JOIDES PLANNING COMMITTEE ANNUAL MEETING
28 November - 2 December 1988
Rosenstiel School of Marine and Atmospheric Science
Miami, Florida

MINUTES

Members:

R. Moberly (Chairman) - Hawaii Institute of Geophysics
K. Becker - University of Miami (for G. Brass)
D. Cowan - University of Washington
O. Eldholm - University of Oslo, ESF Consortium
T. Francis - Inst. of Oceanographic Sciences, United Kingdom
M. Kastner - Scripps Institution of Oceanography
Y. Lancelot - University Pierre et Marie Curie, France
M. Langseth - Lamont-Doherty Geological Observatory
M. Leinen - University of Rhode Island
(replaced by alternate R. Larson 30 Nov.- 2 Dec.)
J. Malpas - Memorial University, Canada
N. Pisias - Oregon State University
T. Shipley - University of Texas at Austin
A. Taira - Ocean Research Institute, Japan
B. Tucholke - Woods Hole Oceanographic Institution
U. von Rad - BGR, Federal Republic of Germany
J. Watkins - Texas A&M University

Liaisons:

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

Panel and Committee Chairmen:

J. Austin - Atlantic Regional Panel
M. Ball - Pollution Prevention & Safety Panel
I. Dalziel - Tectonics Panel
R. Detrick - Lithosphere Panel
L. Mayer - Sediments & Ocean History Panel
T. Moore - Information Handling Panel
K. Moran - Shipboard Measurements Panel
G. Mountain - Site Survey Panel
D. Rea - Central & Eastern Pacific Panel
R. Schlich - Indian Ocean Panel
C. Sparks - Technology & Engineering Development Committee
B. Taylor - Western Pacific Panel
P. Worthington - Downhole Measurements Panel

Guests and Observers:

D. Falvey - BMR, Australia
R. Ginsburg - University of Miami (2 December)

B. Haq - National Science Foundation (30 Nov.- 1 Dec.)
B. Harding - ODP-TAMU Engineering
H. Jenkyns - Oxford, United Kingdom
E. Kappel - Joint Oceanographic Institutions, Inc.
S. McGregor - National Science Foundation
N. Shackleton - Ocean History Panel
M. Storms - ODP-TAMU Engineering
E. Suess - Sedimentary and Geochemical Processes Panel

JOIDES Planning Office:

P. Cooper - Science Coordinator
L. d'Ozouville - Executive Assistant and Non-U.S. Liaison
H. Iwamura - Secretary
G. Waggoner - Science Coordinator

Monday, 28 November 1988

741 Introduction

New PCOM Chairman Ralph Moberly called the 1988 Annual Meeting of the JOIDES Planning Committee to order. Chris Harrison welcomed everyone to RSMAS and the University of Miami and expressed his gratitude for both the involvement of new blood and the continuity represented by old familiar faces. Moberly commented that Chris Harrison was an effective former member of PCOM. Keir Becker, who was acting as host for this meeting, extended his welcome and explained logistics including two dinner parties. An informal field trip led by Bob Ginsburg was planned for Wednesday noon to visit local outcrops of an oölitic limestone.

Moberly stated that the new staff of the JOIDES Planning Office at the Hawaii Institute of Geophysics hopes to be as useful and accommodating as was Nick Pisias's office at Oregon State University. Introductions were then made starting with the JOIDES Planning Office, PCOM members, panel chairmen, liaisons, invited guests and observers.

742 Minutes of PCOM Oxford Meeting 23-25 August 1988

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

J. Malpas asked for a correction to p.14 of the minutes (p.16 of agenda book) changing the second sentence of the second to the last paragraph to read as follows (changes in **bold**):

> With a 10% increase, the Moho objective would **probably be** lost, and more emphasis **would be placed on science that can be carried out with existing technologies**.

U. von Rad asked for a correction to p.16 of the minutes (p.28 of agenda book) with the second sentence under Leg 123 reading as follows (changes in **bold**):

> L. Garrison reviewed the changes in Leg 123 due to the exchange of **Leg 123 site EP9E for Leg 122 site EP2A**.

B. Harding asked for a correction to p.6 of the minutes (p.18 of agenda book) with the first sentence of the third paragraph under Engineering Test Leg 124E reading as follows (changes in **bold**):

> The platform for the DCS has been fabricated and is scheduled to **depart for** Manila **on or about** 1 November.

PCOM Motion

PCOM approves the minutes of the 23-25 August 1988 Planning Committee meeting with amendments. (Motion Malpas, second Kastner)

Vote: for 15; against 0; abstain 1

743 Approval of Agenda

Moberly called for additions or revisions, and then for adoption of the agenda for the meeting. Pisias and Lancelot asked for minor revisions.

PCOM Motion

PCOM adopts the agenda for the 28 November - 2 December 1988 Planning Committee meeting. (Motion Pisias, second Leinen)

Vote: for 15; against 0; abstain 1

744 EXCOM Meeting Report

Both Moberly and Pisias attended the 13-15 September 1988 EXCOM meeting in Edinburgh and written summaries of the meeting of interest to PCOM are attached (Appendix B). Of special concern to PCOM, EXCOM commended PCOM for its consistent approach to developing the thematically driven planning process, and approved strongly the four points of consensus of PCOM at its Oxford meeting of how to proceed. EXCOM thought, however, that the specific wording of the PCOM motion for implementation was inappropriate. EXCOM's motion was, *At the November 1989 Annual PCOM meeting, and at subsequent meetings, PCOM will examine thematically reviewed proposals in any ocean, in order to plan a general direction of the vessel in the period after 1991.*

Pisias emphasized in his report that the two most important items of concern to PCOM were that (1) EXCOM approved the new advisory structure of JOIDES and the panel mandates were accepted almost as written with few revisions. EXCOM was concerned that the Site Survey Panel (SSP) should not review the merits of drilling proposals, so the wording of the panel's mandate was changed to reflect this. (2) EXCOM strongly endorses the concept that science proposals drive the ship, so that PCOM can continue to develop long-range plans.

Discussion

There was some concern that EXCOM Minutes are not distributed to PCOM members and Panel Chairmen. Moberly noted that PCOM members should have them available through their affiliated EXCOM representatives.

The misunderstanding about the role of the SSP in regards to the merit of drilling proposals was also discussed.

745 National Science Foundation Report

B. Malfait represented the National Science Foundation. A budget summary is attached (Appendix C). In his introduction Malfait noted that the change in administrations will have an unknown effect on NSF, but looks forward to the same generally favorable treatment for science as under the Reagan administration.

Status of the FY89 Budget

The total appropriation for FY89 for NSF's ODP program budget is $32.1M Of this $21.5M is budgeted for the U.S. contribution to ODP. Individual contributions by the international partners is $2.5M and total $15M The approved total budget for FY89 ODP Operations/Management program plan is $36.15M, with the increase of $150 K over the target level supported by U.S. funds.

NSF has budgeted $5.184M for grants to support U.S. research related to ODP programs, including 5 field programs in the Pacific and development of downhole experiments and instrumentation (see Appendix C). FY89 will mark the end of two years of high-priority support for studies related to the Pacific drilling program.

Projected FY90 Budget

FY90 (1 October, 1989 - 30 September 1990) contributions by the international partners has been increased by 10% to $2.75M and based on this increase the FY90 budget target of $38M appears attainable. JOI will be given formal notification in early January 1989.

In FY90 NSF will be giving high-priority support to field studies in the Atlantic and its contiguous seas as outlined in the November 1988 JOI/USSAC Newsletter. NSF tries to direct high-priority field programs two to three years in advance of the drill ship track.

Other Items

MOU between Canada and Australia has been signed. Canada and NSF are attempting to resolve problems in the wording of the draft MOU between Canada and NSF.

The EXCOM resolution supporting Soviet participation in ODP has been forwarded into the system but there is nothing new to report.

Staff changes at the Division of Ocean Sciences at NSF are:

M. Grant Gross (Division Director) on 1 year sabbatical.

Don Heinrichs has moved to Division Director.

Bruce Malfait will serve as Acting Section Head for Oceanographic Centers and Facilities.

Dave Epp has joined Bil Haq at the Marine Geology and Geophysics Program as Permanent Associate Program Director.

746 Joint Oceanographic Institutions, Inc., Report

T. Pyle reported for JOI, Inc. and reviewed the timing and the steps for making the FY90 program plan.

Early Dec. 88	PCOM. establishes science plan (the driving force of the program)
End Dec. 88	Science Plan submitted by PCOM chairman to JOI.
Early Jan. 89	Official NSF budget target to JOI ~$38M
Early Feb. 89	JOI "budget overview".
14-15 Feb. 89	JOI budget preview by JOI Board of Governors.
7-9 March 89	BCOM reviews budget and sets scientific priorities if there is not enough money to accomplish the proposed program.
April 89	NSF does a quick administrative review to guard against major omissions or misstatements.
2-4 May 89	PCOM meeting reviews if necessary.
31 May-June 2 89	EXCOM meets and approves program plan.
July 89	NSF final review.
August 89	NSF executes contract with JOI.
Aug./Sept. 89	National Science Board has no formal review this year but gets a briefing.
1 October 89	Start FY90 program.

FY90 Budget

Pyle then discussed the FY90 budget from the last program plan (Appendix D) noting that there are two categories of budget (1) standard budget and (2) special operating expenses (SOE). The SOE part of the budget is designed to improve the program with new or special things such as leasing an escort ship during Antarctic drilling, replacing drill pipe, and purchasing the mining coring system. For FY90, $1.25M was budgeted for SOE, but only $68K remains uncommitted. Pyle noted that there is little flexibility in the FY90 budget. Problems to be faced in the FY90 budget include:

Avoiding higher extrapolation of funds available in FY91.

SOE includes only $150K for Hard Rock Guide Bases (HRGB).

If 2 HRGB are needed cost estimated at $800K

Other SOE:
$400K Mining Coring System (enough?)
$200K Drilling Supplies (HRGB?)
$350K Drill String Replacement (10K ft.)
$150K Shipboard Equipment Upgrades

Uncommitted SOE only $68K.

2 subsequent day-rate increases for the JOIDES Resolution are not included. Day-rate increases are tied to the Producer Price Index which went up again in November 1988. Increases in the PPI cost about $500K and are tied to budget size.

Logging insurance (premium and deductible) rate increases are not included in the budget. Premiums have increased x4-5 ($28K to $139K) and the deductible has more than doubled ($20K to $50K) since an "aggressive" logging program has been implemented.

Fuel costs have remained fairly constant and may provide some flexibility in the budget.

Additional Information Items

A policy on "fishing" for lost logging instruments has been established (see agenda book p.213-217).

U.S. logging schools have been established to coincide with various scientific meetings (GSA 1988 Annual Meeting in Denver, AGU 1988 Fall Meeting in San Francisco, IGC meeting next summer in Washington).

A logging practices meeting was held between LDGO, TAMU, Schlumberger, and SEDCO on 24 October 1988, to improve communications about what happens aboard ship, who is responsible for what, and who talks to whom, and generally improve decision making during logging. A six month trial of the new structure will see if there is an improved record of fewer tool losses.

Minutes from the 11 October 1988 Nansen Arctic Drilling Project meeting in Bremen, FRG are attached to the minutes (Appendix E). Pyle suggests cooperation between ODP and this project could strengthen the program.

News related to the U.S. Science Support Program of general interest to ODP are:

One proposal for a wireline reentry program has been received and is currently out for review and decisions are expected in several months.

A CD-ROM of DSDP data is due for release in late Feb./Mar. 10 copies will go to national program offices and international partners for distribution as they see fit.

A USSAC sponsored synthesis of EPR data is complete and will be presented at the 1988 Fall AGU Meeting in San Francisco.

Pyle emphasized that Panel Chairmen must send their minutes to JOI under pain of no funding.

Discussion

Leinen questioned the $800K cost for 2 HRGBs. She said that Dave Huey told CEPAC that the costs have decreased substantially. It was suggested that roughly 5-6 HRGBs could be purchased for $150K. It was noted that the $800K cost for 2 HRGBs was not only for the purchase of the guidebases, but included all costs associated with deploying and using these items.

Moberly asked Barry Harding to provide PCOM with a new estimate of the cost of HRGBs, for long-range planning.

Pisias asked about a cost analysis for logging holes drilled with the Diamond Coring System with slim-line tools versus making bigger holes. Garrison said this analysis was being done. Anderson said that redesigning the present logging tools with a slim-line design is too expensive. The options are to rent those slim tools available and lose logging data, or ream out the holes to make them larger and use the present logging tools.

747 ODP Science Operator Report

Lou Garrison gave the Science Operator report in two sections, first reporting on the JOIDES Resolution, and then on TAMU.

Leg 124

Leg 124 (SE Asia Basins) is now in progress with drilling at site CS-1 (Site 767). Three holes have been drilled at this site:

A Hole	Completed.
B Hole	Drilled to 739 mbsf, logging only partially completed due to hole troubles going down. Recovery was good at top and about 30% at bottom of hole.
C Hole	Drilled to basement 794 mbsf, recovered a few grams of basalt from 20 cm penetration in last core. Drilled through alternating terrestrial, calcareous and volcanic ash turbidites. Age of oldest sediments not clear, but Oligocene sediments were recovered above basement. Twelve cores were recovered and while coring the 13th the drill string became irretrievably stuck in massive turbidites and the pipe had to be severed.

While on site Co-Chiefs requested that the priority of the Sulu Sea holes be changed from SS-3 which is thought to have abnormal contaminated basement to SS-2 which may have a more conventional basement. Moberly (for PCOM) and PPSP agreed to the switch.

Other JOIDES Resolution Items

The scheduled port call between Leg 126 and 127 has been changed to Tokyo from Yokohama. Yokohama proved unsatisfactory because a bridge prevents the Resolution from entering the main port and only one outlying berth can accommodate the ship. There were also hotel problems. There will now be Tokyo I and Tokyo II port calls.

Shipboard computer upgrades will begin on Leg 124E and be completed by Leg 125. Upgrades include: 2 new VAX 3500 computers (Older 11/750 computers also remain on board), new disk servers, 2 optical disks one on board ship and one at TAMU (to reduce dependence on magnetic tape), Local Area VAX Cluster (a new configuration control using software to cluster VAXs into essentially one computer), 2 Macintosh-II computers, 2 Macintosh-SE computers, and 1 NT LaserWriter.

To try to improve the resolution of the 3.5 kHz seismic records a new sonar dome has been installed forward of the moon pool. A test of the new system on Leg 123 showed improvement, with 38 meters of bottom penetration with structural data while the the ship was making 13 knots in 4800 meters of water.

A new multi-sensor tracker system will be installed on Leg 124E in the Physical Properties Section. This system runs a whole core section through the GRAPE/P-Wave Velocity/Magnetic Susceptibility logger and gives a single readout of the results in one pass.

Staffing of legs proceeds apace. Both Legs 125 and 126 are almost fully staffed except for a foram person on each leg; additionally a sedimentologist and logging scientist are needed on Leg 125 and a VSP person on Leg 126. The invitations have been mailed for Legs 127 and 128 but Canada/Australia participants are still needed. Logging scientists for Legs 127 and 128 have not been invited pending PCOM prioritization of the logging needs. Leg 129 is not staffed since it depends on how many Nankai Legs are planned and the prioritization of drilling sites. The safety review of Leg 129 holes is complete.

ODP-TAMU

Four new Staff Scientists will be coming on in 1989 to replace staff members who have left. Tom Janecek from LDGO has been hired as a sedimentologist, Laura Stokking from Scripps as a paleomagnetist, Andrew Fisher from RSMAS as a logging scientist and Jamie Allen from Univ. of British Columbia as an igneous petrologist.

There has been an administrative restructuring at ODP-TAMU with Data Base moved from Science Services to Science Operations since Science Services was too getting too big and a more equitable distribution of the work load was desired. Data Base now reports to Audrey Meyer. IHP will now go through different channels as well.

A laser video-disk is being published with archival images of all cores from Legs 1 through 121 of both DSDP and ODP. The charge for this has not been set.

Discussion

von Rad wanted to know if notices of ODP Staff openings were sent to the European science community. It was established that advertisements of openings go out on an international level and are advertised in international journals.

Cowan wanted know about the status of drilling in Indonesian waters since lack of clearance prevented Banda Sea drilling. Garrison said this matter was beyond ODP's ability to handle and requires the negotiation of an overall MOU by the US and Indonesia. It was largely a political issue and not an objection to drilling.

Austin asked about the status of Part B Publications. Garrison said that Part B (Scientific Results) for Legs 101 and 102 are supposed to be ready for distribution in early December; Leg 103 ready for distribution at end of December; Leg 104 will be distributed in June. The time gap between December and June is the result of hesitancy on the part of PCOM and EXCOM as to how publication should proceed. There is a glitch in Leg 107 assembly because of the establishment of the Editorial Review Board (ERB). The poor quality pictures of the Leg 113 cores is the result of a cost cutting attempt to use unglazed paper which resulted in the publisher overinking and producing blurring. For the next volume (Leg 116), ODP will experiment with using unglazed paper for the body and glazed paper for photos of cores. The plates will be placed at the end of the book. ODP would like to know whether or not this method meets with approval.

Kastner wanted to know if Leg 113 Part A publication will be redone. Garrison indicated that it would remain as it is. A decision was made to get out the volume on time even with the poor quality pictures.

Schlich commented on the deficiency of the geophysical equipment aboard the Resolution, especially the poor bathymetry on site and loss of seismic lines above 5 knots. He noted that the types of problems found on the ship have been solved by other oceanographic institutions for their vessels.

Garrison noted that ODP at TAMU is aware of the shortcomings and improvements are being made (*i.e.* new sonar dome) but budget constraints are limiting what can be done. ODP is working on purchasing a

real time navigation system which will give smooth plots within 24 hours. Garrison stated that gathering high speed seismic lines between port and remote areas is not a role for ODP since they do not have the ship time available or the money to invest in a high speed streamer.

Schlich also noted that magnetic field results cannot be examined onboard ship since there are no programs to reduce the magnetics and this means important magnetic data is not available for making drilling decisions and may be lost entirely due to equipment malfunctions no one is aware of.

Garrison said that real time processing is a problem for which suggestions are needed and which could come from the new Shipboard Measurements Panel.

Shipley and Pisias both noted that SMP is to report to PCOM, which will establish priorities. Further discussion was held about the role of SMP and formation of liaisons with other panels (*i.e.* SSP). Moberly asked K. Moran to talk to R. Schlich and G. Mountain about the problems with shipboard geophysical measurements.

von Rad suggested that a narrow beam echo sounder should be installed to image the seafloor better, since the old fashioned wide beam system now onboard has side echo problems.

748 ODP Wireline Logging Services Report

R. Anderson gave the quarterly status report for Wireline Logging Services for the Borehole Research Group at LDGO (Appendix F). There has been an increased amount of time devoted to logging of holes since Leg 101. The side entry sub (SES) suggested by Lamar Hayes to get the logging tools to the bottom of the drill string has proven an extremely successful method for Legs 122, 123 and 124. Anderson suggests that the name "Hayes SES" be adopted both to recognize the efforts of Lamar Hayes on behalf of ODP and his suggestion of the technique.

Bridging continues to be a problem for logging holes. Clay swelling does not appear to be the cause. It appears to be a problem with sand caving into the hole. The solution is to use the SES. Logging tool bashing has not been successful and only results in tool loss.

Logging of Leg 122 holes found that Si, Ca, Al measurements correlate with the Haq and Vail sealevel curves, reflecting the changes in sand input.

Logging of Leg 123 site 766 hole downslope and west of 761 and 762 has shown the value of geochemical logs for stratigraphic correlation between holes. Because the hole had to be cased the planned experiment to compare logging through pipe and outside pipe could not be conducted. This will be tried on Leg 125.

Hole 765D provided good breakout data (breakouts in direction of least compressive stress) with the stress orientation the same as at 90E Ridge (site 758) but of greater magnitude. These experiments represent an important development in worldwide stress measurement mapping.

The French-made Slim Formation Microscanner will be shipped from the manufacturer around Christmas. The computer system has been received and software is under development, and the system is anticipated to be operational for Leg 126.

Testing of wireline packer is nearing completion and deployment on Leg 126 is anticipated. Changing the design of the steel reinforced braiding of the bladders has fixed the closure problem. New problem is the pumps keep burning out. The maximum life for motors and pump is 8 hours. The motors and pump were subcontracted to Stanford. M. Zoback is trying to solve the problem by getting AMOCO to let ODP use its design. The tool started out as the AMOCO Wireline Packer and used their own 1.5 HP motors. The ODP design uses TAM International motors which are only 3/8 HP and which are inadequate for the job. M. Zoback is negotiating for the use of the AMOCO motor or if that fails they will jury rig 4 TAM motors in series. The packer was supposed to be deployed on Leg 124E but will not be ready. The delay is the

result of the need to field test the jury rigged 4-motor setup at Lamont, which is scheduled for the first week of December in a borehole in basalt. The design failure is blamed on Stanford and should have been spotted before the field tests. The problem arose because the instrument was assembled as individual components with each component working separately, but when fully assembled the tool was not capable of doing its job reliably. [Late word by Anderson was that AMOCO would let ODP use the motor design and the on-land test was back on schedule.]

Discussion

Taylor asked if K. Becker's packer could be used if necessary on Leg 126. Becker said yes. Anderson said the wireline packer will be ready to test by Leg 126.

von Rad noted that there have been lots of tool losses and failures causing complete unpredictability of logging time requirements. He suggested better maintenance of tools during the 5 days of port time. Anderson replied that Schlumberger cannot maintain their own test schedule because of the distance of the ship from Schlumberger Maintenance Districts. This is compensated for by carrying 2-3 backup tools. Schlumberger says shipping is the primary source of tool damage. Auxiliary Measurement Sonde has been failing a lot, causing the system to shut down, and may no longer be used. The problem is related to a failing splice required by the use of the crown block. Also, the swivel head has been leaking.

Moberly asked if you had to use the crown block. Anderson indicated it was necessary for safety reasons (heavy cable). He also said there was a full maintenance call by Schlumberger (expensive) last time in Singapore and all the tools were checked out as OK. He emphasized that tools should not be used as bashers, they're built to withstand significant horizontal banging, but not vertical. Most of the problem may be the rugged environment downhole. A set maintenance schedule will not solve the problem. Another part of the problem is a lack of logging time allowed; there just isn't any time available to thread a new tool after one fails.

Francis asked if the main problem is heave. Anderson said that heave mainly affects data quality. The engineers' hypothesis is that the main problem is "bashing" through bridged holes by users.

Taylor asked what could be done regarding the Auxiliary Measurement Sonde problems. Anderson said assemble tool ahead of time and test it in a "mouse hole" before the SES is deployed.

von Rad stated the chief scientists need real time figures so they can plan logging programs. At present one should multiply standard figures by factor of 2. It is possible to miss one's objective because of these timing errors.

CS-1 was an example of the value of the new policy of logging holes before reaching full depth on deep holes. The logging took 2.6 days but it was important because core recovery was very poor and the drill string got stuck.

Shackleton stated that there is a need for more information in the open literature regarding the benefits obtained from logging. Anderson said Volume 3 of the Logging Manual contains a lot of information from the backlog of logging manuscripts. Because of the restrictive ODP publication policy there has been trouble getting logging publications out.

Moore & Pisias both stated that publication in the open literature with all 42+ authors could and should be done. It was noted that Leg 111 logging data were published in Reviews of Geophysics.

von Rad suggested that logging information should be combined with paleontology and sedimentology information.

Shackleton noted that the logging manual has a lot of information useful to chief scientists.

Anderson said that Volume 3 of the Logging Manual has a lot of science in it but was intended to be an educational volume using examples from ODP legs.

749 Regional Panel Reports

Atlantic Regional Panel

J. Austin gave the report of the Atlantic Regional Panel. The panel has not met in 18 months. Former PCOM Chairman N. Pisias wrote a letter to Austin asking for an evaluation of the "ready-status" of drilling programs in the Atlantic. The purpose was to identify a small set of scientific drilling objectives that had nearly mature proposals and assemble a set of new thematic programs based on recent workshops. Additionally they were to make the community aware of plans to drill in the Atlantic. The preliminary assessment was included in the agenda book starting on p. 177. With the exception of Leg 101 proposals, previous drilling did not answer all high-priority thematic objectives of the mature proposals previously submitted and further drilling related to these programs is envisioned. The regional thematic white paper generated by ARP also identified new drilling objectives in the Atlantic. Workshops sponsored by JOI-USSAC have also identified new thematic objectives in the South Atlantic and Adjacent Southern Ocean (J. Austin convenor) and in the Caribbean Sea (R. Speed convenor). Four workshops held in Europe have also identified new thematic objectives: (1) "Geologic History of the Polar Ocean: Arctic versus Antarctic" convened by J. Thiede; (2) "Mediterranean Workshop" convened by J. Mascle; (3) "U.K. Proposals for ODP: Atlantic Ocean" convened by NERC; (4) "Drilling in the Atlantic" convened by ESF. Austin noted that the Europeans are taking very seriously the PCOM initiative to open up drilling in all oceans based on thematic objectives. The U.S. response has not been as large.

Discussion

von Rad questioned why Leg 101 was left out of the summary of old legs. Austin said the purpose was to outline high thematic priority work that still needs to be done and Leg 101 accomplished its drilling objectives.

Cowan wanted to know what can be done in 1990-91 that hasn't already been done to investigate continental breakup? Is drilling deeper all that is needed, or is it a waste of money? Austin said the French are particularly interested in identifying the S-reflector. At present we cannot address all phases of breakup, and further drilling is needed.

von Rad said the deep stratigraphic hole in the Moroccan Basin is not mentioned. Austin said that in a phased program a deep stratigraphic test does not have a high priority in an early phase and these holes cannot be easily attempted with the ship in its present state. It would also be a safety nightmare.

Eldholm wanted to know what a return to volcanism drilling means? Austin said that the document considers the North and South Atlantic as good places to test plate kinematics and the hotspot reference frame and that the margins are good places to look at anomalous volcanism and its effect on continental separation.

