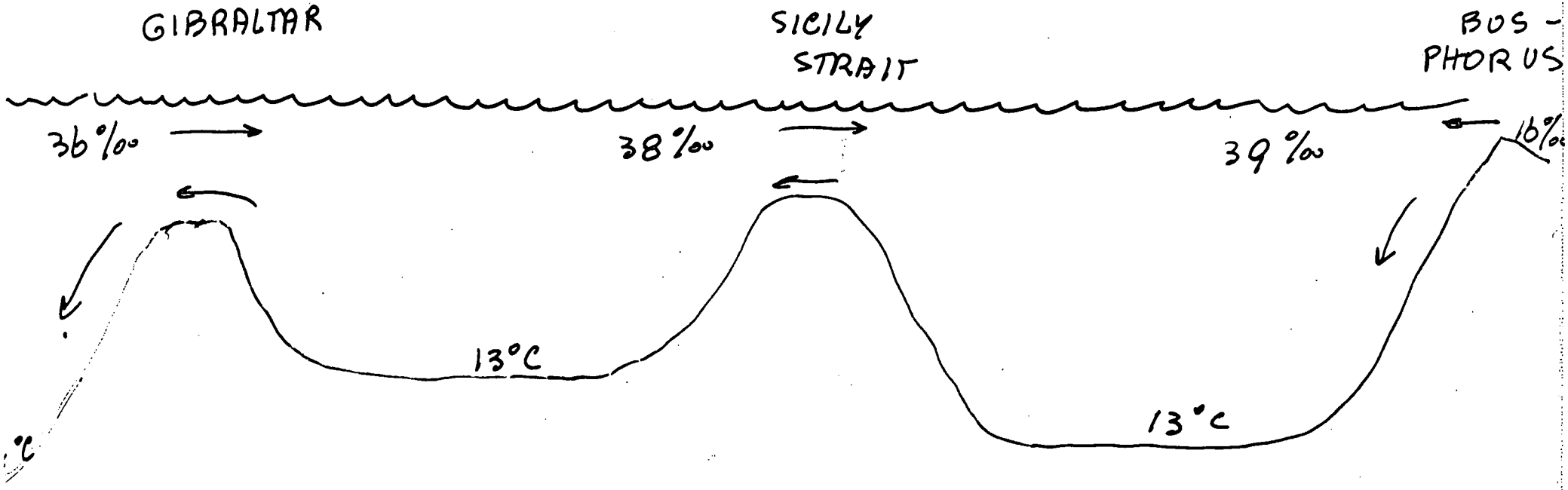
Japanese Downhole Magnetometer
3-component, resolution to 1 nT
memory tool
to be tested on Leg 144

TOOLS IN PLANNING PROCESS

LETI Very High Resolution Magnetometer/Susceptibility Tool
2.5 cm resolution pad-type tool
available 1994 (?)

German KTB susceptibility Tool
No specs available at this time

PROPOSAL LACKS GEOLOGICAL PERSPECTIVE → IN TIME ↘ IN SPACE



CURRENTS REVERSAL AT GIBRALTAR ?

no sapropels in W MED
no indication in NE Atlantic

UPWELLING IN EASTERN MED ??

low sed. rates
disappearence of benthic forams

APPENDIX 16

PCOM authorizes the establisment of a 1.5 day ~~workshop~~ to be held in early March 1992 in eastern North-America to advise on:

(a) A new database structure for ODP to cope with the rapidly expanding needs of the project, and particularly to facilitate core/log integration

(b) An appropriate hardware and software computing environment for the ~~Ocean Drilling Project~~ in the 1990's, compatible with (a) above.

Notes.

1. It is intended that the members of the workshop would receive, as briefing documents, the report of an internal ODP/TAMU workshop on the status of computing within ODP to be held at College Station on January 24th, 1991, and other briefing material.

2. Paticipants would include:

(i) A computer specialist from each of the JOIDES institutions, familiar with the special problems of a complex ship/shore earth science computing environment.

(ii) Representatives of each of the foreign partners (preferably representatives with extensive computer systems/database expertise)

(iii) The chair of SMP and the chair of DMP or their representatives

(iv) A representative from the Logging Group.

(v) A representative from PCOM

(vi) Invited representatives from ODP/TAMU

The meeting would be organized by the chair of IHP, who would be responsible for the production of a summary report. This would be considered by IHP at their meeting in College Station (April, 1st, 1992) and then forwarded to PCOM for consideration at their April meeting.