Moberly asked if the report on p. 177 of the agenda book constituted the ARP Annual Report. Austin said that without a panel meeting in 18 months this was it.

Southern Ocean Panel

Moberly conveyed P. Barker's apologies for not being able to attend; a written report is attached to the minutes (Appendix G). Barker wanted it emphasized that remote areas may get neglected and remain neglected if their proponents of drilling perceive that it is a hopeless cause and may thus become a self-fulfilling prophecy. It may be equated that if there are no advocates in the panel structure then there will be few new proposals.

(Pisias noted that a major change in the panel structure is that proponents no longer rank their own proposals.)

N. Shackleton was asked to give the SOP report. He suggested that PCOM read Barker's report as he was not prepared to discuss it in detail. Shackleton noted that: SOP has not met in 12 months; there is a

list of Antarctic proposals in the system; it is not true that SOP proposals have been the only proposals drilled in the Southern Ocean.

Discussion

Pyle asked if it was true that the number of scientists in the advisory structure is being reduced. Pisias noted that while 3 regular panels have been eliminated, two new panels and one DPG were added.

Indian Ocean Panel

R. Schlich gave the IOP report, noting the last meeting of the panel was October of 1987. Since that last panel meeting, drilling at site 735 has recovered 500 m of gabbro. Schlich requested a final meeting of the IOP. He gave the history of the problems of putting together this final meeting of the panel and Chief-Scientists from the Indian Ocean legs, which was to have provided Pisias with help in a part of the Long-Range Planning Document. The final panel meeting is now requested for a time after the panel is officially disbanded (31 Dec. 1988). The purpose of the meeting would be to document the achievements of drilling in the Indian Ocean and identify the remaining problems to be addressed by thematic panels.

Discussion

Kastner said it is a good idea, that there is a need to publish these results in the general science community. She suggested publication of a summary of the main achievements in EOS. Moberly said there is pressure to get out the important thematic summaries and he would note this suggestion.

Lancelot said this is extremely important especially since results will not be out for some time and since ODP volumes do not get highly publicized. Lancelot suggested publishing a small volume of some kind which could come out as a scientific report of this drilling phase. He suggested January would be the right target date for this meeting. Publication of these drilling results will help answer questions asked by France about where the scientific results are published, how can it be proven the project is well run, and how is the money being spent?

Kastner said that USSAC is going to have a meeting to discuss the problems of thematic publications and EOS-type articles, and the need to get results of drilling out more quickly.

Pisias wanted the IOP meeting to provide an evaluation of what was planned versus what was achieved by drilling.

Langseth suggested that this meeting might be held in a workshop setting to get publication outside of the planning committee.

Mayer noted that two sessions at the IGC in July will be devoted to Indian Ocean drilling.

Francis wanted to know who is being addressed in producing this publication. Is the EOS article to be something other than a collection of Geotimes articles?

Pisias said the intention of the article is to put Indian Ocean drilling in a larger perspective with cross-leg links and not a leg by leg summary.

Schlich agreed with Pisias and noted that it is important to examine Legs 119, 120, and 121 together for future reference.

von Rad said there are two completely different objectives here (1) discuss what has been achieved by drilling and (2) what are the gaps in what we want to achieve in a long-range document. A workshop would be very useful but these objectives can be fulfilled by a follow-up meeting of the panel.

Mayer said this would be a healthy exercise. IOP was planned as a regional exercise but it would be good to see everything synthesized in terms of thematic objectives.

Pisias noted that calling it a workshop may open the door for proliferation of DPGs and workshops. A meeting of the panel could provide what is needed especially since you can't go through a workshop

format in a timely manner. Expectations regarding output should be formalized. The end of a panel's life could be a time to produce these kinds of documents.

Francis noted that the general public is not interested in details of whether or not planning worked, but how much ODP has contributed to improving our knowledge of the Indian Ocean. We should begin with what was known before drilling started and what drilling achieved.

Schlich requests a clear message from PCOM regarding the IOP meeting.

Langseth said the workshop suggestion was designed to get the publication out from under the JOIDES umbrella.

Kastner voiced two objections to the workshop type format (1) as Pisias noted it is not a timely way and (2) it reestablishes the concept of a regional panel. The JOIDES intent is to have thematic panels establish what thematic issues can be studied in what ocean. What is needed is a summary of scientific achievements of drilling, not a workshop. Schlich noted that this was his original request.

Lancelot said something must be published extremely soon, no matter what format. Put Schlich in charge and do it.

Shackleton said he doesn't see how you can make a useful publication given the publishing constraints imposed by ODP on the scientists involved.

Moberly noted that there is a great deal of difference between a volume (whatever a volume is) and one of the fairly long news items in EOS.

Moore said there are two ways to approach a summary of Indian Ocean drilling, under the existing publication policy: (1) the volume mode with two pages listing all authors on all legs, or (2) the short EOS-type article with references to individual leg volumes or Geotimes articles as sole references for the synthesis. The second option doesn't draw on any more data than are already out.

PCOM Motion

> In light of the requests from both the NSF review and EXCOM that the thematic successes of ODP be highlighted and summarized, I move that a subcommittee of PCOM meet to discuss the possibilities for doing so and recommend some scenarios for summaries. (Motion Leinen, second Kastner)
>
> Vote: for 11; against 4; abstain 1

Moberly appointed Leinen as chair of the subcommittee with Pisias, Lancelot and Taira members. Moberly asked that a focussed set of three or four choices, directed towards publication, be prepared. If a workshop format were chosen as an option, suggestions for specific charges should be made. A brief report is to be given on Friday during the agenda section on resolutions and new memberships. (Note: Leinen and Lancelot had to leave Miami early; there was no report on Friday.)

Shackleton thought it would be more useful if separate thematic reports were written including one on Ocean History findings in the Indian Ocean.

Moberly said that was the intent, to try and get away from a lot of nonthematic reports. (See further, Minute 767)

750 Advisory Service Reports

Site Survey Panel

G. Mountain gave the SSP report (Appendix H) in three sections (1) How the mandate was fulfilled in 1988; (2) Assessments regarding FY90; (3) Comments on future role. Site Survey Standards are given in the new Guidelines Special Issue of the JOIDES Journal which will be published soon. Carl Brenner was commended for his efforts towards data deposition.

Site survey reviews for scheduled WPAC legs are now generally satisfactory, except for: Leg 126 where high heat flow in vicinity of BON1 means care is needed in final site selection; Leg 127 where basement at J3b needs better imaging.

For unscheduled WPAC programs, site survey reviews have identified problems for: Lau Basin which needs redefinition of objectives based on new Gloria data; Vanuatu where site DEZ-2 has a continuing problem with the velocity structures and depth of drilling to the décollement objective; Geochemical Reference Sites do not have final locations for BON-8 or MAR-5.

Based on site survey reviews the CEPAC Programs have been divided into five categories: (1) Adult; (2) Adolescent; (3) Child; (4) Infant; (5) Gleam-in-the-eye (see Appendix H).

In the future SSP needs at least a 3-year lead time between receipt of initial data package and drilling. Moberly noted that PCOM is supposed to plan the general track of the drill ship 4 years in advance, but it is doubtful that SSP will get more than a 3-year lead time.

Liaisons with PPSP and DPGs on an "ad hoc" basis are important for timely input. TAMU engineers should provide feedback on the following issues: (1) the need for geotechnical core information at reentry sites; (2) risks associated with high temperature environments and the boundary conditions for drilling; (3) clarification regarding safety boundary conditions for bottom currents (>1.5 knot ?).

Discussion

Lancelot said that there will be a cruise to the Pigafetta Basin in July to August which will survey PIG1-4 and EMB2. Mountain noted that this is getting late in the year for processing the data for a site review.

The SSP characterization of the CEPAC programs drew considerable comments. Taylor and others questioned the SSP maturity assignments, including Sedimented Ridges and EPR Bare Rock drilling proposals as gleam-in-the-eye. Detrick said that EPR and Sedimented Ridges have some minor deficiencies but Middle Valley has a comprehensive data set available. Middle Valley needs deep MCS to image the magma chamber reflection, but this is not essential for the drilling objective. More geophysical studies are pending: Earl Davis for sedimented ridges; Hayman and Fornari for EPR. Langseth noted that Middle Valley is a paragon of site survey data. There are also abundant survey data on the EPR.

Detrick said that in drilling near fracture zones there is a need to know what rock type is present (peridotites, gabbros, basalts) and therefore sample recovery is important. On the EPR, siting of the guidebase is less dependent on rock type and more dependent on the structural setting.

Mountain asked if SSP should decline comments from persons like Ballard or others who suggest new technologies (*e.g.* Argo-Jason). Moberly said any information you can provide PCOM is valuable so SSP should take advantage of any information anyone wants to supply. There is however but a limited amount of money available to bring these persons to panel meetings. Pisias said it was suggested that Ballard should submit a proposal to do these surveys. Austin noted that R. Hayman got support from the competitive sphere (NSF) to use the Argo to survey at 9°30'N on the EPR. This speaks eloquently about the calibre of science generated by these techniques for ODP.

Langseth noted that proponents of new techniques should not go to SSP for money. Certain types of drilling require a properly set guide base, and it is appropriate for SSP to be asking what type of site requires what kind of detail. SSP may need to go on a case-by-case basis for setting the guide bases. Mountain also noted that in the new Site Survey Data Matrix the term bottom photography has been replaced with bottom imaging so that the category includes a number of new techniques.

von Rad noted that the SW Indian Ridge drilling is a good example of a badly setup program. The IOP had said it was not a suitable site.

Dalziel said the Nankai Leg has been checked off by SSP while TECP has suggested additional data are needed from a thematic point-of-view in order to understand processes properly. Drilling objectives may need to be modified. Mountain said this is an example of why liaisons are needed with panels in order to keep informed about changing drilling objectives. Lancelot and Shackleton also commented on the usefulness of liaisons.

Lancelot wanted to know if SSP has the responsibility to advise ODP-TAMU about necessary ship equipment so that sites can be drilled properly. Moberly indicated that this is the responsibility of DMP and the new Shipboard Measurements Panel (SMP).

Downhole Measurements Panel

P. Worthington gave the DMP report. In his introduction he noted that the DMP views its function as about 70% service and 30% thematic. Panel membership breaks down along the lines: 4 from oil industry, 3 from JOIDES institutions (would prefer a bit more), 4 from other Universities, and 4 from government labs and institutes.

DMP has been trying to educate the community about the value of logging and is concerned about the recent statement that "If you have continuous core recovery you don't need logs". Logging provides information not available in cores, such as characterization at *in situ* conditions and of volumes considerably more than core.

Purpose of DMP is to make recommendations to PCOM and they do appreciate a reply to their recommendations. In 1988 they made 22 recommendations to PCOM and the following actions were taken: 15 accepted; 2 to ODP-TAMU for information; 2 referred back to DMP for further information; 1 not discussed (Accept Formation Microscanner dedicated scientist on the first leg that this tool is run); 1 rejected (Nankaii Working Group); and 1 on hold pending cost analysis (Slim-lining tools versus enlarging DCS hole).

DMP has adopted these guiding interests of a thematic nature: (1) Composition and structure of crust; (2) Hydrogeological characterization; (3) Lithospheric stress on a global scale; (4) Sediment cyclicity; and (5) Temporal emphasis for monitoring of modern geological processes. These themes are used as guides for determining downhole measurement logging needs. They allow provisions for non-standard logging measurements when initial leg drilling strategies are being devised.

Future downhole measurement objectives (Mid 1990's) are: (1) Measurements-while-drilling technology (*i.e.* resistivity, natural radioactivity) and (2) Interwell tomography.(extending measurements beyond wells)

The COSOD II DMP white paper on downhole measurements and the scientific value of logging has been submitted and accepted for publication in Basin Research.

DMP emphasis for 1989 is to improve log data quality by monitoring of 3rd party tools, supporting improved tool maintenance by Schlumberger at remote locations (Schlumberger invited to next DMP meeting), furthering logging through pipe, requesting a meeting of logging scientists and contractors (requested for March 1989), and finally to improve tool calibration (most are calibrated for carbonates, not sandstone or basalt).

A major concern is that the Diamond Coring System 4" hole prevents certain tools from being run (*e.g.* full-waveform sonic, VSP, wireline packer, lithodensity tool, geochemical logging tool, borehole gravitometer, magnetometer, induction tool, formation microscanner, thermal neutron porosity tool). DMP does not see the sole purpose of ODP drilling to be the acquisition of deep material, but to acquire a balanced package of information including core, logging data, VSP data and to provide linkages to geophysical data. The loss of the use of these tools must be very carefully considered.

Discussion

Kastner asked if there are slim-line versions of these tools. Worthington said that there are slim-line versions for the sonic (but just get velocity, not waveform), resistivity (induction lost), basic porosity and density tools, and could develop gamma ray tool. If ODP is content to accept what is currently available in slim-hole tools this would be going back to what was considered a useful suite ten years ago and saying goodbye to what is available today.

A question was raised about how long it would take to develop slim-line versions of what is available today. Worthington replied that some tools cannot be slim-lined and for others the cost would be horrendous. Kastner wanted to know the cost of development. Worthington replied that for slim-lining the Formation Microscanner ODP contributed $150K of the total $500K spent by Schlumberger.

Pisias asked what is the minimum hole size acceptable for logging. Worthington said 5.5 to 6 inches based on the drilling at the KTB site in Germany. A table is given at the back of the June DMP Minutes with the diameters of the logging tools. Harding noted that the larger the hole diameter, the harder the drilling gets and the more unstable the hole.

Downhole Stress Using Borehole Televiewer

A further concern of DMP is the delayed acquisition of the Digital Borehole Televiewer. DMP sees downhole stress measurements to produce a global stress map as a major driving force for ODP and one of their high-priority thematic concerns. Existing Analog Borehole Televiewers cannot support the logging program. BCOM has approved acquisition of the Digital Borehole Televiewer in FY92. Therefore DMP suggests that it is important to advance the purchase of the Digital Borehole Televiewer by two years. The Digital Borehole Televiewer is the next logging tool in line for purchase, since there are no purchases scheduled for FY90 or 91. Another option is to make an arrangement with the FRG manufacturers of these devices.

Discussion

Taylor asked about the difference between the Analog Borehole Televiewer and the Digital Borehole Televiewer. Anderson noted that the analog tool is not durable and breaks down consistently while in the hole; on the other hand the digital tool is reliable.

Pisias asked about the cost of the Digital Borehole Televiewer. Anderson said the cost was about $80,000 for 2 units.

Francis wanted to know how many Digital Borehole Televiewers are needed to ensure that this service is reliably supplied. Anderson replied that a minimum of 3 Digital Borehole Televiewers is needed for the logging program. Mountain asked how much more reliable is the Digital Borehole Televiewer compared to the Analog tool. Worthington indicated the digital tool was an order of magnitude more reliable.

Dalziel wanted the reason for delay in purchasing the televiewer. Worthington said it was a budgetary problem. The initial priority budget item had been the formation microscanner. The difference between the two instruments is that the microscanner is not specifically designed to look at breakouts while the televiewer sees the breakouts and determines their direction. The use of the instruments is complimentary. (Note: On Friday PCOM reaffirmed that the Digital Borehole Televiewer tops its proposed use of SOE funds.)

Another budgetary constraint has arisen because high temperature logging tools have to be rented for upcoming legs. Rea wanted to know if any slim-line tools work at high temperatures. Worthington said 3 high temperature tools were available. A discussion about design constraints for slim-lining tools followed. Most problems associated with slimming tools involve keeping the electronics cool and poor counting statistics associated with decreasing the size of detection crystals. Kastner wanted to know why the

high temperature logging tools had to be rented and if this was cost efficient. Anderson said that Sandia gets $50K for the use of their tools, while the actual worth is much greater.

von Rad wanted to know when Volume 3 of the Logging Manual would be available. Anderson said that they will be mailed to JOIDES Journal receivers who got Vols. 1 & 2 and sent back the blue card in the front. Those who attend the logging school at AGU will get the color version while others get a B&W copy.

Pollution Prevention and Safety Panel

M. Ball gave the PPSP report (Appendix I). The mandate of this panel is to make sure ODP does not find oil or gas. Industry is heavily represented on this panel. Continuity is maintained by not rotating members off as do other panels. The 10 member JOIDES Panel chaired by M. Ball usually meets concurrently with a 3 member ODP-TAMU committee.

A safety panel meeting includes a review by L. Garrison of drilling legs since the last meeting. Co-Chief Scientists present the regional geology and geophysics, scientific objectives, and site-specific data for upcoming legs. PPSP is not adversarial; it wants to understand the science objectives so it can accommodate the science with changes made for safety reasons. Evaluation of potential for occurrence of hydrocarbons is defined using direct evidence (preexisting drilling) or indirect evidence (anomalies in amplitude, bottom-simulating reflections, structure, source, etc.).

Liaison with SSP has been useful, giving PPSP a chance to make contact with chief scientists well before a leg is finalized and improving the quality of safety reviews.

Discussion

Lancelot wanted to know if high temperatures were a safety problem and if safety limits in terms of maximum temperatures would be set. Ball said that they were not ready to set limits at this time but a study was being made of the mechanism for steam conversion. Garrison said that drilling engineers have been doing some modelling in cooperation with Sandia on the steam flash problem and that theoretical data do exist.

Pisias wanted to know if there were any safety concerns for the shallow holes for the NE Australia Margin. Ball said they did not see any problems for shallow holes; there are good seismic records and not much chance of hydrocarbons. PPSP also does not foresee any problems for Nankai, which is in very deep water and lacks reservoirs.

Kastner asked about the experience of drilling margins with clathrates and if PPSP had re-evaluated its policy. Ball said that decisions are based on prior experience with clathrates. Nankaii is near the downdip limit of clathrates. Bottom-simulating reflectors (BSR) indicate clathrates and have been avoided during drilling. Garrison said that at the last PPSP meeting von Huene talked about clathrates. The feasibility of setting up a test to get under a clathrate or through a BSR has been discussed but with no conclusions. Moberly suggested that with high-quality seismic and 3.5 kHz records, drilling in a syncline may be safe. Since proposals exist to drill clathrates, ODP will have to consider this possibility in more than the abstract. Ball said PPSP is worried about it from a safety standpoint.

von Rad said that PPSP should look at the Exmouth Plateau drilling where there was an extremely gas rich show, for which the shipboard party prepared a good summary for PPSP. Ball said that PPSP would like to look at that.

Moberly noted that with the success of the preview of the NE Australian margin as an example, future requests for "previews" of leg proposals will be well received, but PCOM needs to consider the total expenses for doing this. Ball noted that the preview is intended to indicate obvious problems.

Information Handling Panel

T. Moore gave the IHP annual report to PCOM (Appendix J). Highlights of 1988-1989 for IHP are: (1) ODP has added a copy-edit step to production of the Scientific Results volume as suggested by PCOM; (2) Four new Macintosh computers and a laser printer have been put onboard ship plus new graphics software (Largely through the efforts of R. Merrill); (3) Core photos are available on video-disk (Recommended price $50 slightly more than individual production cost); (4) DSDP data base available on CD-ROM (USSAC sponsored project). IHP proposes that the ODP data base be released in a similar way on a biannual basis; and (5) Letters to "non-performers" were drafted for PCOM Chairman's approval and have since been sent out by Moberly.

IHP will advise on the development of interactive on-board entry of data for: (1) Paleontologic data base (Using the Checklist II program which has a simple data entry menu suitable for shipboard use); and (2) Visual Core Description (current handwritten system is archaic and IHP recommends development of an up-to-date system that is easily convertible to a computerized data base).

Discussion

Malfait wanted to know how many letters to "non-performers" went out. Moberly indicated around 15. Moore said about 80% of "non-performers" are young scientists (graduate students) who go to sea with full intentions of participating but change job positions and no longer have time to spend on ODP obligations. Most are persons leaving academia for industry. von Rad wanted to know if the letters were being sent out as a warning. Moore recommended to ODP that the letter specify what are the consequences of not meeting the obligations now that the policy is in place, but before any action occurs. Eldholm wanted to know if the Chief Scientists were being consulted. Moore said the background to each case had been investigated but IHP and ODP did not want to publicize this list widely.

Pisias said he noticed in the minutes that "KERMIT" is used for file transfers. There are more efficient ways to transfer data and with the expertise available a better networking system should be found.

Publications:

Moore noted that PCOM dealt with the publications budget issue last year and now is going to address the issue of the timing of publications. A letter had been sent to panel chairs asking about the options available for speeding up publication. From a historical view the early goals of the DSDP and ODP publications policy was to: (1) tabulate locations and measurements, (2) collate and integrate drilling results, and (3) produce comprehensive, well-reviewed, high quality reports on results of each leg.

The proposed normal schedule for publication of the Part B Scientific Results Volume is:

	months post-cruise
Post-Cruise Meeting	4-6
Deadline for Manuscripts	18 (Publ. Part A)
Complete MS Review	22
Receive Revised MS	24
Complete Synthesis MS (Reviewed)	27
Type/Print (Paged)	32
Index	33
Publish Part B	36

The question is "Can this be speeded up?". ODP should be able to publish what comes off the ship in about a year (Part A now takes 16-18 months). A disadvantage for publishing quickly is that you lose the ability to reinterpret the stratigraphy and paleontology calls made onboard ship.

Discussion

Pisias wanted to know how much the paleontologists change their reports from leg-end to publication. Lancelot said there is very little change based on a summary he made at DSDP. Publication can be within a year without losing much of the stratigraphic control. Eldholm said that things may change in major ways after a Co-Chief has the manuscripts for final publication, but not by the post-cruise meeting stage.

Lancelot suggested that there is a need for an earlier meeting of the paleontologists to finalize barrel sheets to prepare for a post-cruise meeting. Moore said that the improvements in getting data into the data banks will help speed up the process. By eliminating the time spent going over the barrel sheets, more time becomes available for getting Part B done.

Kastner said that if the post-cruise meeting is eliminated the time could be better spent on the Part B volume. The letter to Panel chairs raised the question about a post-cruise meeting aimed solely at Part B in order to decrease the time before publication. Moore asked if there was a consensus that we should take what comes off the ship and publish that as Part A.

Schlich said it is not so clear that you can take what comes off the ship and publish, because it depends on the leg and disciplines involved. Some very fundamental problems are not solved in 4-6 months. You can't say there is no need to discuss volume A. The changes between volumes A and B could be great. Volume A is important to geophysicists who need stratigraphic information and cannot finish their work until they have it.

Taylor wanted to know what would be done on the upcoming WPAC legs where there is only 1 day from the last drill site to port. Austin said that it took only 12 hours to write both the Geotimes and Nature papers on his leg. Moberly pointed out that one does not have to wait until the last core is up to start writing the results.

Leinen said that a deadline for changes in biostratigraphy needs to be set. Erroneous biostratigraphy can lead to problems in interpretation. Moore agreed that biostratigraphy should be determined within a few months and then published.

Taylor wanted to know how the new formation microscanner scheduled to be deployed on Leg 126 for first time will effect data handling, since there has been no planning to accommodate this major increase in amount of data. Moore said that there should not be a major problem since the formation microscanner will not get used on every hole. Provisions will have to be made for displaying the data along side the core data.

Some Options for Speeding Up Publication

The biggest problem causing the publication delays is people not getting their manuscripts in on time. Options for speeding up the process going from least severe to most severe are: (1) Utilize the system in place now but reduce deadline time for manuscripts from 18 months to 12 months (and stick to it); (2) Publication of the results of individual scientists outside the ODP Volume B, once they have completed a fully acceptable MS (on the same topic) for the ODP Volume; (3) Independently publish all scientific results outside the ODP Scientific Results Volume B, which will then consist of a bound reprint collection. (Clarification note for option #2; accepted means reviewed with reviews incorporated into text, and is not the same as "acceptable".)

Discussion

Moberly said publication delays have been discussed in the past, but two recent high powered reviews of the program, while overall quite favorable, have both identified publication timeliness as a deficiency. We have to take this problem seriously.

Lancelot said we need to get good publications in the "real" literature and out of the "grey" literature. We should encourage people to publish in outside journals and publish Volume B as collected reprints along with the unpublished paleontology plates and other data.

It was said that missing deadlines for manuscripts is still the main problem.

Eldholm observed that it is very difficult to publish a Part A synthesis of a leg without the key data to a certain level, especially geochemistry data. There is a need to produce the Volume B scientific results.

Kastner said ODP needs to get the information out into the open literature. She suggests three publications: (1) Vol. A with shipboard results plus minor augmentation; (2) Vol. B like option #3 with data papers and plates; (3) Third volume with integrated syntheses of several legs, but not to be published by ODP, instead to be published by established journals.

Garrison observed that there was no new idea discussed here today. A policy must be adopted and stuck to. Constant changes in policy are what delays volume B. The PCOM must not back up and change the rules. Moore agreed with what Garrison said. We can reconsider our policies but should try them for some time first.

Pisias said that we need to make hard decisions about publications, otherwise it will continue to be viewed as "grey literature". EXCOM wants a lot of data in a volume, but we have only a finite resource to spend.

Moore said he is tired of the term "grey literature" for something that a lot of hard and conscientious work goes into.

Mayer said the problem is that since volume B does not exist at all its not even "grey literature".

Austin said that Part B Results for Leg 101 is a high quality publication. He cannot understand the level of criticism leveled at something that hasn't even been looked at. The publication is not that far behind schedule and it was realized by ODP from the beginning that it would take 36 months to publish.

Moberly said the criticism has been that no one has seen the scientific results coming out. ODP may have known that there would be a delay but the program reviewers did not know this. That's the crux of the problem. We need to give some help to the NSF people for future reviews by publishing the ODP volumes. There may not be a problem if there is timely publication of ODP results.

Lancelot said that Volume B is considered bizarre literature and not fully accepted as openly reviewed literature. There is a need to publish in open literature. The need is extremely well sensed by a lot of people. The literature is actually quite good, but no one reads it.

Francis affirmed the need to publish to keep the program operating.

Shackleton noted that a lot of good science goes into the ODP volumes that wouldn't make it into the open literature. It is ludicrous that we're talking about 18 months from manuscript deadline to publication. Modern technology should speed up the publication time.

Moore said we should not be too hard on the 18-36 month time frame, since by analogy the time of walking off the ship is the equivalent for some researchers as the time of getting notification that their grant has been funded. Therefore, 36 months to collect data and publish the results is not an unusual amount of time for publication of Part B Results.

Dalziel said the Antarctic research community had a similar experience, moving from in-house publication to the open literature. He suggested a memoir series to publish the kind of data that would not get published in the open literature.

Kastner said that even a high quality Part B is not an efficient way to communicate with the general community; we need to publish in the open literature.

Worthington said to (1) get timely and prestigious publication of scientific issues and (2) collect them into volumes. Make Part B a reprint volume of collated outside articles, other syntheses and data.

Rea noted that the "blue books" are treasures of data on ocean basins. Leg 92 was a spectacular success but only 11 papers have appeared in the open literature. This would make for a thin reprint volume.

Moberly noted that option 3 gives you the ability to publish outside, bind the papers and include the data. The bound papers cannot be called "grey literature".

Worthington noted that the reviewing load would be decreased by including reprints which are already reviewed.

Leinen suggested that the soon to be published Part B scientific results (which are reviewed literature of excellent quality) should be reviewed as a book in a journal such as Science to enhance the reputation of the books and the program. There was a general agreement that this was an excellent idea.

Taylor said PCOM should set a time table for resolution of the publication questions. This policy should be in the LRP document.

Moberly said that now is not the time to deal with this problem, there is not enough background information.

Pisias said that the publication problem is not in the LRP now.

Malfait said that something like this does not need to go into the Long-Range Planning Document, although it should be kept in mind that it has been identified as a problem by the outside community.

Shackleton wanted to know if consideration had been given to marketing aspects of the publications. People think of these volumes as being issued; more effort is needed to make them seem generally available for purchase by the public.

Kastner wanted the publication question put on the agenda for the spring PCOM meeting so that a firm decision can be made. She suggested that IHP prepare a report on the options based on their survey of Panel Chairmen.

Moore said that it would present difficulties to prepare the results of the survey at the March IHP meeting since not all panels will have met. Moberly said the problem was originally addressed to all panels. Pisias agreed that the general policy is a much broader issue that should go to panels for input to PCOM Moberly agreed, but suggested that it may not be possible by May.

Tuesday, 29 November 1988

Technology and Engineering Development Committee

C. Sparks gave the TEDCOM annual report. The committee has 15 members with 6 from the oil industry, 2 from Universities, 4 from research organizations, 2 consultants and 1 from industry. TEDCOM meets about every 8 months and sometimes combines their meetings with a workshop with other groups of affiliated interests.

TEDCOM disagrees with a term of reference for their panel: "TEDCOM is responsible for ensuring that the proper drilling tools and techniques are available to meet the objectives of ODP drilling targets". They feel that it is the responsibility of ODP-TAMU Engineering to develop new tools whereas their responsibility is an advisory capacity. Moberly asked TEDCOM to submit the wording they want to PCOM for forwarding to EXCOM.

Engineering priorities discussed in December 1987 TEDCOM meeting were:(1) Drilling and core recovery in hard and soft interbedded sequences; (2) Drilling and core recovery in young basement and fractured

rocks; (3) Drilling and core recovery in unconsolidated turbidites; (4) Drilling and logging in high temperatures.

TEDCOM is in agreement with TAMU that the mining, or Diamond Coring System (DCS) holds hope for drilling in interbedded sediments and basalts. Vibracoring and hydraulic hammers are being explored with the KTB Drilling Group for the purposes of drilling and recovering unconsolidated sandy sediments. Based on the results of the Riser Drilling Workshop, TEDCOM still thinks that a mini-riser system can be developed for the Resolution.

Long Term Goals to be addressed by TEDCOM as discussed at the February 1988 meeting are: (1) Deeper drilling - a 3 km hole by year 2000; (2) Higher Hole Stability using smaller holes such as in industry; (3) Mining drilling - How best to do it? Which motor to use - Circulation fluid drive, turbine drive (can get stuck without knowing it), or top drive system (recommended drive, will be tried on Engineering Leg)?

TEDCOM played a role in the contact between TAMU Engineering and the Norwegians who operate a drill ship which uses a diamond coring system to drill in water as deep as 1000 m. This system has been examined for application to that system under development for the Resolution. Close to 100% core recovery has been achieved by the Norwegians.

Communications between the Engineers and different panels have improved by the use of liaisons, but TEDCOM wonders if these are sufficient. There are problems with the expectations of thematic panels concerning engineering developments, where everyone wants engineering solutions by a specific date, but it is not always possible to solve problems on a set schedule. Better communications are needed with the scientists. Liaisons with thematic panels, engineers and other service panels are needed.

Discussion

Moberly said there is a problem with the cost both in money and time for liaisons to attend all of these meetings. Liaisons will be discussed on Friday. There is also the problem of setting clear priorities as every panel becomes involved. PCOM should make the decisions about where to direct efforts.

Garrison asked if the concern over recovery of reefal limestones can be lumped with the chert-chalk recovery problem. Harding said that the results of the Enewetak drilling are being studied to help solve the problem of recovery of interbedded reef limestones. Mayer noted that the DCS has been used successfully to core this material.

Mountain wanted to know if rubber-sleeve technology can be used for reefal limestone recovery. Harding said this was an old technology that has had success recovering sands. It was looked at previously, but is not compatible with the ship's technology and is not wireline retrievable. Moberly noted that this technique had over 95% recovery through rubble at Midway, but was very time consuming.

von Rad said that on Leg 122, which drilled several hundred meters of shallow water reefal and lagoonal limestones, recovery was only 2-10%. With present technology recovery of shallow water unconsolidated carbonates is a problem.

Moberly wanted to know what was the definition of a mini-riser. A slim-line riser drills through the existing drill pipe, but a mini-riser is a 5-6 inch riser compatible with the mining drilling system. Harding said that by packing off at the bottom of the drilling system on the Resolution it's possible that a riser could be made for the DCS.

751 Panel Chairmen Meeting

R. Detrick gave the report on the 4th Annual Meeting of the panel chairmen held on Sunday, 27 November 1988 (Appendix K). The following topics were emphasized.

New Panel Advisory Structure

Communication among thematic panels are more important in new panel structure and because of the long-range planning mode. Timely distribution of minutes is essential. It is recommended that formal, double liaisons be made among thematic panels. (LITHP to TECP & SGPP; OHP to SGPP; TECP to SGPP & LITHP; SGPP to LITHP, TECP & OHP).

Detailed Planning Groups are intended to: have a short life; advise appropriate thematic panels; have flexibility; provide regional expertise (WPAC, CEPAC); integrate existing proposals; provide technical or thematic expertise not available on thematic panels.

The Panel Chairmen unanimously adopted the following carefully worded resolution:

"The Panel Chairmen agreed that the planning of the ODP, and therefore the movement of the JOIDES Resolution, should be driven by the science that is proposed. Every effort should be made to drill the sites that address the most important scientific problems in the most appropriate locations, without regard to parochial or political considerations that impose an arbitrary time frame or push to have the ship visit a particular area."

The Panel Chairmen wanted to make it clear to PCOM that the proper amount of time needs to be taken to address scientific problems without arbitrary time limits being set.

Engineering development needs and priorities identified by the Panel Chairmen were: improved core recovery, drilling chalk-chert sequences, drilling unconsolidated sediments, drilling fractured rocks, drilling deep holes, drilling at high temperatures. A lot of the high-priority drilling requires the development of new technology. Therefore it is essential that the science plan be realistic in terms of the available technology.

Publication Policy was discussed extensively both at the Panel Chairmen meeting and in the PCOM meeting. IHP will circulate a questionnaire.

The Long-Range Planning Document was discussed for about one-half the meeting. It was suggested that the 16 thematic objectives in the Long-Range Plan be focussed under four broad themes:

Structure and composition of oceanic crust and mantle.
- Nature of lower oceanic crust and Moho
- Magmatic processes associated with crustal accretion
- Mantle structure and geochemical variability
- Intraplate- and arc-volcanism

Causes and effects of oceanic climate and variability.
- High-frequency global change
- History of sea level
- Longer-period global change
- Carbon cycle and paleoproductivity
- Evolutionary biology

Fluids in the lithosphere.
- Hydrothermal processes in the oceanic crust and sediments
- Mechanisms of dewatering of accretionary prisms
- Processes of fluid flow at passive margins
- Source of fluids
- Impact on global geochemical budgets

Dynamics, kinematic, and deformation of the lithosphere.

- Dynamics of oceanic crust and upper mantle
- Plate kinematics
- Deformation at divergent margins
- Deformation at convergent margins
- Intraplate deformation

This structure is similar to the COSOD II structure and gives a focus for long term planning.

Discussion

Kastner wanted to know what kind of technical expertise would be concentrated in a DPG. Detrick said as an example, if ODP wanted to establish a Seafloor Seismic Observatory, expertise on the best way to proceed could be provided by a DPG without having to establish a long term panel or working group. The EPR working group brought together expertise from different panels and individuals. A general discussion about DPGs established that they should be controlled by PCOM, limited in number, limited in life span, and have specific guidelines.

von Rad wanted to know why two-way liaisons were suggested instead of one-way with the liaison reporting to both panels. Detrick said this was what the panel chairmen thought would best improve communications while retaining panel advocacy.

PCOM generally agreed that the division along four major themes for the Long-Range Planning Document had merit. It was noted that these four themes do not correspond exactly to the thematic panels.

752 Thematic Panels

Tectonics Panel

I. Dalziel reported that in 1988 TECP spent most of its time working on the Long-Range Plan. TECP is now working on its second draft and expects to have the final revision done in February 1989. TECP concerns fall largely under the fourth heading of the main themes of the Long-Range Plan already discussed, namely dynamics, kinematics, and deformation of the lithosphere; although TECP also has interests in the other three divisions.

The TECP plan will try to generate a broader community interest in ODP programs, by addressing how the drill can be used to get at the underlying global tectonic processes. It will focus on models to be tested.

TECP high-priority programs (but as yet unranked) in the upcoming Pacific drilling:

WPAC Nankai as a natural laboratory for mechanisms and development of accretionary prisms. Must be able to measure fluid flow to justify drilling.

CEPAC Kinematic analysis

- Calibration of Mesozoic Anomalies
- Chile Rise Triple Junction (important for orogenic studies on-land)
- Hawaiian Lithosphere Flexure
- Cascadia Accretionary Prism (must be able to measure fluid flow)
- N. Pacific & Bering Sea (important for understanding global tectonic framework)

Dynamics

- Stress orientation
- Ocean Bottom Seismometers

Stress orientation and magnitude observations are important for (1) testing models of the driving motions of plate tectonics and (2) forces operating on the upper plate at convergent margins. Mapping of stress may be a secondary objective.

The Pacific is a better laboratory than the Atlantic to address many thematic problems, although, for example, drilling in the Mediterranean (Gulf of Valencia) or Southern Ocean (Bransfield Strait) fit into a thematically driven program. [Total high priority TECP months in CEPAC area cannot be determined at this time.]

Discussion

Cowan wanted to know what TECP sees as the new thematic goals in the long-range drilling plan. Dalziel listed logging fluid flow, permeability and pressures, and drilling deeper goals (2.5 km for Vancouver margin).

Leinen asked if the Chile Rise Triple Junction was another regional drilling theme or did TECP consider it a thematic problem best addressed at that location. Dalziel said the orogenic consequences of the subduction of a ridge are seen throughout geological history, therefore from a thematic viewpoint this is a high-priority site where ridge subduction can be studied in all of its different phases (before, during, and after). For proper integration, Dalziel suggested that two legs be devoted to a drilling program at the Chile Rise Triple Junction.

Sediments and Ocean History Panel

L. Mayer gave the final SOHP annual report. Because the mandate of this panel was too broad for the panel to cover the thematic field adequately, it is replaced by two new panels: Ocean History Panel (OHP) and Sedimentary Geochemical Processes Panel (SGPP). Copies of the first draft of the "SOHP Long Term Planning Document" and the second draft of the "JOIDES Sediments and Ocean History Panel White Paper" were distributed.

From SOHP's viewpoint, the minimum high-priority CEPAC drilling program is the following: (1) Eastern Equatorial Pacific Depth Transect; (2) Western Equatorial Pacific Depth Transect (*i.e.* Ontong Java Plateau); (3) North Pacific Transect; (4) Atolls and Guyots; (5) Shatsky Rise. [High-priority CEPAC drilling totals about 11 mo.]

Without improvement of core recoveries to at least 50%, SOHP has difficulty justifying either (4) or (5). SOHP suggests that the upcoming Engineering Leg be devoted to improving core recovery by drilling on the Shatsky Rise. The Ontong Java Plateau needs at least one deeper site into basement, which an upcoming cruise will survey. The Bering Sea has a high thematic priority for SOHP but is also a high risk program. SOHP requests that a DPG be formed to prepare a program for the North Pacific Transect and Bering Sea.

The new OHP has as its thematic objectives the study of: high-frequency global change, history of sealevel, low-frequency global change, carbon cycle and paleoproductivity. OHP plans for implementation of Phase 1 (1989-1992) drilling include: short-term engineering development of improved XCB and improved recovery in alternating lithologies, shallow-water carbonates, and gassy sediments; improved correlations between logging and recovered core; complete low-latitude and subarctic high-resolution transects; begin sealevel program with drillable carbonate margins, atolls and guyots; drill attainable low frequency targets. OHP plans for implementation of Phase 2 (1993-1996) drilling include: begin development of technology for drilling stable 2-3 km holes; complete surveys and selection of Arctic and deep passive-margin sites; initiate Central Arctic drilling using an alternate platform designed for Arctic drilling; mid-latitude high-resolution transects; continued sealevel studies using an alternate platform designed for drilling in atoll lagoons; extended Antarctic paleoceanographic and paleoclimatic record. OHP plans for implementation of Phase 3 (1997-2000) drilling include: one deep 3 km hole per year; continued Arctic drilling using an alternate platform designed for Arctic drilling.

The new SGPP has as its thematic objectives the study of: sedimentary geochemical processes (fluid flow and diagenesis) and facies evolution and depositional environments. Drilling strategy for facies evolution and depositional environment studies varies with objectives: stratigraphic and basin-evolution objectives require continental margin transects, facies studies will require small, dense arrays of sites to yield 3-D character of facies. Drilling strategy for sedimentary geochemical processes objectives requires transects of active and passive margins representing end-members of systems. Geophysical and geotechnical data are essential to develop 3-D picture of fluid flow. SGPP plans for implementation of Phase 1 (1989-1992) drilling include: improved recovery in sandy sediments; develop *in situ* tool technology; develop long term borehole monitors; studies of accretionary prisms and mud volcanoes; sedimented ridge crest and flanks; diagenetic studies in backarc basins, anoxic basins, and carbonate platforms; studies of turbidite facies. SGPP plans for implementation of Phase 2 (1993-1996) drilling include: begin instrumentation of accretionary prisms; develop technology for 2500-3000 m deep, stable holes and high-temperature drilling for sedimented ridges and flanks; transect studies of long-distance flow; high-temperature drilling on rift and flanks; diagenetic studies; drift, fan and ice-margin studies. SGPP plans for implementation of Phase 3 (1997-2000) drilling include: develop second generation instrumentation; develop deep instrumented multipurpose holes; study mass balance of subducting and passive margins; deep-drilling into hot areas.

Discussion

Moore and Tucholke both asked questions about the linkages between OHP and SGPP in relationship to thematic concerns about sealevel change. There also would appear to be duplication of efforts by the two panels. Mayer said that the SOHP white paper addresses these questions.

There was also a discussion about the use of alternate platforms to drill shallow continental shelves and shallow carbonate platforms.

Lithosphere Panel

R. Detrick gave the LITHP annual report. Accomplishments for the year included production of three reports: EPR Working Group Report, Sedimented Ridge Working Group Report, and LITHP Long-Range Planning Document. Other important issues were: WPAC planning for Geochemical Reference Sites and Lau Basin; CEPAC planning; and Engineering development.

WPAC

The Geochemical Reference Holes have a high thematic ranking from LITHP and have as their objective, obtaining first-order information on the composition of the principal components being subducted at the Bonin and Mariana Arcs. A viable reference-hole program requires sampling of the three major components being subducted: (1) a normal, marine pelagic sequence; (2) normal oceanic crust; (3) ocean-island lavas and volcanogenic sediments. The hypotheses that are being tested are: (1) That the more enriched compositions of the Mariana lavas compared to those in the Bonins are due to abundant volcanogenic sediments entering the Mariana Trench; (2) That alteration products in the upper few hundred meters of the pillow section can provide K, Rb, Ba and other LIL elements to arc-magma sources. LITHP suggested drilling program requires about 1.5 legs to drill the following sites:

BON-8 - Normal marine pelagic sequence plus 200 m or more of old, altered basement produced at a fast spreading ridge (M-13, adjacent to Bonin transect).

MAR-4 - Normal marine pelagic section and possible apron component (M-25, adjacent to Mariana transect).

MAR-5 - Volcanoclastic sediments adjacent to Hemler seamount at eastern end of Dutton Ridge.

Optional Site: MAR-6 - Sediments and uppermost basement at summit of Hemler seamount north of MAR-4.

LITHP suggests that: (1) MAR-5 be drilled as part of the Old Pacific program; (2) BON-8 and MAR-4 be drilled as one leg. The Geochemical Reference Hole leg does not stand alone, but is part of the overall 4 legs drilled in the arc and backarc drilling program supported by LITHP, TECP and WPAC. Can one leg answer the questions? Little is known about the composition of either the sediments or Mesozoic crust. One leg provides a quantum leap in our knowledge of unknowns for modelling fluxes at subduction zones. This is part of a proposed long term global program to quantify processes at both ridges and subduction zones.

The magmatic evolution and early rifting history of the Lau Basin has the highest LITHP thematic priority. Sites LG-2 and LG-7 are the highest priority followed by LG-3 and LG-6. LITHP still considers Valu Fa (LG-4) to be an immature drilling target and favors a re-entry hole on young crust (but not a bare-rock site) in the central Lau Basin (LG-1). LITHP recommended a Lau Basin Working Group meeting to reconsider proposed sites (LG-1) in light of new Sea Beam and Gloria data.

CEPAC

From the CEPAC prospectus LITHP has recommended a 7-leg program that includes two engineering half legs. In order of decreasing priority these are: (1) Structure of lower crust at 504B; (2) Magmatic and hydrothermal processes at sediment-free ridge crests (EPR); (3) Magmatic and hydrothermal processes at sedimented ridge crests (Middle Valley); (4) Early evolution of hotspot volcanoes (Loihi).

For Hole 504B LITHP favors deviating the present hole as the best option for sampling the boundary between layers 2 and 3, and the uppermost rocks of layer 3. An engineering half-leg should be devoted to this hole as early as possible in the CEPAC program. If 504B cannot be deepened, LITHP recommends other deep crustal drilling sites be evaluated.

The goal of EPR bare-rock drilling is to understand magmatic and hydrothermal processes at a fast spreading ridge and has a long-standing priority with LITHP. The EPR Working Group report has helped define strategy, site-selection criteria and science objectives. In LITHP's priorities, hydrothermal processes take precedence over magmatic processes. A suite of 8 holes is proposed with this priority: (1) a deep hole (1-1.5 km) near the ridge axis to penetrate as closely as possible to the top of an axial magma chamber; (2) a 500-m-deep hole to penetrate the upper crust near an active discharge zone; (3) a suite of three holes (about 300-m-deep) across the ridge out to 300Kyr crust; (4) a suite of three holes along the ridge axis from the middle to the end of a ridge segment. The highest priority objectives are also the technologically most difficult and require development of the DCS or other capability to drill young fractured rocks. A future program that LITHP would like to see developed is a series of 8 holes along a ridge crest to study the magmatic history.

The goal of the Sedimented Ridge drilling program is to: (1) Characterize in 3-D the fluid flow and geochemical fluxes within a sediment-dominated hydrothermal system; and (2) Investigate the processes involved in the formation of sediment-hosted sulfide deposits. This program would be easier to drill using existing technologies than the EPR bare-rock program. Two legs are proposed: (1) A hydrology experiment in Middle Valley consisting of a suite of six holes; and (2) Drilling of actively forming sulfide deposits in Middle Valley and Escanaba Trough. The highest priority site would be a single re-entry hole through sediments into basement in the active discharge zone slightly off-axis. Other holes would be drilled farther off-axis in both discharge and recharge zones. Extensive logging and fluid sampling would be part of this program. A new report has been submitted for Escanaba Trough drilling emphasizing the coeval volcanic association of sulfides and basalts; an array of shallow holes through sediments and sulfide bodies is proposed.

The objective of the Loihi drilling is to investigate the juvenile stage of Hawaiian volcanism and the physical and chemical processes involved in mantle plumes and their interaction with the lithosphere. Two holes are proposed: (1) A 200-400 meter deep hole in the summit area; and (2) A 100-300 meter deep hole

on the northern flank of the volcano. There is also interest in developing this site for long-term geophysical monitoring and borehole experiments. [High-priority CEPAC drilling totals about 12 mo.]

Engineering Development

LITHP has identified the following engineering developments as necessary for meeting drilling objectives: improved penetration rates and hole stability when drilling young, fractured basalts; capability to drill routinely crustal holes to 2 km; high-temperature logging and borehole instrumentation; better borehole sampling techniques (rocks, fluids);wireline re-entry capabilities and methods for long-term borehole data recording and retrieval.

Drilling Objectives for the Next Decade

LITHP has identified the following drilling objectives for the next decade: (1) Drill three holes 2-3 km into the oceanic crust, extending one of these holes to Moho by the year 2000; (2) Drill arrays of shallow (~300 m) and intermediate (1-1.5 km) depth holes in several locations along the mid-ocean ridge and establish a seafloor "volcano observatory" by the year 2000; (3) Establish a global network of seafloor geophysical stations equipped with short and long-period broad-band seismometers; (4) Complete select "case studies" addressing magmatic and dynamic processes associated with intraplate volcanism, plate convergence, and mantle evolution and heterogeneity. LITHP plans for implementation of Phase 1 (1989-1992) drilling include: begin site survey work for candidate sites for ridge crest drilling, deep crustal drilling and seafloor seismic stations; complete 2 legs of drilling at 504B; carry out 4 legs of drilling at EPR and sedimented ridge crests in NE Pacific; complete 3 lithospheric "case study" legs on magmatism in back-arc basins (Lau Basin), geochemical fluxes at convergent margins (Bonin-Mariana arcs), and early evolution of hotspot volcanoes (Loihi). LITHP plans for implementation of Phase 2 (1993-1996) drilling include: complete three holes 2000-3000 m into the crust including one hole in a fracture zone; begin first phase of Mid-Atlantic Ridge drilling and complete second phase of EPR program; carry out two lithospheric "case studies" (e.g. drilling a near-axis seamount and an oceanic plateau); establish 5 seafloor seismic stations. LITHP plans for implementation of Phase 3 (1997-2000) drilling include: extend one crustal hole to Moho; complete second phase of MAR drilling and establish a seafloor volcano observatory (in conjunction with RIDGE) in a volcanically active part of the mid-ocean ridge system; carry out 2 lithospheric "case studies" (e.g. a regional geochemical mapping experiment and an *in situ* stress experiment along an accreting plate boundary); complete installation of a global network of 15-20 seafloor seismic stations.

Discussion

Moberly wanted to know if any of LITHP's thematic science interests were involved in drilling the Atolls and Guyots, Old Pacific or Ontong Java Plateau proposals. Detrick said Old Pacific is an important part of the over-all Geochemical Reference Holes program. Sampling old crust (Mesozoic) formed at fast spreading centers can only be accomplished by drilling. If the Ontong Java Plateau (or Atolls and Guyots) were to be drilled into basement, LITHP would have a thematic interest.

Shipley wanted to know why BON-8 was being drilled 200 meters into basement for the alteration profile but not MAR-4 which should be equally as important. Detrick said in the minimum program, the maximum information is obtained by drilling MAR-5 at the expense of the basement at MAR-4.

The value of the Geochemical Reference Holes for helping to understand geochemical fluxes in arc volcanism was debated. A major point raised was if the recovered sediments and crust would be sufficiently representative of what has been subducted to be an improvement over general estimates of averaged components sampled from other regions (*e.g.* Old Pacific). The necessity of drilling versus dredging the seamount apron was also questioned.

ODP-TAMU Engineering Projects

B. Harding gave the first part of the report for ODP-TAMU Engineering. Panel Chairmen wanting to receive the monthly engineering status reports should contact ODP-TAMU Engineering.

The prospectus for Engineering Leg 124E remains on target. The new and improved final version of XCB is being "fine tuned" after the Leg 121 test. The Navi-Drill is on line for testing using a new high-torque, lower RPM motor. The Phase I Pressure Core Sampler will be tested on this leg. The Diamond Coring System was given a quick test at Salt Lake City and was shipped to Manila last week. There will be a one day meeting in College Station among ODP-TAMU Engineering, SEDCO operations, Tonto Drilling and other parties to discuss plans, procedures, and deployment of the drilling rig on the Resolution. A new experiment has been added, using a rented bottom-imaging sonar devise attached to the TV frame to look for chert layers around Site ENG-3, and to see what happens when chert drilling is attempted. There continued to be some concern expressed about finding chert-chalk interlayers at this site.

A handout was distributed about the DCS (Appendix L). Tests by AMOCO using an identical Universal Drillers (Australia) top-drive system, drilled 6000 feet with 95% recovery in West Texas. A 2000 meter system is going to be deployed on the Resolution.

On Leg 122, a new system for recording drilling parameters was installed. This system will help with correlating lithologies and drilling speeds.

A study of past chert drilling by both the DSDP and ODP programs is underway. The study will look at variables such as thickness of chert layers, drill bits used, success of method, etc. to help with the drilling on the Engineering Leg.

Methods such as vibracoring and hydraulic hammers for recovering sands are being studied via information shared by KTB.

A study is just underway to look at previous atoll drilling and associated recovery problems.

Discussion

The question was asked why there had not been a land test of the DCS in chert-chalk interlayers. Harding said since there have been successful on-land mining drilling tests in similar interlayered materials by other programs and the cost for these tests is a problem (ODP would have to buy pumps), the decision was to deploy the DCS on the ship.

Langseth said that a shallow high-temperature test of the drilling system will probably require drilling at hydrothermal vents on an oceanic ridge where high sulfide contents and high flow velocities will be encountered. Harding said that ODP has studied the drilling components that are affected by high temperatures and does not think it will be a problem since the hole is cooled by circulation of the drilling fluids and takes several hours to rebound. The present buterate plastic core liners are rated to only 175-180°C and metal core liners will have to be used above approximately 200°C. Francis wanted to know what effect the H_2S-rich fluids will have on the drill string. Harding and Storms said H_2S causes embrittlement of high strength steel and ruins the joints. ODP can run down-graded pipe (20% wall-loss) but they can't pull on it. There were several questions whether or not high-temperature drilling could be done realistically, and the answer appears to be that it can be done. For water depths greater than 2500-3000 m steam-flash appears to be less of a problem than originally thought. The depth range for the shallow high-temperature drilling test will be in the 2500-3000 m range.

Detrick wanted to know what plans were being made to overcome the problem with initial hole instability in fractured rocks. Harding said that a smaller diameter hole drilled at higher speed and with a lighter bit weight should solve the problem. Detrick wanted to know how this would cure the problem of collapse of rubble into the hole. Harding said that starting the hole with the present drilling system and then drilling

through this larger pipe with the smaller DCS drill pipe (casing by drill pipe) should solve the problems of initial hole collapse. Detrick said that there are two drilling problems that must be solved: (1) Rubble; (2) Deep drilling. Harding said that the DCS needs to be tested to see if it can solve these two problems.

Pisias wanted to know the cost and time necessary to extend drilling capabilities to 4000 m and beyond using the DCS. Harding said that the DCS could be extended to about 4000 m within a year of Leg 124E given the resources (~$740K). Extension of drilling beyond this (Phase III 4000-5500 m) will require major redesign to both platform and mast as well as other parts of the drilling rig with the cost over $1M.

Development Engineering Schedules

M. Storms then discussed the three ODP Development Engineering Schedules: (1) Project Schedule; (2) Generic Technology Requirements; (3) 3rd Party Development Schedule (Appendix M). He said the vibra-percussion corer was still being studied through cooperation of the KTB Drilling Group but no money is available for ODP testing. An engineer working on the vibra-percussion corer system will be on the Engineering Leg. ODP hopes to be able to marry this system into the drilling program based on the experience gained through piggybacking with KTB.

ODP-Engineering would like PCOM input on a breakdown of the priorities for the technology development line items, so that the engineers can make plans based on the highest priority required developments.

Storms updated what ODP knows about third party tool developments. The status of the Barnes sampler is unknown. Geoprops (Taylor & Karig), Pressure Meter (K. Moran), and Japanese Instrument Emplacements 1 & 2 are on schedule. Keir Becker's TAM straddle packer design works with only minor changes needed. The ODP TAM drilling packer was developed and deployed early in program (Leg 110) but ODP-Engineering does not recommend using the drilling packer over the straddle packer. Because of a concern about hole collapse and deployment of the Geoprops tool, Leg 124E will test hole conditions after removal of the Navi-Drill but without deploying the Geoprops tool. There will also be a test of the straddle packer using a minicone.

Discussion

Francis wanted to know about the status of the Downhole Turbine-Thruster for the DCS since it was included as a line item on the development sheet with $100K budget. Storms said the money was requested for development participation with the KTB Group of the Downhole Turbine-Thruster, but the money was not available. The top-drive system works better and has been adopted for the DCS. Turbines are a problem in an oceanic environment.

Francis wanted to know if the Geoprops tool will be tested before the Nankai Leg (129). Brian Taylor has set aside 6 hours for a test of Geoprops on Leg 126.

von Rad wanted to know if the XCB had been improved since its use on Leg 122 where very poor quality cores were recovered. Storms said that both the flow to the cutting chute and the cutting chute itself have been modified and they expect that tests on 124E will show that they have gone as far as they can go with the advanced XCB design.

Langseth wanted to know if the problem of not knowing if the Navi-Drill core barrel advances has been solved. A system using MWD technology, being developed by industry, has been adapted to measure if the drill is advancing. Lancelot wanted to know if this system could be used with the APC system. Yes it could, but it would only be of minimal help.

Leinen wanted to know if the break-away piston head core was at a stage where only a few more weeks of work is needed to make it operational. The break-away piston head was designed, deployed and tested, but the piston head was breaking away at the wrong time. To correct the problem the hydraulic orifices need to be balanced and this will require an iterative adjustment and testing program.

Becker said the rotating head packer was successful on Leg 123 and could be very important as an alternative system at Nankai, since it can be used in holes that are unstable whereas his packer needs a stable hole.

Update on Third Party Tools

K. Moran gave a further update on several of the third party tools. Her own Lateral Stress Tool - Phase I makes passive, autonomous, low temperature, *in situ* measurements of lateral stress (magnitude and direction), pore pressures, and temperature in soft sediments (APC range up to 150 m), but disturbs the sediments. The Phase-I tool replaces the nose or shoe of the APC. This tool is now in the testing phase. Her Lateral Stress Tool - Phase II is an active tool which includes measurements of *in situ* deformation properties of harder sediments and will be used in conjunction with the Geoprops tool. This tool is in a three year design phase and a prototype should be tested on the Engineering leg after 129E.

The Geoprops tool being developed by Karig and Taylor using packer technology and has as its goals the *in situ* measurement of pore-water pressure, permeability, temperature and pore water sampling. This tool is in a "dynamic design" status that is "on track" for deployment at Nankai. Shipley said that the electronics are ready for fabrication and any physical problems are minor.

Western Pacific Regional Panel

B. Taylor gave the report for WPAC. He went over the summary (which starts on p.131 of the agenda book) of scheduled upcoming legs that are part of the WPAC Prospectus. He covered the suggested changes for Leg 125 (exchange BON-6A and BON-6B for BON-6; set re-entry cone at Site BON-6A) and Leg 126 (exchange BON-4 for BON-5 in list of drilling priority and run VSP and formation microscanner at BON-6A). Science objectives will not be changed from what PCOM approved for the FY89 program. PCOM therefore gave its approval to the changes for Leg 125 and 126 as suggested by the Co-Chief Scientists at the pre-cruise meeting and approved by PPSP and the ODP-TAMU Science Operator. There is a potential problem with Leg 127 because what has previously been interpreted as basement in the Japan Sea has low seismic velocities and shows layering. Drilling to the high-priority oceanic basement may take longer than previously anticipated. Therefore it is suggested that the highest-priority site J-1b be drilled to oceanic basement taking as long as necessary to reach this objective. The lowest priority site J-3b should be drilled on a time-available basis. WPAC suggests that DMP re-evaluate the electrical conductivity experiment proposed for site J-1b. Leg 128 remains unchanged. The time requested for logging on Leg 129 (31.3 days) is unacceptable for a one-leg program, so WPAC has recommended a two-leg program.

WPAC programs which are not yet scheduled were also covered by Taylor and are in the summary (p.131). WPAC suggests that the number of Geochemical Reference Leg sites be shortened to drilling the primary BON-8 & MAR-4 sites plus logging, with additional drilling in the volcanoclastic apron and seamount sites at MAR-5 & 6 done if time is available. NE Australia Margin should eliminate 2 sites to keep drilling times within a standard length leg. Vanuatu shows a "velocity pull-up" structure which may indicate fractured volcanic material above the décollement and could cause longer drilling times for the high-priority sites. All of the Lau-Tonga sites can probably be drilled in one leg.

Jim Gill is nominated to replace Taylor as WPAC chairman.

Discussion

Mountain asked if the single line of heat flow measurements along the seismic line for BON-1A was sufficient, but as the need for heat flow measurements was safety related and not part of a hydrogeology program, this survey was deemed sufficient. Langseth suggested that detailed heat flow measurements be made downhole.

Discussion of the oblique electrical resistivity experiment at site J-1b was continued on Wednesday (see end of Minute 754).

Wednesday, 30 November 1988

Central and Eastern Pacific Regional Panel

D. Rea gave the CEPAC report. Two concerns of CEPAC covered in letters in the agenda book are: (1) Lack of chert-chalk sequences at site ENG-3 (p.173); (2) Engineering development priorities (p.174); Leg 129E should address chert-chalk (Shatsky?), limestone (Menard Guyot?), and young crust (Mariana back-arc?).

Rea talked about the results of Leg 121 which suggest that APC cores have gaps that total about 10%, but that by vertically offsetting the cores 4.5 meters in an adjacent hole this loss of data can be avoided.

Rea discussed the 14 programs covered by the CEPAC Prospectus, emphasizing that only one site (504B) has a fixed location whereas all others require site-survey information to various extents. Programs where there are significant problems are: Flexure of the Lithosphere where dating of material to within 100,000 years is essential for testing the response of different flexure models; Cascadia Margin needs a more polished proposal for the Vancouver sites and more MCS for both sets of sites; Old Pacific where there is a need to determine paleolatitudes (for pre-70my plate-motions) and therefore oriented hardrock core samples; Atolls and Guyots require recovery of reef limestones, and alternating lithologies; Shatsky Rise Anoxic Events requires recovery of alternating lithologies, depth and dating of anoxic events; Lower Crust at 504B needs the hole cleaned or deviated; EPR Barerock Drilling and Loihi both need engineering developments to deal with high-temperatures and corrosive fluids plus drilling and recovery of fractured rocks; Sedimented Ridge Drilling also requires high-temperature drilling capabilities.

Total time required to drill the CEPAC programs would be over 20 legs without including transit times.

754 Drilling Plans for FY90

High-priority drilling in the Pacific should be done in the next few years, since under a thematically driven program open to drilling in all oceans, transit times may become very large if the ship has to shuttle frequently through the Panama Canal between Atlantic and Western Pacific Oceans.

A general discussion was held about whether Nankai should be drilled as a one leg or a two leg program. Leinen via Larson suggested that a second Nankai Leg should be drilled about a year after Nankai I to allow time for evaluation. Shipley indicated that a one-leg versus a two-leg program has a big effect on what science is planned. A one-leg program requires moving site NKT-2 up slope. A minimum program requires three holes to be drilled at sites NKT-1, NKT-2 and NKT-10 in order to determine gradients as suggested by the Fluid Processes in Accretionary Processes Working Group. Taira said that in a one-leg scenario NKT-10 in the proto-thrust zone of ductile deformation would not get drilled. A two-leg scenario allows time for both more holes and a more complete logging program, so that horizontal as well as vertical gradients and fluid flow can be measured. Francis noted that DMP requests 31 days of logging and calls for 54 deployments of the Geoprops tool, which he thought was exaggerated logging expectations for untested tools. It was generally agreed that the measurements made with these tools (especially packers) are the most important scientific aspect of this drilling program. Therefore DMP needs to prioritize both logging requirements and sites for this leg in order to reduce logging time to about 20 days. The WPAC scenario suggested for drilling the first Nankai Leg is:

NKT-1	drill 10.0 days + log 6.9 days		16.9 days
NKT-2	drill 21.1 days + log 16.0 days		37.1 days
Contingency + Transit			6.0 days
		total	60.0 days

Cowan wanted to know the options if the Geoprops tool is not ready for deployment on 19 October 1989. A discussion was held about options and it was decided that since Karig has indicated that the tool will be

ready and there are other tools and packers to be tried on the Nankai Leg, everything should proceed as planned. Nankai I is to be kept in the present schedule after the drydock in the NW Pacific.

PCOM Motion

Accept in the FY90 drilling program a Nankai Leg consisting of drilling sites NKT-1 and NKT-2 and about 20 days of logging. A second Nankai Leg will be considered after evaluation of the first Nankai Leg. (Motion Pisias, second Francis)

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

It was suggested that the proposed SW Pacific WPAC programs were more advanced than the North Pacific CEPAC programs and should be considered for drilling after Nankai. However cyclones in the southern areas such as off Australia during December through March prevent safe drilling of these programs soon after Nankai. It was therefore suggested that the second Engineering Leg be drilled at this time.

CEPAC, LITHP and SOHP have all identified development of new engineering capabilities as necessary for accomplishing thematic objectives. Testing of a longer DCS, Geoprops Probe, OBS Instrumentation Experiment, etc. were all suggested for a second Engineering Leg. Rea said CEPAC's recommendations for a second Engineering Leg are drilling and recovery of chert-chalk interlayers, reefal limestone rubble, and drilling young fractured rocks. The Shatsky Rise, Menard Guyot and Mariana Back-Arc were suggested as sites close to one another and suitable for these tests.

ODP-TAMU expressed some concern that Leg 129E was being planned before Leg 124E has been drilled. Moberly said that preliminary planning of the leg requires some knowledge of what needs to be tested. If engineering developments for drilling in young fractured rocks are not tested soon then the EPR bare rock drilling gets moved back even further. Tucholke said the important thing at this stage is to establish when to have the leg; what is to be done can be decided later. Larson pointed out that a half leg (30 days) is only enough time to do one test. von Rad suggested that a balance is needed between science drilling and technological development to enhance the scientific capabilities. Moberly asked PCOM to postpone the discussion of objectives for the engineering legs until FY90 scientific legs are set.

Moberly said that he sees a pull towards the SW Pacific because of the maturity of those proposals. Leinen via Larson recommended that Engineering Leg II be drilled between a Japan to Guam transit and that on the return transit northwards either the Geochemical Reference or Old Pacific proposals be drilled. Malpas said that it should be kept in mind that the drill ship should stay away from NE Australia until March when the cyclone season ends. This translates into at least 1.5 legs after Nankai.

Eldholm said that the science of the WPAC program needs to be reevaluated. Pisias pointed out that Lau-Tonga, Vanuatu and NE Australian Margin have been discussed in depth and are part of the WPAC program previously accepted by PCOM. Eldholm asked if Lau-Tonga had required some revisions. Langseth (PCOM watchdog) said that the drilling priorities and science objectives have not changed from what PCOM approved. All sites can be drilled in one leg.

PCOM Motion

Accept in the FY90 drilling program the NE Australia Margin, Vanuatu, and Lau-Tonga programs as most recently modified by WPAC (Motion Shipley, second Kastner)

Vote: for 15; against 0; abstain 1

Langseth asked if space should be reserved for programs such as Banda and South China Sea which had their science objectives approved but because of political problems did not get drilling approval. It was decided that until clearance is given they will not get scheduled, but TAMU is asked to continue seeking approval for these programs.

The Geochemical Reference Holes were discussed extensively, because of their previous low ranking by regional and all thematic panels. Malpas (PCOM liaison to LITHP) said that a letter from J. Natland discusses how this leg was originally proposed as a part of a large thematic program, which has been whittled down to what may appear to be a one leg regional proposal. The global thematic science which is being addressed by drilling in the Mariana-Bonin region is the crustal contributions to arc volcanism. The Mariana-Bonin system is one of the simplest and cleanest arc systems studied, where known geochemical variability of the volcanic arc products can be directly related to the different proportions of three crustal components being subducted (marine pelagic sediments, altered upper oceanic crust, seamount component in Marianas). This leg should not be viewed as a local one, but as part of the larger science objectives identified in the Long-Range Planning Document.

Kastner said the theme of geochemical reference holes is trying to address some basic science questions that are part of the objectives of ocean drilling. The two sites BON-8 and MAR-4 are important for understanding old altered ocean crust and require 100 m penetration into the crust to get the alteration sequence. Sites of second-order importance can be sampled in other ways, MAR-5 as part of the Old Pacific program and MAR-6 (seamount apron) by dredging. Lancelot said that he still thinks that the program is poorly designed. Taira said that this is not a single-shot program, but one designed to give a first handle on the problem. Cowan said that the first order differences between the Mariana and Bonin arc volcanism suggest differences in the crust being subducted; both BON-8 and MAR-4 need to be drilled. The geochemical and petrological differences between the two arcs are much greater than the variability along each arc axis. In answer to queries about the actual site locations, Taylor said that these sites were chosen because they had good site-survey data. Langseth said these would be good sites to use the borehole televiewer to determine stress magnitude as part of a regional stress map. In query to the question of drilling times, Taylor said that BON-8 (200 m basement penetration with set reentry cone) and MAR-4 (100 m basement penetration with free-fall cone) can be done in a standard length leg.

PCOM Motion

Accept within WPAC drilling program one Geochemical Reference Leg, including sites BON-8 and MAR-4, plus appropriate downhole experiments and logging. (Motion Kastner, second Taira)
Vote: for 12; against 2; abstain 2

A general discussion was held regarding thematic ranking of proposals versus execution based on geographical and logistical constraints. It is possible that drilling will not be back in the SW Pacific for some time following the WPAC program. After FY91 with drilling open to all oceans there will be an open competition between remaining CEPAC, WPAC and new proposals. PCOM must decide whether it is acceptable to spend large amounts of time for transits between the highest priority legs or to insert lower priority legs that fill geographic or time gaps. Only mature proposals are supposed to be considered for drilling.

Next the CEPAC programs were considered, to see if one could be inserted within the FY90 schedule. Moberly emphasized that thematic panel rankings should prioritize the CEPAC proposals and he will ask for any new rankings from the panel chairmen for the Spring PCOM Meeting. Francis was concerned that all panels rank proposals in the same way. It was also a concern that some panels would be ranking proposals in which they have no interest. Rea said that the CEPAC Prospectus is a distillation of over 100 proposals based on thematic panel rankings. It was noted that the top-ranked proposals of each of the thematic panels are listed in the prospectus in the order TECP, SOHP, LITHP. Of the western CEPAC proposals, PCOM agreed that the Ontong Java Plateau is the best at present in terms of site surveys and has a high priority with thematic panels.

PCOM Motion

Place an Ontong Java Plateau Leg within the FY90 program. (Motion Malpas, second Pisias)
Vote: for 15; against 0; abstain 1

Taylor suggested that PCOM examine the proposed WPAC drilling schedule on page 143 of the agenda book. It was generally agreed that the proposed schedule fulfilled the plans already suggested for drilling in FY90.

PCOM Motion

Following a Nankai Leg the general order of drilling in FY90 will follow the order on page 143 of the agenda book with the CEPAC Leg identified as the Ontong Java Plateau. (Motion Malpas, second Francis)

Vote: for 14; against 0; abstain 2

Note: this then is the approximate cruise plan for FY90

129	10/19-12/18 1989	2 mo.	Nankai
129E	12/23-1/21 1990	1 mo.	Engineering II
130	Feb.-Mar. 1990	2 mo.	Geochemical Reference
131	Apr.-May 1990	2 mo.	Ontong Java Plateau
132	June-July 1990	2 mo.	NE Australia Margin
133	Aug.-Sep. 1990	2 mo.	Vanuatu
134	Oct.-Nov. 1990	2 mo.	Lau-Tonga

Some concern was expressed that EPR Bare Rock Drilling was not in the FY90 plan. If this leg is to be drilled before FY92 then an engineering leg must be planned to prepare the site. The technological issues will also have to be resolved. Another concern was that place savers may need to be placed for the second legs of some drilling programs (*e.g.* Nankai II). There is however the danger that this might make it seem these second legs are guaranteed, whereas their drilling must be based on results of the first leg.

Engineering Legs

The earlier discussion of Engineering Legs was continued. Engineering developments identified by PCOM and panels to have high priority for CEPAC and later programs are: drilling at high temperatures; drilling and recovery of young fractured crust; drilling and recovery of chert-chalk sequences; drilling and recovery of unconsolidated sediment (shallow-water carbonates; sands) and reefal limestones rubble; further testing of the diamond coring system aimed at the preceding; and testing of downhole instrumentation.

von Rad said that drilling and recovery of chert-chalk sequences has the highest immediate priority and the DCS should be used to solve the problem on the second engineering leg. He suggested the third engineering leg be devoted to solving problems of hot temperatures and fractured rocks. Pisias thought that high temperatures should be given the highest priority since this problem must be solved for the EPR drilling; high-temperature drilling could be tested either in sediments or bare rock. Langseth noted that a deep hole in the offaxis recharge zone of a hydrothermal system would not encounter high temperatures in the upper 1 km and could be accomplished without new engineering developments. An engineering leg could both set guidebases and do a drilling test in the high temperature zone. von Rad wanted to know if drilling hot conditions could be tested on land (Kilauea). Harding said that testing on land would not be the same as ocean drilling. Testing of some components would be possible, but there would be problems testing the heat exchangers.

Pisias emphasized that if deepening of 504B is to be accomplished before the end of the present program then an engineering leg devoted to hole preparation must be soon (early FY91). Kastner said that the

highest priority should be testing of the DCS in hot rocks and fractured rocks to prepare for the EPR drilling. Garrison pointed out that transit times from the Western Pacific (Pago Pago) to the EPR and back would total about one month (or half a leg). Taylor suggested that the well-surveyed Bonin Rift (1700-2400 m depth) has both bare rock and sediments as well as hydrothermal vents and thus is suitable for a Western Pacific engineering leg. A deeper water test could be in the Mariana Trough (3500-4000 m depth) where Alvin observers located hydrothermal vents. Moberly suggested that a test of the DCS for drilling and recovering of chert-chalk sequences could also be done at Shatsky Rise, which is 2-3 days transit from the Bonins. Harding noted that vertical racking of drill pipe with the Diamond Coring System makes a substantial savings of time for tripping the pipe. The possibility was suggested that another drill ship could be hired to clean or deviate the hole at 504B on a "no cure-no pay" basis, but it was pointed out that the cost of hiring this out is not in the budget.

PCOM Consensus

The Second Engineering Leg (129E) should be a further test of the mining coring system with emphasis on drilling and recovery of fractured crust and chert-chalk sequences, with reefal limestones-sandy sediments added if there is time.

PCOM Consensus

The Third Engineering Leg (134E) should be aimed at meeting the science objectives in the Eastern Equatorial Pacific by preparing for drilling at 504B (clean or deviate hole) and EPR Bare Rock Drilling (set hardrock guidebases). It was noted that this leg, with a long transit, may require 60 days, which would be in about December 1990 and January 1991.

Other Drilling-Related Matters

Pisias asked that two items be addressed: (1) prioritization of the downhole measurements in the Japan Sea; and (2) what to do with the $68K SOE contingency funds. Pyle said that the SOE amount is so small it could easily be used up by the DCS. Purchase of the Digital Borehole Televiewers remains PCOM's intention for SOE funds. Since there was so little money and the costs associated with the DCS are only gross estimates, that may not be possible now.

A general discussion was held on the problem of downhole measurements proposed for site J-1b in the Japan Sea. Both an oblique seismic experiment (6.6 days) and an oblique electric resistivity experiment (2.6 days) were proposed for this hole. The oblique electric resistivity experiment did not get support from TECP although DMP had included it in the program in its 1987 minutes. The logistics of both experiments include the use of a second ship and has required considerable coordination, elimination of the resistivity experiment would be a disservice to Japan. DMP will be asked to review again the proposed oblique electric resistivity experiments at site J-1b. A written review of the experiment will be requested as soon as possible of Nigel Edwards by John Malpas who will then forward this report to Mark Langseth. Within a day of the DMP panel meeting a decision on whether or not to proceed with this experiment will be made by Ralph Moberly and Mark Langseth, with the consultation of Keir Becker, and transmitted to Lou Garrison for any appropriate scheduling changes.

755 New Drilling Vessel

Y. Lancelot presented information on the new French initiative to build a European drilling vessel. The scientific objectives, proposed technical approach, and data about the ship are given in the attached handout (Appendix N). The new ship is envisioned as being integrated into ODP with scientific advise by JOIDES, with either a full-time or part-time operation schedule. France is willing to stay in ODP and also participate in this project. The other European partners will be asked about their participation in this project. France would assume 30% of the cost. Management of the ship would be in Europe. Proposals for drilling would come from worldwide.

Thursday, 1 December 1988

Discussion

Malfait asked why there was only 200 days of ship use indicated. Lancelot said it was 200 days for drilling in a year; the rest of the time would be used for other projects. Malfait asked if the Charcot was being replaced with another new ship. Lancelot said a 85-m-long ship was being built that was equipped with a hanger for the Nautile. The new ship will be operational in about a year and a half. It will be equipped with a new Seabeam system that has a 60-beam system.

von Rad commented that the European technological community favors building a big ship, but the European science community questions if enough manpower and funding is available for operating two drilling ships. Competing projects are already imperiling drilling funds in the FRG and the major decision about continuing ODP funding will coincide with money requests for this new project. Lancelot said he did not think manpower would be a problem, since there is a large geological community in France, Germany, Italy, and Britain which can be brought into the new project.

Francis said that NERC is concerned with building new UK research ships including a new Antarctic research vessel the James Clark Ross which is expensive (£40M). The Discovery also needs to be replaced, but a £10M refit will try to stretch the life. Lancelot said that France has modified an ice-breaking vessel which will be run by TAAF rather than IFREMER. In a few years there will be 4 icebreakers operating out of Europe.

756 Reviews of Drilling Legs

Leg 120

R. Schlich reviewed Indian Ocean Leg 120 on the Kerguelen Plateau. Leg 120 lasted from 21 February until 30 April, 1988 (69 days), with a total of 28 days spent on drilling operations. Reports have been published in both Geotimes and Nature. Leg 120 drilled 12 holes at 5 sites on the Kerguelen Plateau under hostile drilling conditions: waves >20 m, winds >65 kts, and 20° rolls of the ship. Recovery was only about 20% due to the unfavorable conditions. The objective of drilling was to recover Neogene, Paleogene-Mesozoic, and basement sections. Drilling results for Leg 120 sites 747 ,748 , 749, 750, 751 were presented. Site summaries and preliminary interpretations can be found in the Leg 120 Preliminary Report.

Discussion

The problem that logging took a much longer time than expected was discussed. Weather conditions and tool failures both played roles in the long logging times.

Leg 122

U. von Rad and B. Haq reviewed Indian Ocean Leg 122 on the Exmouth and Wombat Plateaus. von Rad thanked PCOM for allowing flexibility in moving drilling sites so that the best science could be accomplished. The basement of the Exmouth and Wombat Plateaus is foundered continental crust. Sites occupied on Leg 120 were 759, 760, 761, 764 on the Wombat Plateau, and 762 and 763 on the Exmouth Plateau. Drilling results for Leg 122 can be found in the accompanying handout (Appendix O).

Discussion

The site pre-review process was discussed. Much concern was expressed over the potentially dangerous conditions that were encountered during drilling on the Exmouth Plateau (Site 763) when a gas-rich sand was drilled. Site pre-review should have spotted this problem since it was previously noted by oil industry drilling at this location. PPSP will be asked to perform a post-mortem on the Leg 122 information.

Leg 123

L. Garrison provided a review of Leg 123 drilling in the Argo Abyssal Plain. Site 765, where there are suppressed M26 magnetic anomaly signatures, has drilled 931 m of sediments and 271 m of basalt. A brown, silty, hemipelagic claystone was found at the sediment contact with the underlying fresh glassy basalts which appear to be typical MORB. Recovery has been about 68% in the sediments and about 100% in the basement. VSP experiment did not have much success because of attenuation of signal and noise in the pipe. Single packer experiment was partially successful and found low permeability. Double packer failed due to packer mechanism mistake. The hole was cased to 31 m into the basement. Site 766 was rotary cored to 767 mbsf. Basement was encountered at 466 mbsf where a series of diabase intrusive sheets (40-50 m thick) of MORB affinity were found. Recovery was about 66% in sediments and reached 100% in basement. Three series of logs were run but ledging problems curtailed additional logging.

Leg 124

Garrison then described Leg 124 drilling in progress. The Celebes Sea hole (CS-1) was lost at the basement contact, when the pipe got stuck in turbidites and had to be severed (see also Minute 747 above). A medical evacuation caused some delay in the Sulu Sea (SS-2) drilling. Celebes-1 will be redrilled into basement if there is time.

Discussion

A discussion was held about the problem of medical evacuations and whether this is the result of more people on the ship or inadequate checking of health before going to sea. There is a problem with some of the subcontractors not requiring adequate reports on physical condition, but the illnesses which required medical evacuations probably could not have been detected beforehand. Medical staffing and facilities onboard the Resolution are in good shape.

757 Long-Range Planning Document

A discussion of the Long-Range Planning Document was led by its author, N. Pisias. The document will be used as part of the proposal to renew ODP, for NSF and the non-US drilling partners. He identified successful completion of the Nankai, EPR, and 504B Legs as being important for the future of the program, in order to demonstrate that ODP can plan and execute high ranking scientific programs that are technologically difficult. ODP is a long-range project; the thematic objectives of high-priority already have more than 100 proposals, which translates into over 17 years of drilling. A 50% increase in funding is not to be expected. An alternate drilling platform or another ship, while attractive, is not a reasonable expenditure, because as yet the long-range planning documents from the panels show little need for one. He also wanted it kept in mind that other global initiatives are starting to gather momentum and they will be competing with ODP for funding. The ODP approach is to deal with the earth as an interlinked global system, which can be divided into four main topics. Pisias expects panel chairmen will help to integrate their white papers and provide cross-reference to other documents (e.g. COSOD I & II) in the Long-Range Planning Document.

Discussion

There were some general questions about the funding of the present program. The Ocean Drilling Program has National Science Board approval through FY92 to spend money. The Memorandum of Understanding with each partner extends through FY93, so there will be drilling in 1993.

Questions were raised about when the final document would be ready and its distribution. The "final" document would be brought to the Spring PCOM meeting for last minute work and final approval. This is only three weeks before the EXCOM and ODP Council meetings. The document will be reproduced by JOI

to be sent out to all interested scientists and international partners. Distribution will be sought as widely as possible. COSOD I & II documents will also be distributed to interested parties.

It was felt that the scientific aspects of downhole measurements were under-represented in the document. A charge was given to the DMP to prepare a section on scientific highlights of the logging program. Malpas said that Canada would be interested in the results that have come out of the program that are of value to industry. He was asked to prepare something on the technological developments and applications. Eldholm also thought that the technological achievements should be highlighted, especially the development of deep-water drilling technology and developments in downhole measurements which will help promote the program outside the academic community. Sparks volunteered TEDCOM to help with the section on technological developments.

Taira said that highlights of the Japanese scientists' contributions to ODP would be useful in Japan; this could be a one page summary of Japanese scientists' publications. von Rad said documenting the contributions of international partners is important for promoting the program.

It was thought that the Global Geosphere-Biosphere links were too vague; specific statements are needed about how ODP results can be used to study such topics as pollution, world-wide oceanic and atmospheric circulation, and environmental and climate change, with references to specific documents.

An executive summary is needed for the COSOD documents. Keep everything as clear and crisp as possible, with 2 or 3-sentence bullets used in the introduction to highlight exciting achievements.

Francis wanted to know if the budget was going to be based on steady-state funding. If so, do parts of the program have to be cut out? Pisias said that the emphasis was now on the proposed science objectives. The budget will be worked out after the ODP-TAMU and ODP-LDGO cost analyses are completed, which will be before the next PCOM.

Kastner suggested that PCOM show its appreciation of the work of the subcommittee and especially N. Pisias (and staff) in putting together the Long-Range Planning Document. A round of applause signified appreciation.

758 Four Year Planning Mode

PCOM cannot jump directly from its present thematic-priority regional-planning mode to a four-year thematic-priority all-ocean planning mode, as there are not enough mature proposals to jump into a three-year mode. The main item for the Spring 1989 PCOM meeting in Oslo will be planning the ship's general direction in a three-year mode (Spring 1989 to Spring 1992). By the following year (Spring 1990), panel reviews of new and existing proposals should allow PCOM to plan the general route for four years (Spring 1990 to Spring 1994).

Pisias said that the present challenge is to take the prospectus with nearly mature proposals and plan three years. This means that the thematic panels' rankings of thematic priorities of proposals become all-important for planning. New proposals will have to be integrated into the thematic rankings constantly. Eldholm said that he agrees that it will be hard to go directly to the new mode, but PCOM also has to open the program to all oceans after 1991. There may have to be some compromises at the Oslo meeting if there are no mature proposals for drilling in all oceans, but PCOM must show it is open to this new drilling. Malpas suggested that a "straw man" type setup be made at the Oslo meeting. As new proposals come in it may fall apart, but a schedule can be designed so the engineers will know when developments will be needed. Moberly pointed out that the existing PCOM commitment to 18 months of CEPAC drilling would carry through all but the last few months of the 3-year general planning at Oslo. Pisias suggested that the CEPAC prospectus plus any new proposals should be used for the ship track.

Cowan asked if DPGs are needed to evaluate objectives. The need for DPGs was discussed. DPGs serve useful purposes such as: integrating the priorities of the thematic panels; insuring full evaluation of proposals; work on specific requirements of an individual hole; help improve program development; provide an overall flexibility; and assemble special expertise. That was the general basis for the following decisions.

PCOM Motion

(1) Retain the CEPAC panel membership as a Detailed Planning Group that reports to all thematic panels and (2) evaluate the CEPAC membership to determine if any other new Detailed Planning Groups are needed to provide advice in the CEPAC-area. (Motion Kastner, second Taira)

Vote: for 11; against 1; abstain 3 (absent 1)

During the discussion, Larson stated that slight addition or modification in the present CEPAC membership should allow it to provide detailed planning without creating new DPGs. [Present members of CEPAC are: Rea (Mich.); Beirsdorf (FRG); Davis (Can.); Flower (Ill.); Floyd (UK); Francheteau (France) Kroenke (HIG); Okada (Japan); Sancetta (LDGO); Schlanger (NW); Schrader (ESF); Sliter (USGS).] Another suggestion was that any new DPGs should report to PCOM before the May meeting.

Langseth advised PCOM that only accepted proposals or highly ranked thematic programs be the basis for DPGs. The purpose of a DPG is not to write proposals. PCOM should not create a Bering Sea DPG. Cowan said that the Bering Sea has excellent proposals and two panels have called for creation of a Bering Sea DPG. General discussion led to the following motion.

PCOM Motion

There will not be a Bering Sea-North Pacific DPG. The CEPAC DPG will ask for additional expertise as needed to evaluate the program. (Motion Pisias, second Eldholm)

Vote: for 14; against 0; abstain 1 (absent 1)

CEPAC needs to decide whether they have the necessary expertise to evaluate a Bering Sea program or if they need additional members. A report requesting changes in membership is to be submitted to PCOM by the 2-4 May, 1989 PCOM meeting. Liaisons from OHP should be considered for providing additional expertise.

CEPAC needs to meet to keep the prospectus up-to-date and improve the drilling program. CEPAC should meet according to the work load. The next CEPAC prospectus is expected for the Summer PCOM Meeting. A new prospectus will not have to be prepared for the Spring PCOM Meeting in Oslo.

Discussion next shifted to WPAC and the following motion was made.

PCOM Motion

WPAC will be kept as a DPG, meeting as requested by PCOM to evaluate any new site information affecting the current drilling program, and reporting to PCOM. (Motion Pisias, second Malpas)

Vote: for 14; against 0; abstain 1 (absent 1)

Malpas asked if CEPAC could serve the same purpose as the EPR and Sedimented Ridges Working Group. Becker said that the EPR and Sedimented Ridges Working Group has almost completed their charge, only the EPR Bare Rock drilling proposal is left. Pisias said that it would be a shame to lose the critical mass of expertise assembled for the working group. Malpas asked if CEPAC should turn Sedimented Ridges over to the EPR and Sedimented Ridges Working Group. Shipley suggested that LITHP could make the necessary drilling decisions. Pisias said that the EPR and Sedimented Ridges Working Group has a "corporate history" of working with these problems and have worked out the

experimental design for investigating hydrothermal systems. It was also observed that DPGs meet at the request of PCOM to address specific tasks, so they will meet only if necessary.

PCOM Motion

Create a Sedimented Ridges DPG (SRDPG) out of the existing Working Group to deal with existing proposals for EPR Bare Rock Drilling and Sedimented Ridges and which reports to LITHP, SGPP and TECP. (Motion Pisias, second Malpas)

Vote: for 9; against 1; abstain 5 (absent 1)

SRDPG members are to use their special expertise to help develop a drilling program using the existing proposals and not to write new proposals. CEPAC will turn over the Sedimented Ridges proposals to SRDPG to ensure that the drilling program is correctly prepared. Moberly is to ask R. Detrick if he is willing to continue as chairman of the SRDPG. The membership of this DPG is to remain the same as the overlapping EPR and Sedimented Ridges Working Group.

The general agreement of PCOM was that the Fluid Processes in Accretionary Prisms Working Group should not meet again until the initial report of this group has been circulated. Their status was left in abeyance until PCOM decides if further work is necessary.

760 Watchdog Assignments

The following watchdogs have been assigned to keep track of CEPAC drilling proposals:

J. Malpas	Hawaii Flexure
O. Eldholm	Chile Triple Junction
D. Cowan	Cascadia Accretion
A. Taira	Old Pacific
B. Tucholke	Atolls and Guyots
M. Kastner	Ontong Java Plateau
M. Leinen	Eastern Equatorial Pacific
Y. Lancelot (alt. J. Watkins)	North Pacific Neogene
Y. Lancelot (alt. J. Watkins)	Bering Sea History
H. Jenkyns	Shatsky Rise
J. Malpas	Lower Crust at 504B
G. Brass	EPR Bare Rock Drilling
M. Langseth & M. Kastner	Sedimented Spreading Centers
R. Moberly	Young Hotspots: Loihi

It was suggested that forms need to be established for the watchdogs so that a more uniform way of keeping track of advanced proposals can be implemented. Tucholke and Moberly will draft forms.

Friday, 2 December 1988

761 Jack-up Mobile Platform

In view of such potential ODP drilling as in atoll lagoons, R. Ginsburg spoke about the possible use of a jack-up mobile platform (R/V JUMP) for drilling and recovery of sediments from shallow carbonate banks such as the Bahama Bank. The platform is a self-propelled barge with three hydraulically operated legs that can be operated in up to 200 feet of water. The platform carries enough drill pipe to reach 1000 meters, and additional pipe can be carried on another barge. Chartering cost for the platform is

$5000/day with crew. The drilling rig and crew must be supplied. Drilling of atolls and shallow carbonate banks are used for studies of sea level change and evolution of carbonate platforms. Industry is interested in the studies because they help interpret seismic patterns on these structures. A RSMAS drilling program using one of these rigs is planned for next year with support coming from both NSF and industry.

762 PCOM Liaisons to Panels

The following liaisons were established between PCOM and panels.

	TECP	LITHP	SGPP	OHP	TEDCOM	IHP	SSP	SMP	PPSP	DMP
G. Brass		*			*					
D. Cowan										*
O. Eldholm	*									
H. Jenkyns				*						
M. Kastner			*							
Y. Lancelot						*	*			
M. Langseth										*
M. Leinen								*		
J. Malpas		*								
R. Moberly									*	
N. Pisias				*		*				
T. Shipley										
A. Taira								*		
B. Tucholke	*									
U. von Rad			*							
J. Watkins							*			

The following liaisons were established between PCOM and DPGs:

M. Langseth and M. Kastner	SRDPG
M. Leinen and R. Moberly	CEPAC
A. Taira	WPAC

It was reaffirmed that DPGs report to Thematic Panels who report to PCOM by way of the PCOM Chairman or the PCOM Liaison to the Thematic Panel.

763 New Panel Members

TEDCOM New person to be invited to join TEDCOM is Prof. Heinrich Rischmüller, providing KTB Drilling Group pays his expenses; which von Rad said would be the case. New international partner panel members are: J. Bonnasse-Gahot (France), A. Milton (UK), and H. Strand (ESF).

SSP R. Kidd (UK) was nominated as the new SSP chairman to replace G. Mountain. PCOM Chairman is to ask USSAC for nominations for a U.S. panel member with expertise in petroleum geology. New international partner panel members are: K. Louden (Canada) and G. Pautot (France). SMP panel member F. Duennebier is rotating off USSAC, but PCOM member J. Watkins (SSP liaison) is still a USSAC member. A liaison between SMP and SSP still needs to be nominated. PCOM reaffirmed its policy that persons serving as NSF program officers are disqualified from membership in JOIDES panels.

LITHP R. Batiza will be the new LITHP chairman. New persons to be invited to join LITHP are: Don Forsyth (1st choice), J. Phipps Morgan (2nd choice) or Marc Parmentier (3rd choice) to replace M. McNutt; and Guy Smith (1st choice), P. Johnson (2nd choice), or M. Tivey (3rd choice) to replace N. Petersen. New international partner panel member is: S. Cloetingh (ESF). Suggested LITHP liaisons to other panels, M. Perfit-CEPAC, D. Forsyth-TECP, L. Cathles-SGPP, were accepted.

IHP New persons to be invited to join IHP are: H. Spall (1st choice), J. Aaron (2nd choice) or E. Smith (3rd choice) to replace M. Latremouille. Others suggested are R. Buchanan, J. Thyfault, R. Cole, and P. Ryan. IHP wants someone with managing-editor skills. New international partner panel members are: J. Sanders (ESF), A. Schaaf (France), K. Tamaki (Japan). Someone may be needed to replace I. Gibson's expertise in computers.

SGPP E. Suess is the new SGPP chairman. Transfers from SOHP are: P. Froelich, M. Goldhaber, L. Mayer, and W. Normark. After considerable discussion, H. Elderfield will transfer from LITHP and remain a member-at-large, and new nominees are: N. Christie-Blick or J. Thorne; N. James; F. Prahl; and S. Dreiss. New international partner panel members are: J. Boulegue (France), F. Masuda (Japan), J. McKenzie (ESF), J. Mienert (FRG), and D. Stow (UK). The panel is directed to make an evaluation of the expertise of its membership in regards to meeting its mandate, and report for the next PCOM meeting.

OHP N. Shackleton is the new OHP chairman. Transfers from SOHP are: W. Berger, A. Droxler, R. Garrison, D. Kent, R. Stein, T. Saito, E. Vincent. New nominees are: A. Mix or L. Peterson; M. Delaney or E. Boyle; W. Berggren or J. Lipps; E. Baron or J. Parish. New international partner panel member is: E. Jansen (ESF).

TECP TECP had pointed out the need for replacements but made no specific new membership recommendations. PCOM recommendations and decisions will be deferred until after the next TECP Panel meeting. New international partner panel member is: H.C. Larsen (ESF).

DMP New invitees to join DMP are: R. Morin (physical properties), J. Gieskes (sampling fluids and chemistry), P. Lysne (high temperature work). PCOM decided that M. Hutchinson (industry logging experience) be reconsidered when E. Howell leaves panel in one year. New international partner panel members are: J.P. Foucher (France) and O. Stephansson (ESF).

SMP K. Moran is the chairman of the new SMP. New person to be invited to join the SMP is M. Mottl for his expertise in shipboard chemical measurements. New members who were previously invited to join and have accepted are: J. King, M. Rhodes and E. Thomas. New international partner panel members are: I. Gibson (Canada), A. Richards (ESF), H. Tokuyama (Japan) and J.P. Valet (France). Francis says the UK will try to nominate someone with underway geophysics experience.

It was decided that Panel Chairman should make specific nominations for any necessary liaison between panels and DPGs.

764 Co-Chief Scientist Nominations

The following are the PCOM recommendations for Co-Chief Scientists, based on the nominations by WPAC, CEPAC and SOHP, with such modifications by PCOM and international partners as are indicated. Those who are not US are so indicated.

Geochemical Reference

C. Langmuir, J. Natland, H. Staudigel, M. Leinen, M. Salisbury (Canada), F. Alberede (France), R. Kay From the initial panel list, Francis for the UK withdrew the nomination of A. Robertson. PCOM added Kay to the list. J. Natland got a strong endorsement.

Ontong Java Plateau

L. Mayer (Canada), W. Berger, N. Shackleton (UK), J. Resig, L. Kroenke, L. Peterson, W. Curry. PCOM added Peterson and Curry to the list.

NE Australia Margin

P. Davies (Australia), P. Symmonds (Australia), R. Sarg, A. Droxler, J. McKenzie (ESF), A. Bosselini (ESF), W. Schlager (ESF), R. Ginsburg, N. James (Canada), J. Ladd. PCOM added Ladd to the list. Canada indicated its first choice is Davies. ESF listed this priority: 1 McKenzie; 2 Bosselini; 3 Schlager.

Vanuatu

J-I. Collot (France), M. Fisher, H.G. Green, J. Recy (France), S. Bloomer, D. Falvey (Australia), L. Kroenke. PCOM added Falvey and Kroenke to the list. France's priority is: 1 Collot; 2 Recy.

Lau-Tonga

J. Hawkins, J. Gill, J. Erzinger (FRG), L. Parson (UK), H. Foucher (France), D. Scholl, S. Bloomer, A. Stevenson. From the initial panel list, Francis for the UK withdrew the nomination of D. Cronan, and von Rad for FRG replaced U. von Stackelburg with J. Erzinger.

765 Remaining Agenda Items

In the new thematically driven program, all thematic panels should evaluate all proposals, but if the proposal is outside of the panel's mandate they can indicate they have no interest in it.

There will be a Guidelines Special Issue of the JOIDES Journal giving new information on panel mandates. The JOIDES Journal will go back to the old format and publish an updated membership directory in each issue.

Moberly asked everyone to read item M in the agenda book, The JOIDES Planning Year. Panel Chairman should especially take note that having panel meetings as short as two weeks before PCOM meetings makes it hard to incorporate panel advice into the agenda.

Pisias was concerned that PCOM and panels should be preparing to plan Eastern Pacific drilling at the next Annual Meeting. He recommended that the SRDPG be given the specific charge of starting to prepare for a hydrology leg for the Sedimented Ridge program (as recommended by LITHP) and CEPAC be given the specific charge of starting to prepare a leg for the Cascadia program. Moberly said that the minutes will reflect that specific charges will be given when the meetings are requested.

Langseth said that two other nearly mature programs should also be included, one leg of drilling on the EPR and one leg for the Eastern Equatorial Pacific Neogene. Both of these programs should have site specific surveys by the PCOM Annual Meeting, and a cost analysis should be done as well.

Pisias said that this process should start as soon as possible, and proponents of these programs should also be aware that they are being considered for drilling. Langseth emphasized that this should not be taken to indicate that they are in the drilling program, but only that they are under serious consideration.

Moberly asked if there were any institutional recommendations or comments to the letter from EXCOM Chairman Helsley concerning balanced discipline representation on PCOM and the possibility of longer terms for PCOM members. Kastner said that a letter had been sent by Scripps to the EXCOM Chairman. Cowan said the University of Washington sees no compelling reason to extend PCOM membership beyond 4 years.

Concerning the letter from C. Sancetta on a separate electronic-mail bulletin board for JOIDES, E. Kappel said that there is an Drilling Bulletin Board on OMNET and JOI will consider one on KOSMOS. BITNET has no bulletin boards. Moberly asked Kappel to talk to Sancetta about the matter.

Moberly called attention to the information on the new JOIDES Planning Office at the Hawaii Institute of Geophysics. Important for speedier mail are the street number, 2525 Correa Road, and the zip code, 96822.

von Rad was concerned about communications concerning who would or would not be able to attend meetings, since alternates need to be contacted to cover the meeting. The JOI Office in Washington keeps track of this information. Moberly said the JOIDES Planning Office can be contacted if there is a problem contacting JOI.

766 Future PCOM Meetings

1989 Spring PCOM Meeting will be from 2-4 May 1989 in Oslo and will be hosted by the ESCO-secretariat.

1989 Summer PCOM Meeting will be from 22-24 August 1989 in Seattle and will be hosted by the University of Washington. US PCOM members will be asked to attend the USSAC meeting that will overlap on the following day.

1989 Fall Annual PCOM Meeting will be a four day meeting from 27-30 November 1989 in Woods Hole and hosted by WHOI.

1990 Spring PCOM Meeting will be from 24-26 April 1990 in France.

O. Eldholm went over the plans that are being made for the Oslo meeting (Appendix P). Preliminary arrangements are being made to hold the meeting at the Conference Room at the Voksenåsen Hotel in the hills above Oslo. A two-day field trip is being planned which includes the Oslo Rift and a range of geologic topics. Eldholm will help arrange accommodations for those arriving early or staying on after the meeting. A questionnaire concerning travel plans, hotel accommodations and field trip will sent out by Eldholm in January.

767 Other Business

PCOM Consensus

The PCOM chairman should ask the IOP chairman (R. Schlich) to convene a panel meeting including invited guests consisting of Leg Co-Chief Scientists, Science Operator, Bore Hole Research Group, and others as needed to examine the objectives and achievements of the Indian Ocean drilling program and the causes and possible remedies for any disparities between the objectives of drilling and the results thereof and to provide a report to PCOM on their findings before the 2-4 May, 1989 PCOM meeting. In addition a second report emphasizing the exciting thematic results of Indian Ocean drilling should be prepared for publication in EOS as soon as possible.

PCOM also decided that in general at the end of a regional planning group's task that a meeting such as the one proposed for the IOP be held as a "post-mortem", to examine the drilling objectives and achievements of that program, including technical and logistical problems and their possible solutions.

Taira wanted the problem of publications placed as an agenda item for the Oslo PCOM Meeting. Japanese participants on ODP legs would like to publish their data as soon as possible. Moberly said that this will be a major agenda item.

PCOM Consensus

PCOM urges that the acquisition of two Digital Borehole Televiewers be advanced to the earliest time possible so that an improved stress-measurement program can be implemented.

768 Conclusion of the Meeting

The Planning Committee expressed appreciation to the following persons and groups of individuals:

Jean-Paul Cadet, Tim Francis, and Steve Gartner for their dedicated service on PCOM.

Nick Pisias and his subcommittee for their efforts in developing the Long-Range Planning Document.

Doris Rucker who is retiring from the JOI office and whose help over the years has benefitted us all and deserves recognition.

Keir Becker for "pitching in" and organizing logistics for this meeting, and also to Chris Harrison who graciously extended the RSMAS facilities and made our stay here more pleasant.

Outgoing Panel Chairmen Jamie Austin (ARP), Peter Barker (SOP), Bob Detrick (LITHP), Larry Mayer (SOHP), Roland Schlich (IOP), and Brian Taylor (WPAC) for their stewardships.

The Lau Working Group for its efforts.

Members of the regional panels (ARP, IOP, SOP) which have been disbanded and those other panel members who are leaving.

The 1988 Annual PCOM Meeting was adjourned at 1:10 p.m.

APPENDICES TO MIAMI PCOM MINUTES

A List of handouts at 28 November - 2 December 1988 PCOM meeting

B Report of 13-15 September 1988 EXCOM meeting in Edinburgh

C FY89 NSF-ODP Program Budget and Anticipated Expenditures

D JOI FY89-90 Budget Summary

E Draft Minutes Interim Executive Committee of the Nansen Arctic Drilling Project

F Wireline Logging Operator Report 28 November 1988

G Southern Ocean Panel, Annual Report 1988

H Site Survey Panel, Annual Report 1988

I Pollution Prevention and Safety Panel, Annual Report 1988

J Information Handling Panel, Annual Report 1988

K Annual Report and Minutes of 1988 Panel Chairmen Meeting

L Diamond Coring System and 124E Preliminary Test Plan

M Development Engineering Schedules

N Proposed European Drilling Vessel

O Leg 122 Major Objectives

P Information sheet on Spring 1989 PCOM meeting in Oslo

Minutes received after Miami agenda book (due to postal delays):

Q Technology and Engineering Development Committee, 28 September 1988

R Site Survey Panel, 4-6 October 1988

T Pollution Prevention and Safety Panel, 10-11 November 1988

List of handouts at Miami PCOM meeting

1. Draft Minutes Interim Executive Committee of the Nansen Arctic Drilling Project
2. Long-Range Planning Document
3. SOHP Long Term Planning Document - First Draft, Nov. 1988
4. JOIDES Sediments and Ocean History Panel White Paper - Second Draft, Nov. 1988
5. Wireline Logging Operator Report 28 November 1988
6. Southern Ocean Panel, Annual Report 1988
7. SSP Status Report on Site Survey Completeness
8. Annual Report and Minutes of 1988 Panel Chairmen Meeting
9. Diamond Coring System and 124E Preliminary Test Plan
10. Cretaceous Resources, Events and Rhythms - A Research Project of the Global Sedimentary Geology Program International Union of Geological Sciences

Appendix A

1. EXCOM (N. Pisias)

The last EXCOM Meeting was held 13-15 September in Edinburgh, Scotland. Results of that meeting that are of interest to PCOM are summarized below.

- EXCOM reviewed the outline of the JOIDES Long-range Planning Document (to define the goals and objectives of post-1992 drilling), and in general agreed that its development should continue as planned. Among the points raised were how goals vs. achievements should be measured, especially relative to COSOD I, which may have been too ambitious. More future attention should be given to visibility, public relations, and public education. There must be a close interface between ODP and other global research programs. It ismost important to build a sound science program first, then to decide on the specifics of implementing it.

- EXCOM reviewed the new advisory structure of JOIDES and the Terms of Reference for its components. All were approved, with modest revisions to the mandate for the Site Survey Panel (to make it clear that SSP does not evaluate the merit of proposals), the Terms of Reference of the Budget Committee (to separate BCOM from within the EXCOM terms), and the Terms of Reference of EXCOM (to remove obsolete language relative to the transition from IPOD/DSDP to ODP).

- Results of a number of reviews were reported to EXCOM. An Administrative Cost Review Panel performed cost analyses of TAMU and JOI (favorable). A Performance Evaluation Committee visited JOI and all subcontractors (preliminary report favorable; final report in April 1989). The National Science Board conducted a programatic review of ODP (overall, very positive; main areas of improvement needed in thematic publications, the level of engineering development, and in addressing highest-order objectives of COSOD I and II).

- EXCOM commended PCOM for its consistent approach to developing the thematically driven planning process, and approved strongly the four points of consensus of PCOM at its Oxford meeting of how to proceed. EXCOM thought, however, that the specific wording of the PCOM motion for implementation was inappropriate. EXCOM's motion was, *At the November 1989 Annual PCOM meeting, and at subsequent meetings, PCOM will examine thematicallly reviewed proposals in any ocean, in order to plan a general direction of the vessel in the period after 1991.* (15 for, 0 against, 1 absent).

- Some concern was expressed that the ship might not be returning to the Atlantic. It was pointed out that a return to the Atlantic was not precluded by the planning process, but until proposals addressing scientific objectives in the Atlantic are received the path of the ship cannot be directed there.

- EXCOM recommended that a Canada-Australia consortium for ocean drilling be accepted as a member of JOIDES, to supercede the Canadian membership when an appropriate MOU is signed with NSF.

- EXCOM reaffirmed its earlier resolution, and recommended that the U. S. government take steps to secure full ODP membership for the USSR.

Appendix B

FISCAL YEAR 1989 NSF/ODP PROGRAM BUDGET

TOTAL APPROPRIATION = $32,100,000

ODP OPERATIONS AND MANAGEMENT	$ 21,150,000
U.S. SCIENCE SUPPORT (USSAC)	$ 4,530,000
NSF/ODP UNSOLICITED GRANTS	$ 5,184,000
NSF/OCE SPECIAL PROGRAMS	$ 1,236,000
TOTAL=	$ 32,100,000

ODP OPERATIONS/MANAGEMENT PROGRAM PLAN = $ 36,150,000

U. S. = $ 21,150,000
INTERNATIONAL = $ 15,000,000

Appendix C

FY 1989 NSF/ODP ANTICIPATED EXPENDITURES- GRANTS

I. FIELD PROGRAMS

A. NEW= ODP

1)	KULM/MOORE	MCS/SEAMARC - OREGON MARGIN
2)	HAYMON/FORNARI	ARGO SURVEY - EAST PACIFIC RISE
3)	PISIAS	SEDIMENTATION IN EASTERN PACIFIC
4)	SHIPLEY/LARSON	OLD PACIFIC SEISMIC STUDY
5)	HAWKINS	LAU BASIN SEISMICS

TOTAL = $1,500,000

B. NEW= JOINT WITH MGG

1)	BENDER/LANGMUIR	PETROLOGY/GEOCHEMISTRY- EPR
2)	?? MCNUTT	MCS- MARQUESAS/SOCIETIES

TOTAL = $300,000

C. SHIPTIME FOR ABOVE

TOTAL = 1,700,000

D. DATA ANALYSIS

1)	SHIPLEY/LARSON	OLD PACIFIC
2)	CANDE	CHILE TRIPLE JUNCTION
3)	PRELL	OMAN MARGIN
4)	WINTERER, ET AL	WEST PACIFIC GUYOTS

TOTAL = $540,000

II. Downhole Experiments and Instrumentation

1)	Becker	Packer Experiments
2)	Spiess	Re-entry televiewer
3)	Karig	Geoprops

TOTAL = $280,000

III. Syntheses, Infrastructure, Miscellaneous

TOTAL = $864,000

GRANTS TOTAL = $5,184,000

Table PP-7 FY89-92 Budget Summary ($K)

	FY89			FY90			FY91			FY92		
	Std.	SOE	Total	Std.	SOE	Total	Std.	SOE	Total	Std.	SOE	Total
TAMU												
Eng. Develop.	1223	290	1513	1325	400	1725	1391	300	1691	1461	400	1861
Drilling Ops.	1899	115	2014	1996	700	2696	2096	900	2996	2200	400	2600
Tech. Support	2338		2338	2432		2432	2553		2553	2681		2681
Logistics	698		698	726		726	762		762	800		800
Sci. Operations	776		776	791	150	941	831		831	873	150	1023
Publications	1687		1687	1754		1754	1842		1842	1934		1934
Computer Ser.	765		765	780		780	819		819	860		860
Data Base	180	17	197	187		187	197		197	206		206
Curation	700		700	729		729	765		765	804		804
Headquarters	1665		1665	1716		1716	1802		1802	1892		1892
Subtotal	11931	422	12353	12436	1250	13686	13058	1200	14258	13711	950	14661
Ship Operations	18573	588	19161	19553		19553	20140		20140	20703		20703
Total TAMU	**30,504**	**1,010**	**31,514**	**31,989**	**1,250**	**33,239**	**33,198**	**1,200**	**34,398**	**34,414**	**950**	**35,364**
L-DGO												
General	1190	155	1345	1227		1227	1324	100	1424	1366	200	1566
Schlumberger	1585	93	1678	1802		1802	1853		1853	1988		1988
Total LDGO	**2,775**	**248**	**3,023**	**3,029**		**3,029**	**3,177**	**100**	**3,277**	**3,354**	**200**	**3,554**
JOI	1600	13	1613	1664		1664	1747		1747	1835		1835
Total Uncommitted SOE		0			68			578			1247	
Totals	**34,879**	**1,271**	**36,150**	**36,682**	**1,318**	**38,000**	**38,122**	**1,878**	**40,000**	**39,603**	**2,397**	**42,000**
NSF Target			*36,150*			*38,000*			*39,000*			*40,000*

Appendix D

DRAFT MINUTES

INTERIM EXECUTIVE COMMITTEE OF THE NANSEN ARCTIC DRILLING PROJECT

11 OCTOBER 1988

BREMEN, F.R. GERMANY

In attendance:

Tore Vorren, Norway
Jan Backman, Sweden
Deiter Futterer, F.R. Germany
Leonard Johnson, U.S.A.
Birger Larsen, Denmark
Larry Mayer, Canada

1.0 Introduction:

The meeting was called to order by Tore Vorren who briefly reviewed the `Scientific Drilling in the Arctic Ocean' meetng of 23-24 June in Ottawa and at which the charge for this committee was first established. Following the conclusions of the Ottawa meeting, T. Vorren wrote to government agencies in Canada, Denmark, Germany, Norway, Sweden, U.S.S.R,and the U.S.A. requesting the appoinment of a representative to serve on the Interim Executive Committee.

Canada, Germany, Norway and the U.S. have responded appointing Mayer, Futterer, Vorren, and Johnson, respectively. Sweden, Denmark, and the U.S.S.R have not yet responded.

Backman reported that the Swedish Polar Research Secretariat has been extremely busy with the Antarctic Treaty but now that they have concluded the work, should soon act on Vorren's request.

Larsen reported that the issue is somewhat of a political `hot potato' in Denmark with Vorren's request being passed back and forth between the Greenland Science Research Office and the Greenland Geological Survey. The problem seems to be a concern over a major financial committment. Vorren suggested that the message be passed on to the Greenland Geological Survey that participation in the Interin Executive Committee requires no funding other than for the travel costs of their representative. L. Johnson will be in Denmark soon and will discuss this with the appropriate parties. In the mean time B.

Appendix E

Larsen has responded as an interested individual and would like to participate as an individual until some official action is taken.

2.0 Name of organization:

The Norwegian Academy of Sciences has proposed that the organization be called the `Nansen Arctic Ocean Drilling Program' and use the acronym NAD.

This was agreed to by all present.

3.0 Chairman:

Tore Vorren was elected Chairman by acclamation.

4.0 Secretariat:

Canada has offerred to provide a scretariat for the committee. L. Mayer will be interim secretary.

5.0 Participation:

It was decided that the organization should be open to all nations that have a reasonable expectation of contributing to NAD. As a first step in attracting other participants T. Vorren will send a letter of invitation and the charter (see below) to:

France -- L. Mayer will provide name of contact
Japan -- to the director of the Polar Inst. in Tokyo -- L. Johnson will provide details.
U. K. -- J. Bowman at NERC

6.0 Relationships with other organizations:

Two organizations, ODP and the Intl. Arctic Science Commission were initially identified as key organizations with which the Committee should interact.

ODP --

At the Ottawa meeting, Tom Pyle of JOI Inc. expressed the willingness of the Ocean Drilling Program to offer assistance in terms of planning, scientific and safety review and technology transfer.

L. Mayer reported that the ODP advisory panels are presently preparing their long-term plans and that the Sediments and Ocean History Panel has identified Arctic drilling as a key part of their plan. The long-term plan also calls for official ODP liason with NAD.

The key to driving the drilling program towards the Arctic is the submission of a number of excellent drilling proposals that provide the necessary scientific justification. NAD Executive Committee members are reminded to encourage the members of their scientific communties to submit proposals and to keep in contact with their PCOM representatives about the status of Arctic drilling.

It is hoped that enough excellent Arctic drilling proposals are submitted to require the formation of a Detailed Planning Group for Arctic Drilling. The NAD executive committee is happy to offer its expertise in Arctic matters and any assistance possible to ODP. We are most confident that NAD and ODP can work together to the benefit of both organization

International Science Commission:

The disposition of this commission is still uncertain and will probably not be finalized until after the Leningrad meeting of 14-15 December. We will wait until after the Leningrad meeting to act, but hope that collaboration with the Commission can be established.

7.0 Next Action:

The Interim Executive Committee would like to see the Technology Committee established as soon as possible. Each member of the Executive Committee will request a nomination for membership of the Technical Committee from their respective countries. Keith Manchester (Canada) will be asked to Chair this committee.

8.0 Charter revisions:

Minor revisions were made to the draft Charter. A revised version of the charter is enclosed.

NANSEN ARCTIC OCEAN DRILLING, (NAD)

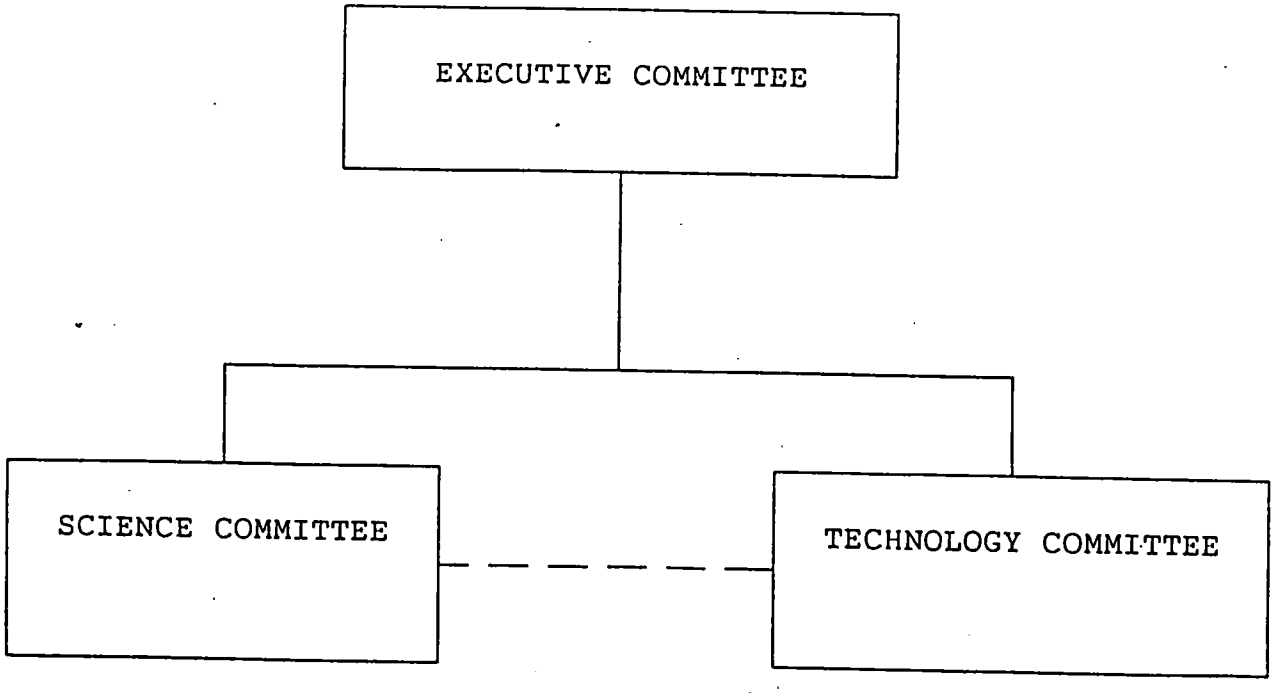
Objectives

The Arctic Ocean Basin and adjacent extensive continental margins are poorly understood in terms of their tectonic and paleoenvironmental history. The primary goals of the NAD-research are to develop a satisfactory understanding of:

(1) the climatic and paleoceanographic evolution of the Arctic region and its effects on global climate, biosphere, and the dynamics of the world´s ocean and atmosphere; and

(2) the nature and evolution of the major structural features of the Arctic Ocean Basin and circum-Arctic continental margins.

Organization



Executive committee:

1. This committee shall formulate science, policy and implementation recommendations with respect to the Arctic Ocean Drilling.

2. The Executive Committee shall be advocates for the NAD-program by interacting with the international scientific community. Formal ties to international scientific programs such as the Nansen Centennial Arctic Program and ODP shall be established by this committee.

3. The Executive Committee shall work to obtain funds for the NAD program from national research councils, industrial and other potential sources.

4. Membership: Membership will be open to countries who have a reasonable expectation of contributing resource to the NAD program.

   The membership of this committee will be comprised of one representative of each country.

   Members of the Executive Committee shall be representative of institutions or agencies which have a major scientific interest in the study of the Arctic sea-floor.

5. The Executive Committee shall consider recommendations by the science and technology committees to establish panels and subcommittees and establish a policy for consideration of safety and environment issues.

6. The Executive Committee shall reach all its decisions by the affirmative vote of a majotity of the members present. If a member of the Executive Committee is absent from a duly called meeting, he or she may designate an alternate from his or her country with full authority to act in his or her absence.

Science committee

1. The Science Committee shall define and recommend research priorities and plans for Arctic Ocean drilling to the Executive Committee.

2. The Science Committee shall convene conferences on scientific objectives of Arctic Ocean geological and geophysical research.

3. Membership: Each member of the Executive Committee shall designate one member of the Science Committee and an alternate to serve in the absence of the designated member.

Technology committee

1. The Technology Committee is responsible for recommending and evaluating drilling-platforms, drilling-tools, drilling-techniques and other technology-related issues to meet the scientific objectives.

2. The Technology Committee shall identify new drilling-platforms, drilling-tools, drilling and loggging techniques to be developed.

3. The Technology Committee shall recommend to the Executive Committee plans designated to optimize scientific Arctic Ocean drilling.

4. Membership: Each member of the Executive Committee shall designate one member of the Technology Committee and an alternate to serve in the absence of the designated member.

Nov 28, 1988
Miami

Ocean Drilling Program

Planning Committee

Wireline Logging Operator Report

A. Update of Performance Since Last PCOM

Leg 122: Six holes logged, none lost. However, 1000 m of loggable hole lost to bridging of sands (not clay swelling problem). When Side-entry Sub (SES) was finally allowed to be used, it worked spectacularly allowing 1425 m of open hole to be logged. An additional 681 m were logged through pipe using the Geochemical Logging Tool.

Leg 123: Hole 765 cased to 933 m, deepest cased hole into oceanic crust. Terrible hole conditions for logging prior to setting of casing. Using SES, following logs acquired:

0-181 mbsf (inside pipe) - Natural Gamma Spectroscopy (NGT) + porosity
181-420 (open hole) - SS + LD
420-525 (inside pipe) - NGT + porosity
525-640 (open) - SS
640-660 (inside pipe) - NGT
660-742 (open hole) - SS
933-1180 (open hole) - SS
169-1166 (through casing) - Geochemical Logging Tool (GLT)

GLT became stuck "impossibly" in 11 3/4 " casing at 169

Appendix F

mbsf, but mysteriously came free just as cut-and-crimp proceedure was to begin. Test of open hole vs through casing GLT lost on this leg, but repeated NGT runs through open hole, casing, bottom hole assembly and pipe accomplished. Hydrofracture failed to break rock, but permeability test showed high permeability.

Hole 766 logged open hole only to near basement interface at 443 mbsf. GLT successful through pipe from 527 m T.D. to sea floor.

Leg 124: Hole 767B successfully logged, thanks only to SES. SS hit bridge at 298 mbsf. SES added to string and with monumental struggle, SS to 648 m and GLT to 662 m were recorded.

B. Science

Leg 122: Sequence stratigraphy, subsidence, sea level change, and the K-T boundary.

Leg 123: Turbidites Aptian to Miocene shown as repeated fining upward sequences and by Th/U versus U/K ratios . Neutron and density logs correlated with carbonate profiles from core, then used to detect bases of turbidites, especially in poorly recovered lower Miocene. Another K-T boundary. Compaction from M-N. Extensive breakouts in basement give maximum horizontal compressive stress direction of N-S.

C. Technical Progress

Formation Microscanner to be shipped Xmas to Houston, expect deployment for Leg 126. Working on software now.

Wireline Packer land tests showed repeated failures of pump. Would burn-up motor after 8 hours of running time.

Stanford contacted Amoco about allowing TAM International to use their 1 1/2 hp downhole motor in ODP packer. Tentative YES pending negotiation of non-disclosure agreement between Amoco and TAM. Borehole tests still scheduled at Lamont first week in December. Deployment for 124E in jeopardy.

Engineering Test Leg

- GLT tests open-hole vs through pipe on schedule with improved Boron sleeve.

- HLDT Combo tests of hardware and software on schedule.

- WHC tests on schedule with inventor, Toby Potter, sailing on leg.

- SES hot-hole circulating tests on schedule.

D. Future Developments

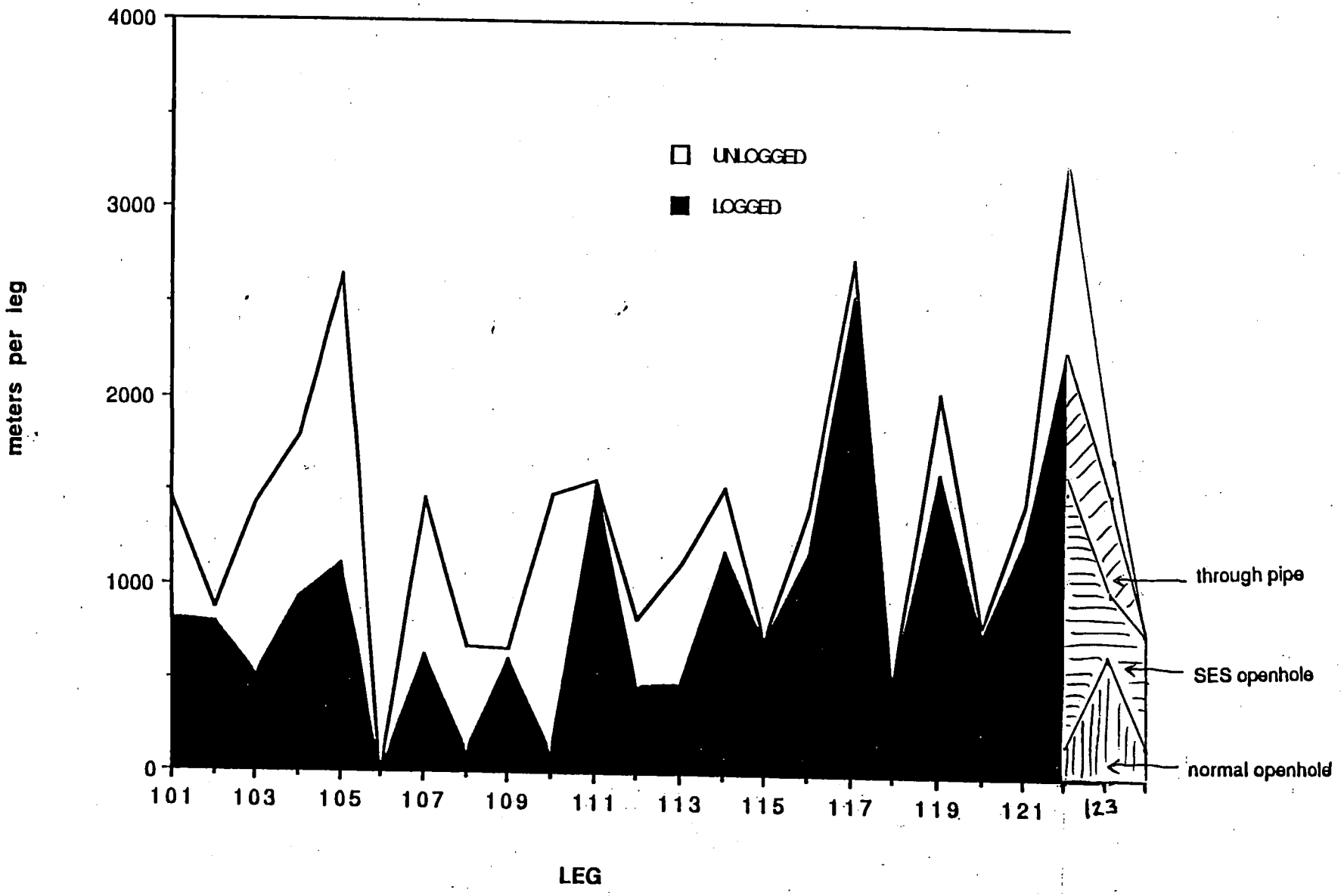
Logging Manual, Volume 3, "Perspectives on Scientific Logging from the Ocean Drilling Program" published in time for GSA Logging school in November.

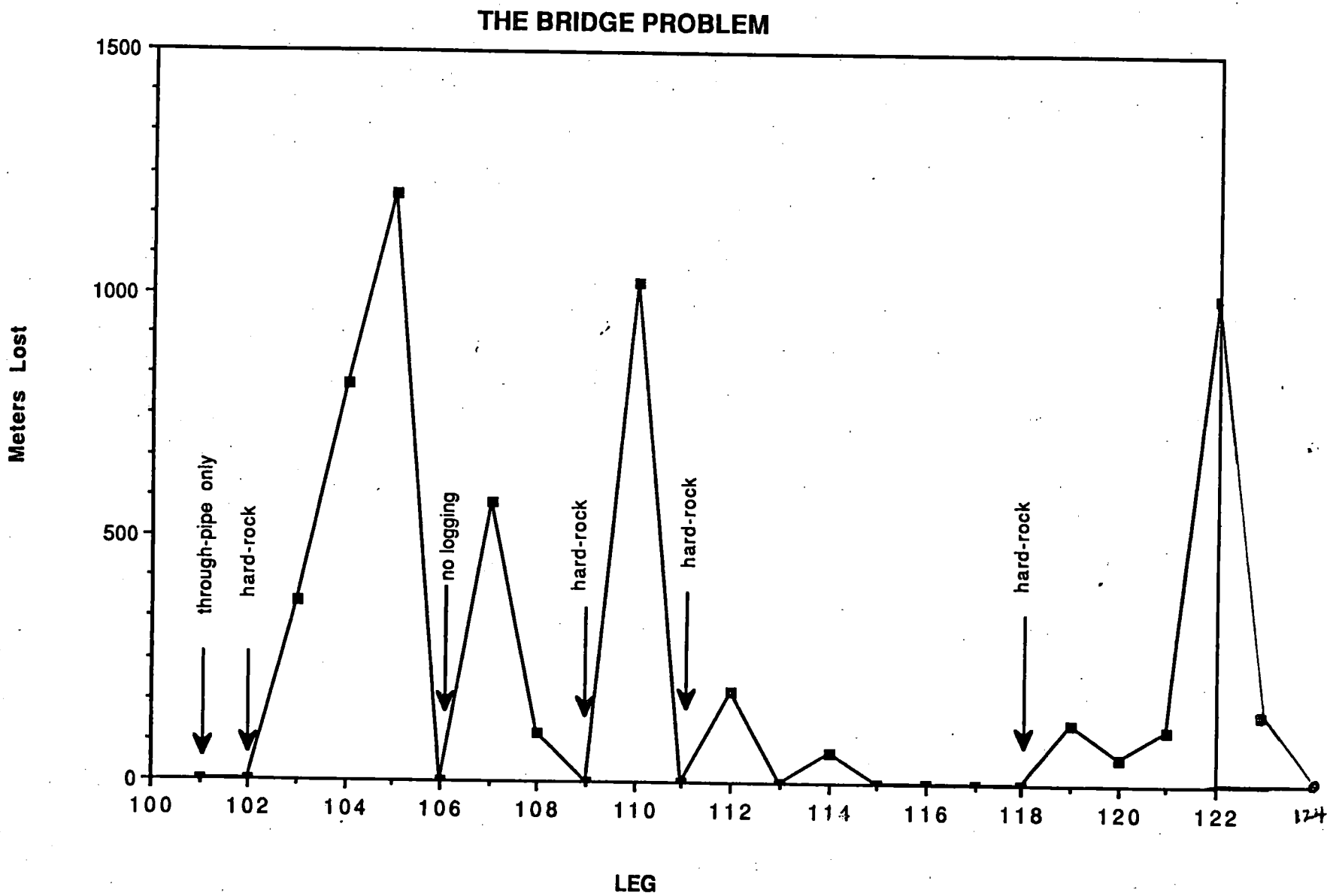
Logging Schools: AGU in San Francisco in December, International Geological Congress in Washington in Spring, 1989, holding discussions with Canadians for a School !

Invited to give Logging School at the Institute of Crustal Dynamics, Beijing, in the spring of 1989. EXCOM said NO.

Logging Data Exchange: The Coordinating Committee on Continental Drilling of the International Lithosphere Program (IUGG-IUGS) has requested that ODP Logging Data be included in the proposed International Logging Database for Scientific Drillholes, with repositories in Moscow and the U.S. EXCOM said to continue sending data through NGSDC.

Insurance Rate Increase: Because of excessive tool losses, rates have gone up to point where we break even with one tool loss per year. Deductible must be deposited in advance. Discussions with TAMU Engineering has led to a "safer" logging policy of fewer centralized tools, sea water muds used all the time, written proceedures for SES use, cut-and-crimp, cut-and-strip, and fishing, and more involvement of SEDCO and Schlumberger in fishing operations.


4000
3000
2000
1000
0
meters per leg
UNLOGGED
LOGGED
through pipe
SES openhole
normal openhole
101
103
105
107
109
111
113
115
117
119
121
123
LEG


THE BRIDGE PROBLEM
1500
1000
500
0
Meters Lost
through-pipe only
hard-rock
no logging
hard-rock
hard-rock
hard-rock
100
102
104
106
108
110
112
114
116
118
120
122
124
LEG

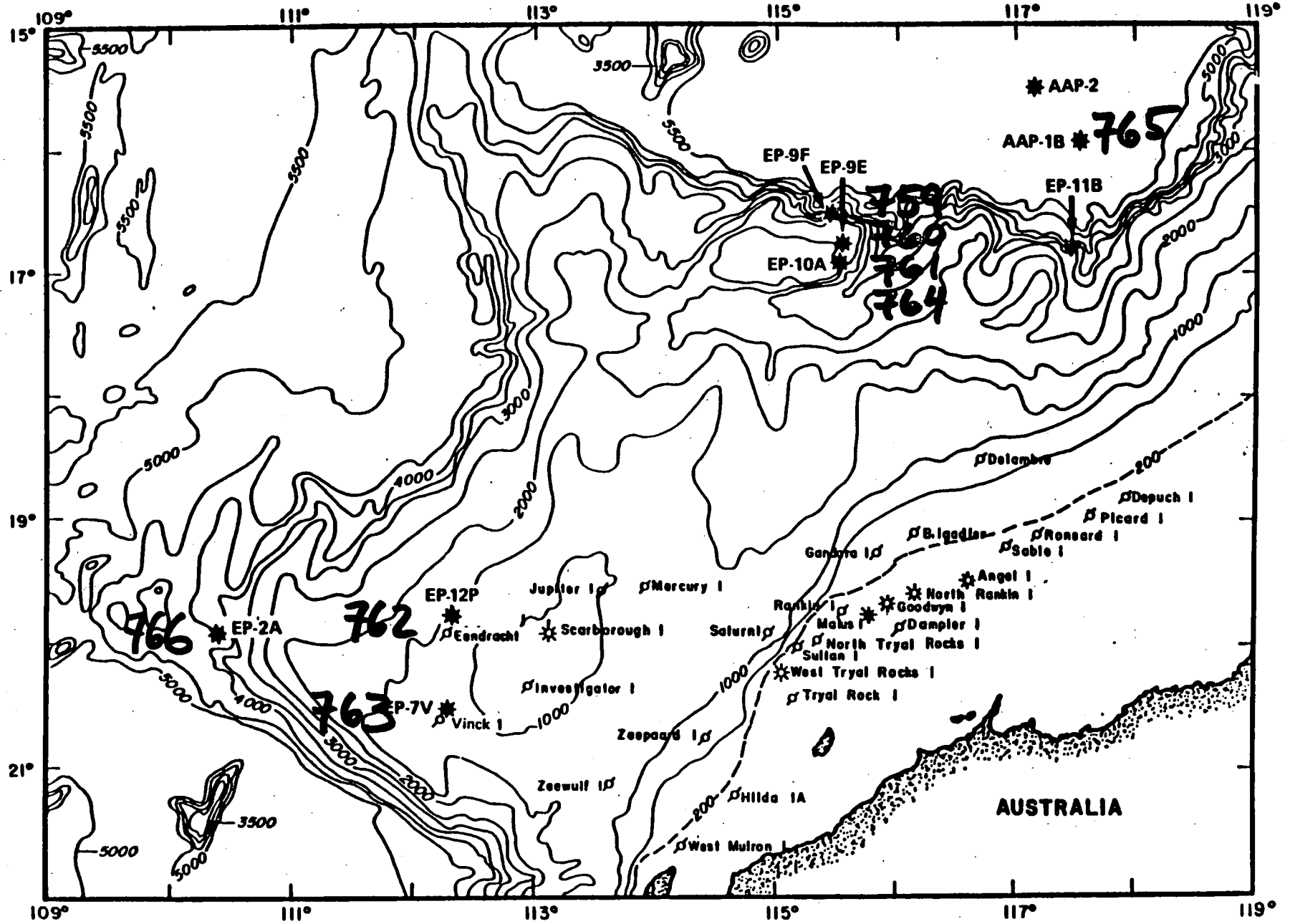
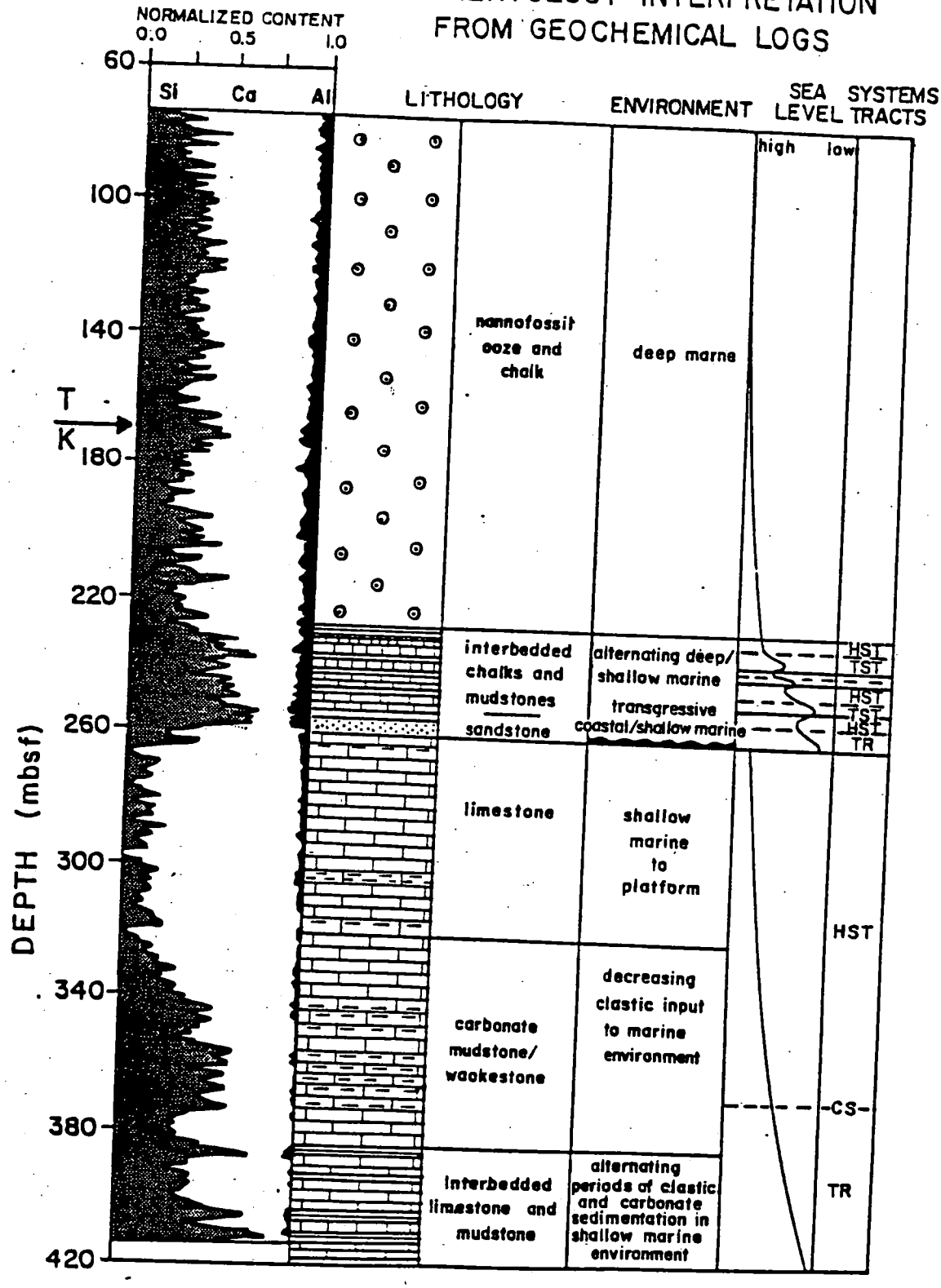
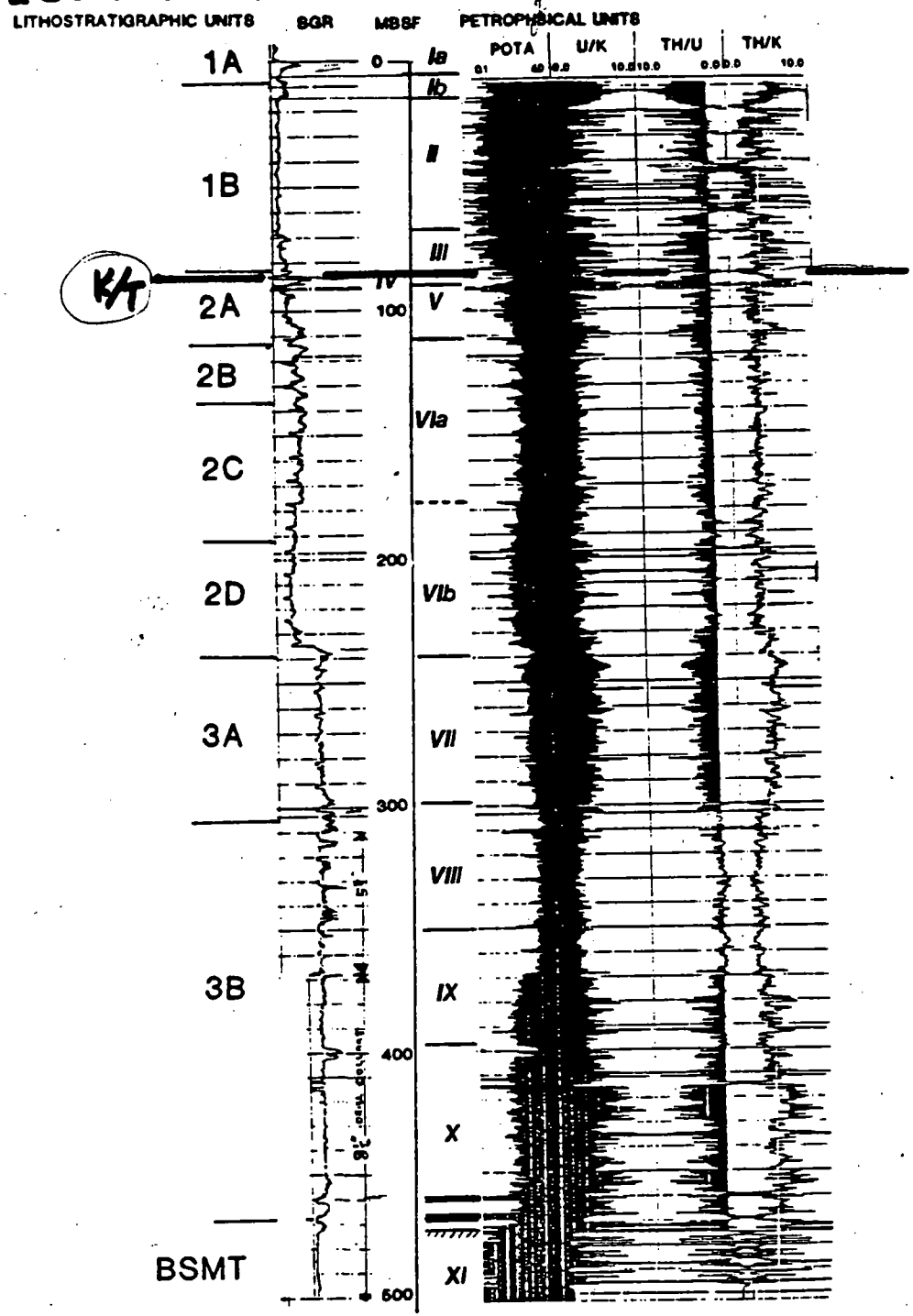


Figure 2. Bathymetric map of Exmouth Plateau and vicinity with location of planned ODP sites (bold stars) and commercial wells (open circles, modified from Exon, BMR unpub. data). Bathymetry in meters.

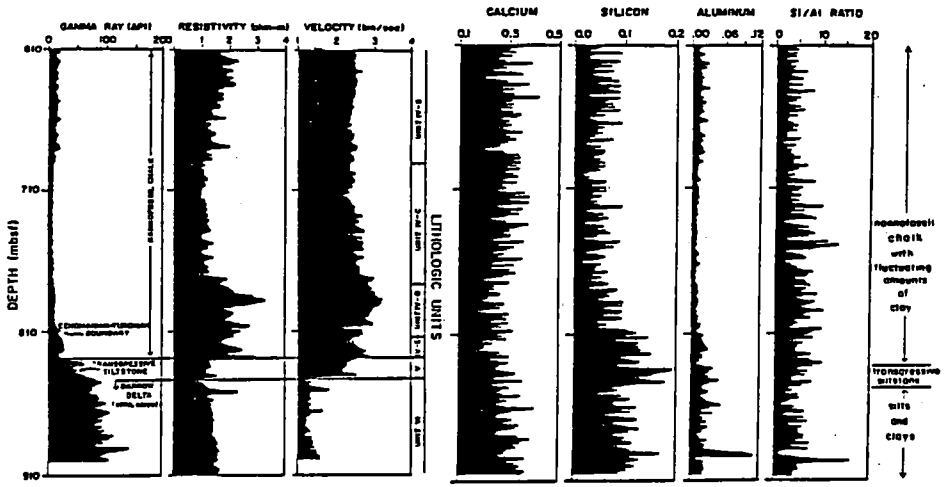
LEG 122 HOLE 761
SEDIMENTOLOGY INTERPRETATION FROM GEOCHEMICAL LOGS



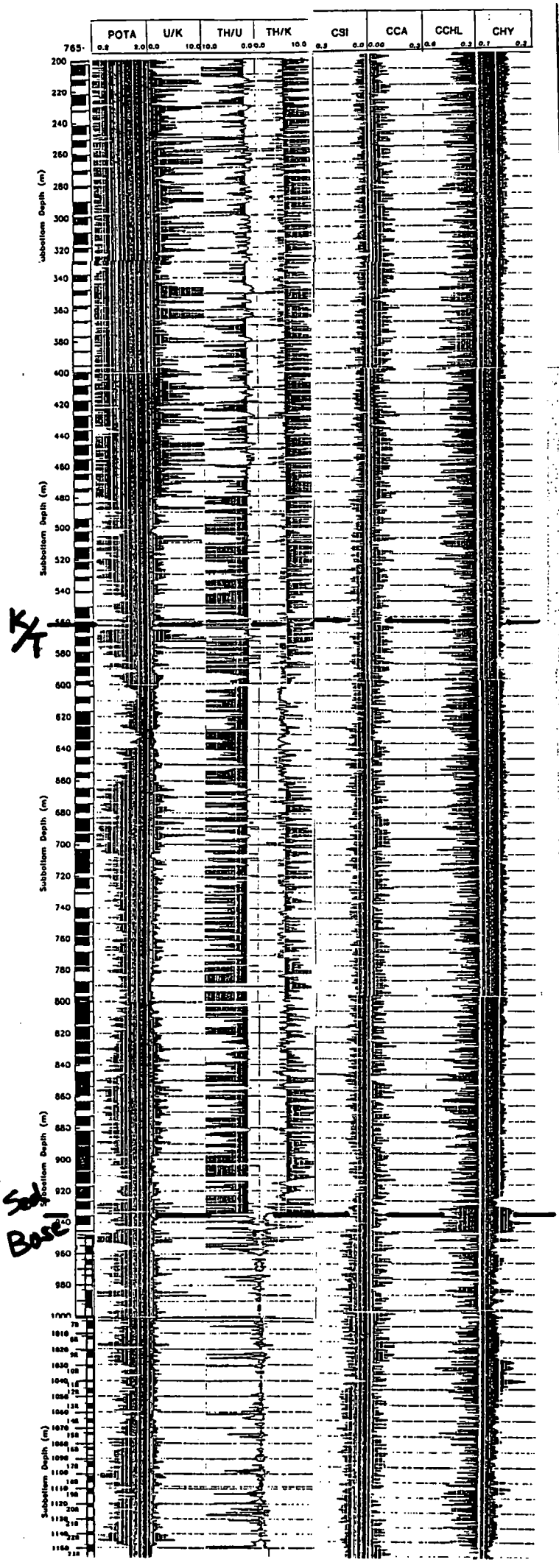
LEG 123 HOLE 766



LEG 122 HOLE 762C



LEG 123
Hole 765



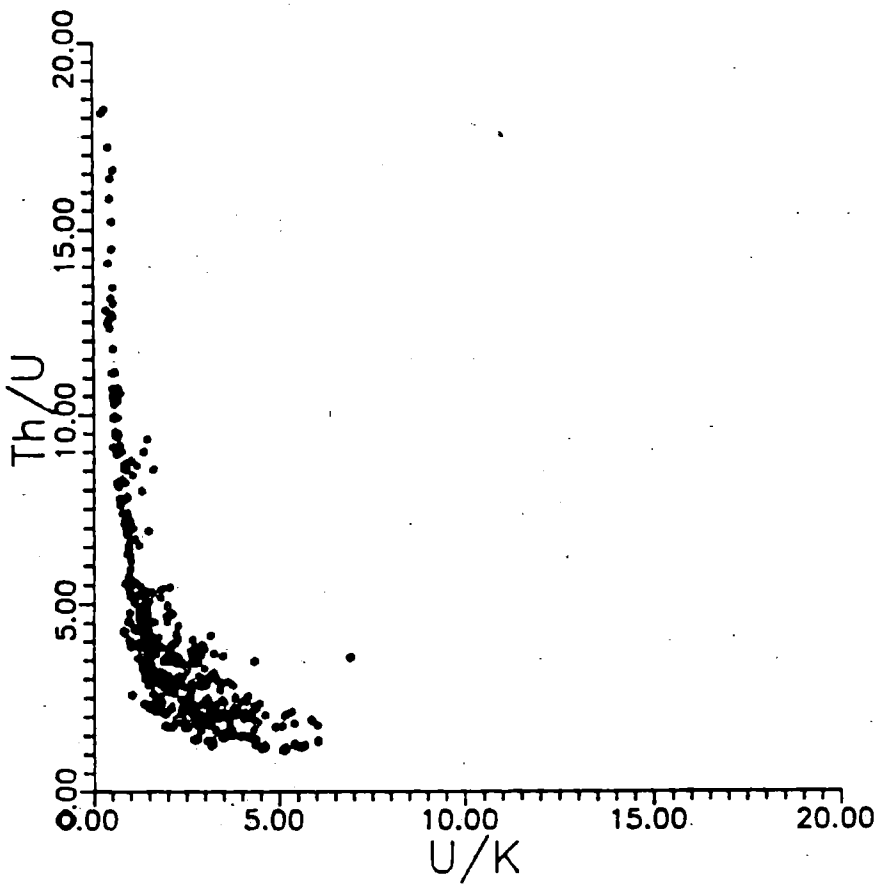


Figure 765-T-9: Crossplot of Th/U versus U/K for the Miocene interval 160 to 460 mbsf in hole 765C.

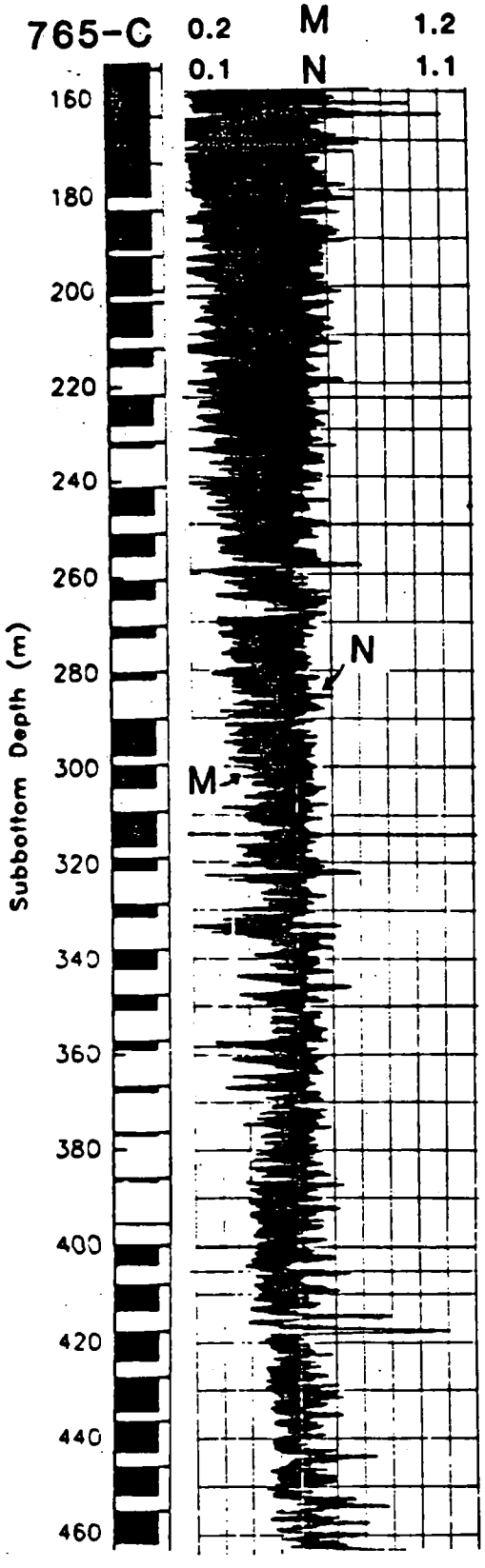
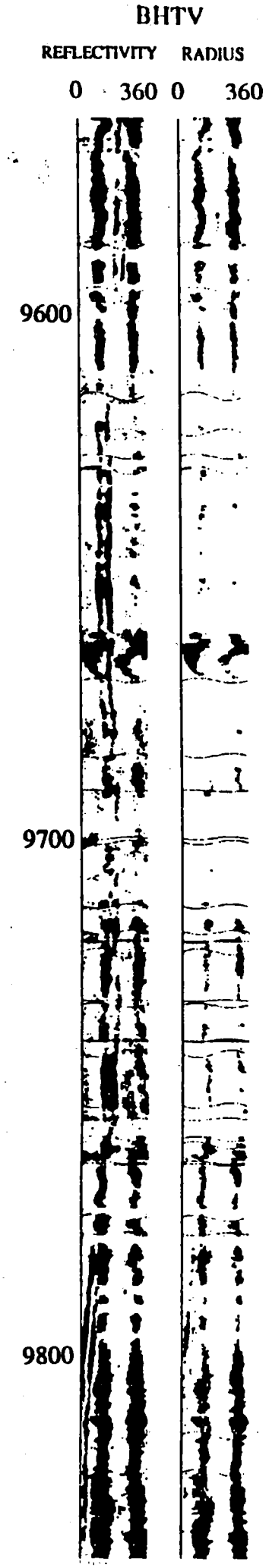
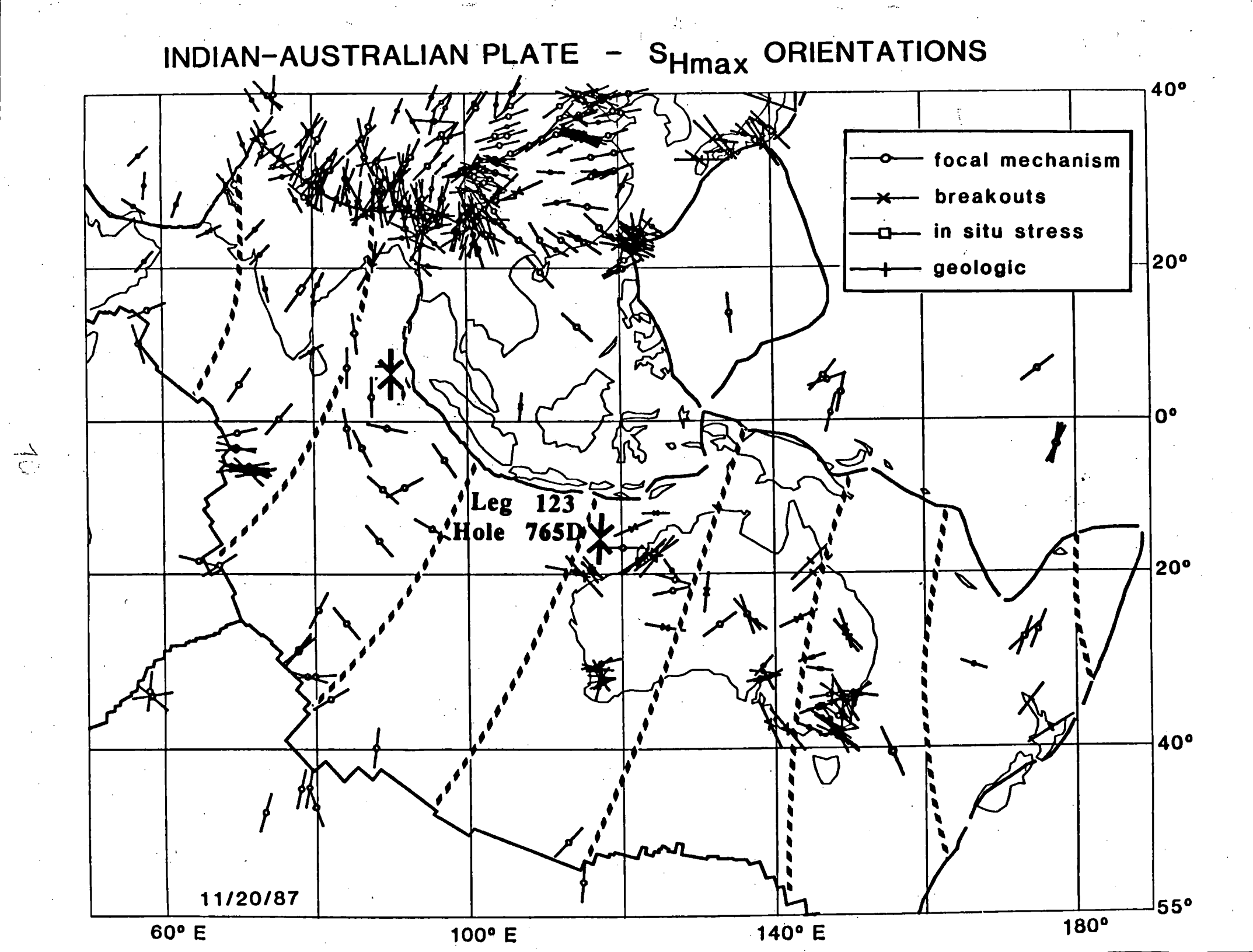
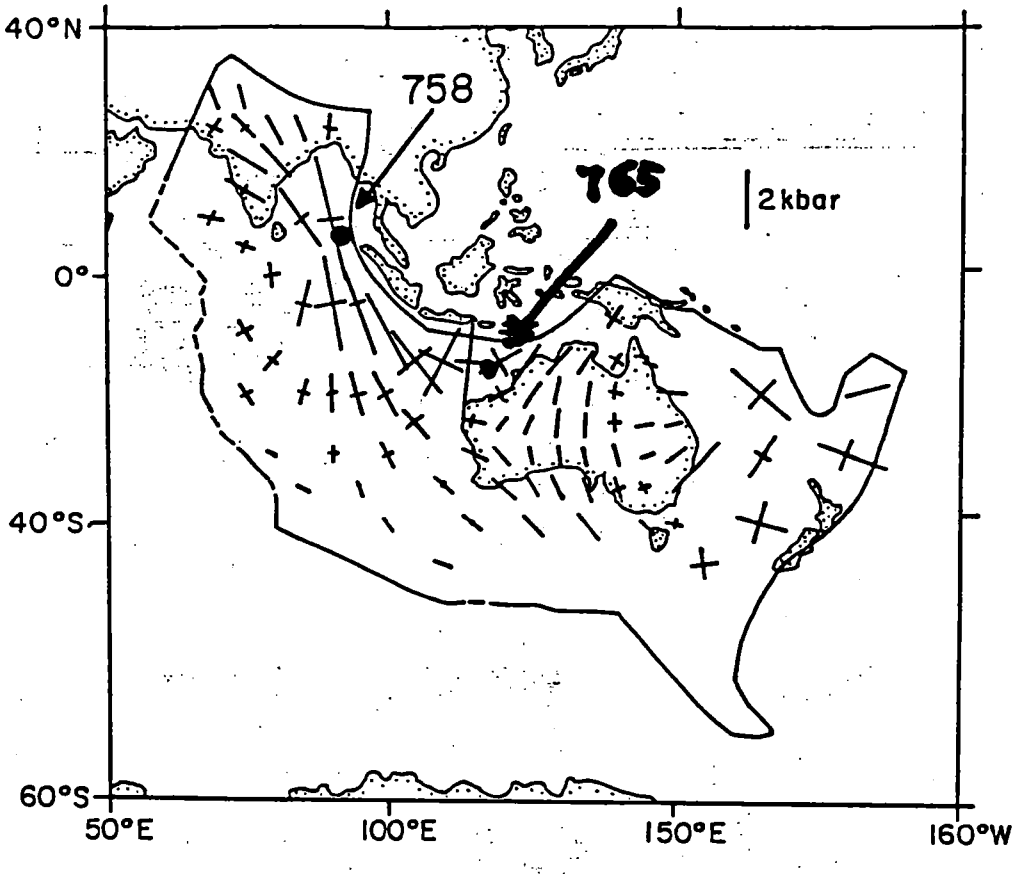


Figure 765-T-8: Hole 765C depth plot of M and N.

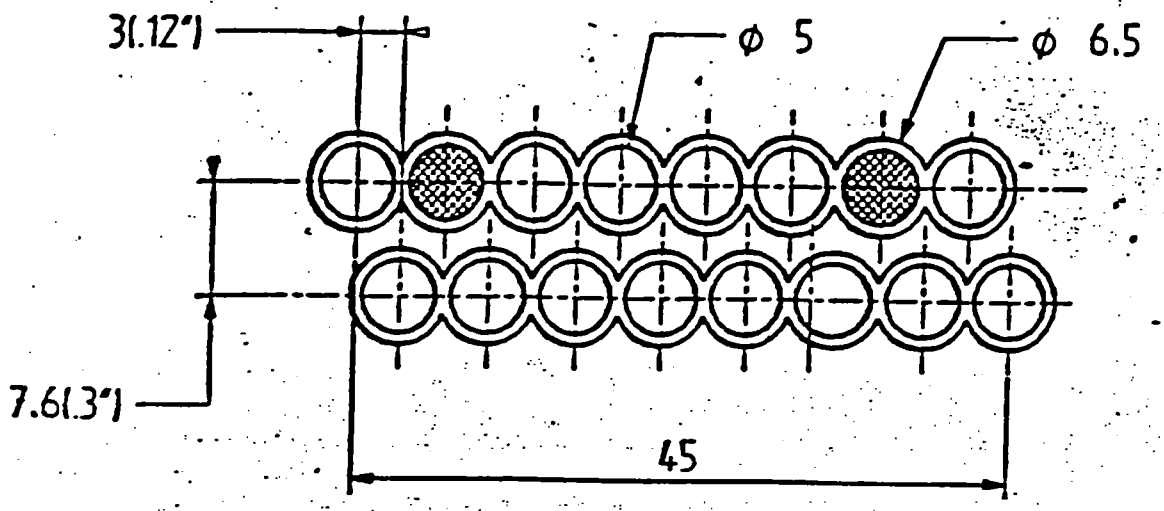
LEG 123
HOLE 765D



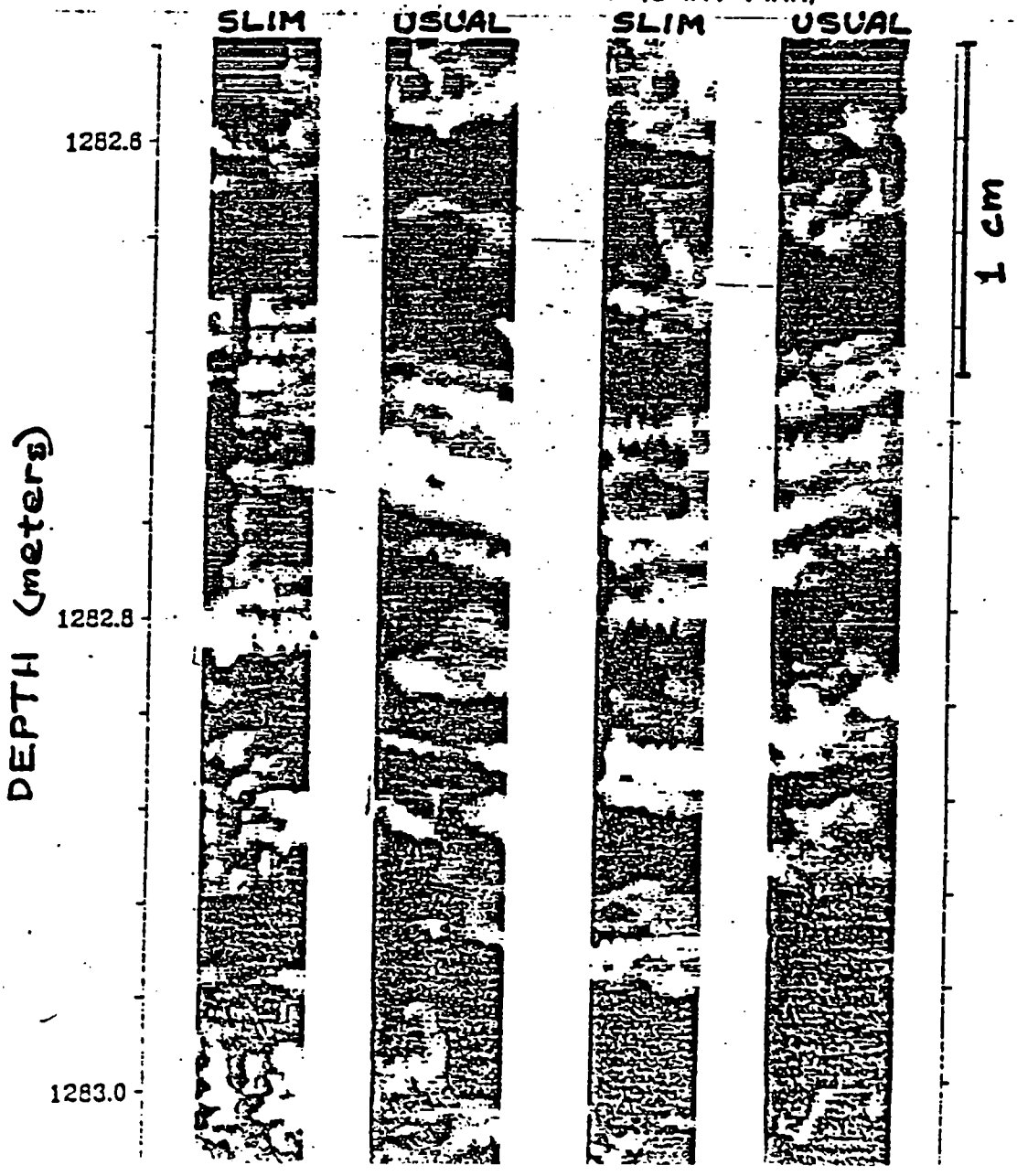

INDIAN-AUSTRALIAN PLATE - S_{Hmax} ORIENTATIONS
focal mechanism
breakouts
in situ stress
geologic
Leg 123
Hole 765D
11/20/87
40°
20°
0°
20°
40°
55°
60° E
100° E
140° E
180°


40°N
0°
40°S
60°S
50°E
100°E
150°E
160°W
758
765
2 kbar

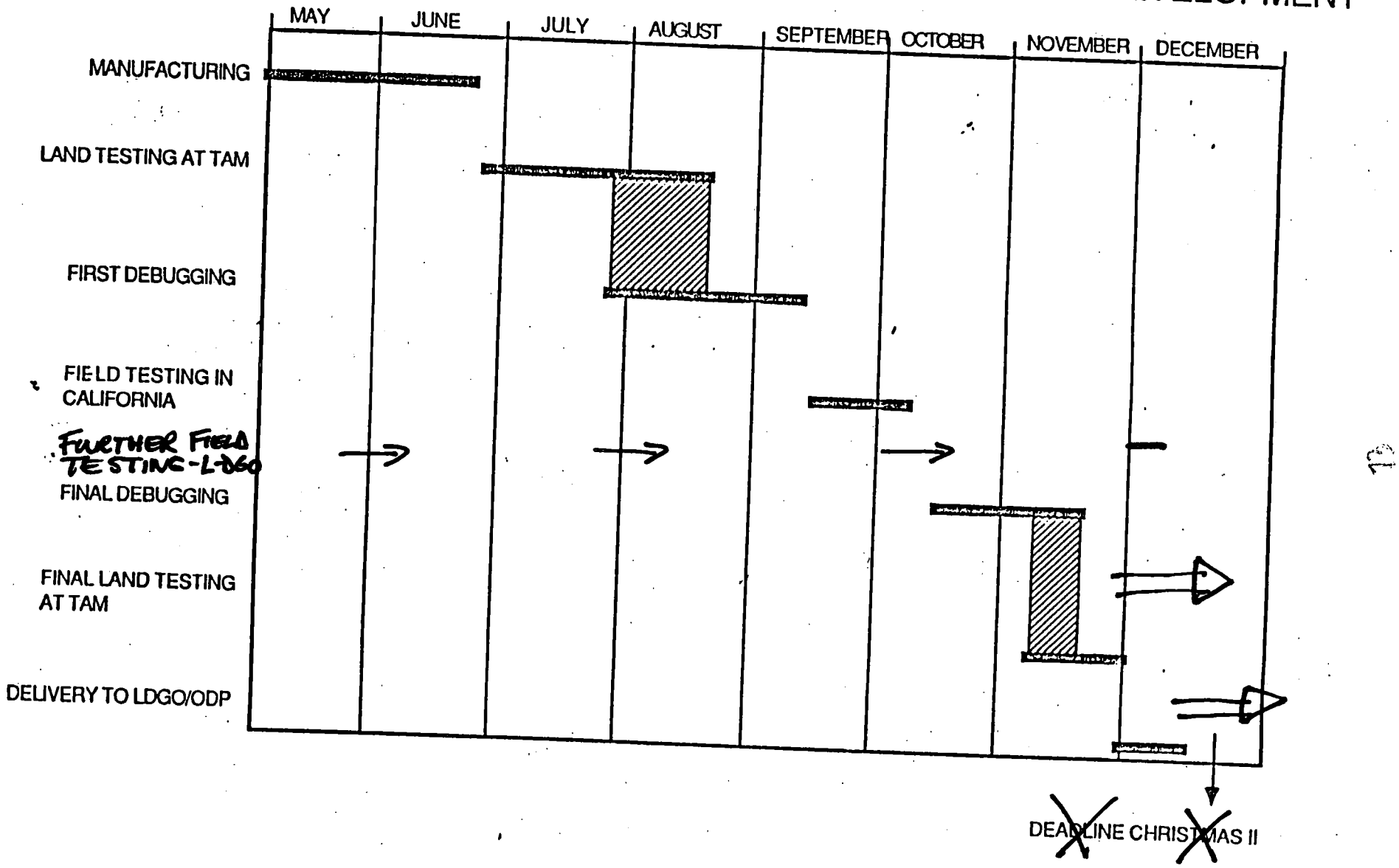
SLIM FORMATION MICROSCANNER (FMS)



HIGH RESOLUTION PAD ARRAY (SHR / MHR)



TIME SCHEDULE FOR TAM WIRELINE-PERMEABILITY-SYSTEM DEVELOPMENT



SOUTHERN OCEAN PANEL, ANNUAL REPORT 1988

1. 1988 has been a successful year for the SOP, in the sense that Legs 119 and 120, to the Kerguelen Plateau and Prydz Bay, were successfully carried out. There were problems during these legs (and the very sad death of Lamar Hayes during Leg 120) but the main objectives were achieved. It was particularly pleasing that the drill ship was able to get into Prydz Bay and drill the shelf glacial sequences there. We look forward to the results of shore lab studies on material collected during both legs.

2. The SOP did not meet during 1988. Its last meeting, in October 1987, reviewed existing proposals in anticipation of the interim structure, in which the thematic panels undertake initial review of proposals; since no new Antarctic drilling was imminent, it was clear that there was no active role for the SOP in 1988.

3. It seemed most likely that the panel would not meet again, but for most of the year it was not certain what would be happening. The strongest rumour I heard said we were formally disbanded from 1 October 1988. I mention this only in support of a memo to PCOM (or more appropriately perhaps XCOM). It seems very likely that none of the scientists who serve on regional panels have heard directly that their services are no longer required (except by default, by scanning pp 47-59 of the October JJ). How about someone representing the organisation writing a thank-you note?

4.The last time it met, the main concern of the SOP about the future was that the structural changes in ODP would not encourage the flow of proposals into the system. Certainly the ship would continue drilling, but the number of active scientists within the advisory structure was being reduced, and review of proposals would be less supportive, possibly more cursory and certainly more directed (thematic). The constituency for drilling might decrease. There is often a conflict between efficiency and democracy: ODP knows it has chosen efficiency, but may not realise that it has made a choice. The problem may only become apparent at fund renewal time.

For the Southern Ocean constituency, there is now no supporting pressure group within the system. SOP foresees less active interest in Southern Ocean drilling, at a time when one might expect considerable interest stemming from the 4 legs recently drilled. The preliminaries to a drilling proposal (site survey etcetera) take so much longer in such remote areas, that fewer may undertake them on the offchance of interesting a thematic panel whose own interests may have changed in the meantime.

We shall see. Meantime, perhaps the thematic panels should consider strengthening their regional representation? And be prepared to encourage proposals at a more preliminary stage.

5. Last month, in the US on other business, my breakfast-time TV previewed an upcoming 5-minute interview with 5 billionaires. One of them had made his pile by transforming a small sand and gravel business into a conglomerate.

Maybe he can improve core recovery too?

Peter Burke

November 1988

Appendix G

Thematic Priorities of Existing Southern Ocean Proposals

1. SUMMARY

Several proposals should be of interest to the new OHP and SGPP (water mass evolution, glacial control of sea level change) and to TECP (divergent margins, ridge subduction). LITHP will have no interest in high latitude drilling until the ship next goes there.

2. INTRO

June 1988 JOIDES Journal lists the following Southern Ocean proposals. Those crossed through have been drilled during the last 2 Austral seasons (113,114,119,120). Figure 1 shows the locations of those remaining.

SOUTHERN OCEANS			
~~64/C~~	~~Sub-Antarctic & Weddell Sea Sites~~	~~(Kennett)~~	~~9/84~~
71/C	Drilling on the Shaka Ridge [idea proposal]	(Sclater)	7/84
73/C	Antarctic Margin off Adelie Coast	(Wannesson, et al)	8/84
~~108/C~~	~~E Antarctic Cont. Margin (Prydz Bay)~~	~~(SOP)~~	~~9/87~~
~~109/C~~	~~Kerguelen - Heard Plateau~~	~~(SOP - Kennett)~~	~~10/84~~
110/C	Wilkesland - Adelie Cont. Margin	(SOP -Kennett)	10/84
~~111/C~~	~~SE Indian Ocean Ridge Transect (Subantarc)~~	~~(SOP - Kennett)~~	~~10/84~~
114/C	Crozet Plateau	(SOP -Kennett)	10/84
129/C	Bounty Trough	(Davy)	5/86*
~~136/C~~	~~Kerguelen - Heard Plateau~~	~~(Schlich, et al)~~	~~7/85*~~
169/C	S Tasman Rise	(Hinz & Dostmann)	7/85
~~195/C~~	~~Kerguelen Plateau: Origin, Evol. & Paleo.~~	~~(Coffin, et al)~~	~~9/85~~
209/C	Eltanin Fracture Zone	(Dunn)	1/86
228/C	Weddell Sea (E Antarctic Cont. Margin)	(Hinz, et al)	5/86
230/C	Wilkes Land Margin, E Antarctica	(Eittreim, et al)	5/86
~~244/C~~	~~W Ross Sea~~	~~(Cooper, et al)~~	~~9/86*~~
~~270/C~~	~~S Kerguelen Plateau~~	~~(Schlich, et al)~~	~~9/87~~
296/C	Ross Sea, Antarctica (Subs. for 244/C)	(Cooper, et al)	12/87
297/C	Pacific Margin, Antarctic Peninsula	(Barker, et al)	12/87

Please bear in mind also that two USSAC Workshops (South Pacific, South Atlantic) have highlighted many targets of considerable interest. The SOP had very limited success in persuading any of the proponents of those Workshop topics to work them up into independent proposals. The main barrier was a disbelief that such effort would be able to attract drilling. That barrier is now higher in the perception of the community: ODP appears as more of a closed shop under the new structure than before. Many of the BEST potential targets, of high thematic interest, lie within those Workshop reports.

3. SOHP Interest

Instead of trying to decide where the boundary between the new OHP and SGPP will lie, we will use the SOHP White Paper as a general guide to combined interest.

3.1 Short-period changes (Neogene)

The proposal most relevant to this theme is 209/C (Eltanin Fracture Zone) by Dean Dunn. It proposed two transects (N-S and

NW-SE) on the flanks of the EPR near the EFZ, to examine the Cenozoic development of the Polar Front. The SOP thought very highly of this target: it has said repeatedly that the Pacific sector is the right sector to examine Polar Front development, since there are no topographic constrictions to distort the climatic signal and encourage non-deposition/erosion. SOP argued for the proposal to be extended into a N-S transect from the continental margin to 30°S, to include sub-tropical fronts, and to form 2 parallel lines, on 2 anomalies (possibly 6c and 21). Neither Dunn nor anyone else has been willing to put the effort into raising site survey time, to develop this into a mature proposal. SOP thought that it was necessary to survey the sites properly, to be able to pick the most continuous sections: the existing (mainly Eltanin) data are sparse.

The proposal also bears on SOHP Objective 3 (Longer-period, Palaeogene), since the sections extend well back into the Eocene and would record the development of the psychrosphere in the Pacific sector before the Southern Ocean became completely circumpolar. SOHP Objective 4 (Palaeo-productivity) is also relevant, since the Paleogene S Pacific silica and carbon budgets are unknown.

3.2 Sea-Level History

One proposal (129/C, Bounty Trough, Davey) addresses this problem in the traditional sense, offering a carbonate section where a transect of sites might observe direct and indirect evidence of sea-level change, in a part of the world clearly decoupled from the Atlantic.

More fundamentally, the importance of drilling the Antarctic margin to test models of sea-level change caused by changes in the volume of grounded ice, does not appear to be appreciated. The Antarctic continental shelf is completely different from those of lower latitudes. It is much deeper (average ca. 300-400m), and is systematically deeper inshore than at the shelf edge. Ice sheets are probably grounded out to the shelf edge at glacial maxima, and carry a basal layer of unsorted glacial till to the shelf break during glacial advance and maximum. During retreat and interglacials, little terrigenous sediment reaches the shelf edge and beyond, except by ice rafting: shelf and slope deposition is sparse and largely pelagic. The outer shelf is built from the prograding glacial sequences, which reflect glacial cycles (particularly ice volume) precisely. A direct comparison is possible therefore, by drilling the outer shelf, between stratigraphic sequences from temperate margins and their hypothesised cause.

Prydz Bay drilling adopted this model, although Prydz Bay drilling did not sample the younger sequences. Several Southern Ocean proposals offer this drilling opportunity, although the opportunity is not always defined within the proposal. Proposals 73/C (Adelie margin, Wannesson) and 230/C (Wilkes margin, Eittreim) have other, deeper objectives, but could be used for this study. Proposal 296/C (Ross Sea, Cooper) also includes seismic sections across the continental margin which show prograding, presumed glacial sequences. The fourth relevant proposal (Antarctic Peninsula, Barker) includes both tectonic and these glacial process/history objectives.

The perceived problems are the poor recovery in the likely lithologies (mainly overcompacted till) in Prydz Bay, and poor stratigraphic control. The first shows signs of being overcome if the Diamond Coring System is successful, since these lithologies can be very successfully drilled from thick fast ice (eg CIROS-1). The

second is not bad: diatom ooze and diatomaceous mud is laid down on shelf and slope during interglacials, and either buried by or marginally reworked within the next glacial sequence. Dating should be good enough to define third-order Vail cycles, which is what the Antarctic seismic profiles appear to show.

Please note that some aspects of SOHP Objective 6 (Depositional evidence of uplift) are included in these same 4 proposals, since all deal with terrigenous sequences. Both the Ross Sea and the Antarctic Peninsula proposals deal more directly with this topic, the former in connection with the very important (climatically) Transantarctic Mountains uplift in the Neogene, the latter in connection with vertical movement at an active margin, related to ridge crest subduction. Note also that in both cases the vertical motion from these long-term tectonic processes can be clearly separated from the glacio-eustatic effects described above.

3.3 Other SOHP matters

Of the other outstanding Southern Ocean proposals, 114/C (Crozet Plateau, SOP) uses the plateau as a dipstick in the sub-Antarctic water masses (rather like Leg 114 in the South Atlantic). The South Tasman Rise proposal (169/C, Hinz) is concerned mainly with transtensional tectonics associated with plate separation, but the gateway to the south is of some palaeo-oceanographic importance, and the sequences to be drilled may be recording the early stages of opening, when connections were all shallow. Also relevant to gateway-type problems (which the SOHP White Paper does not emphasise) is the Ross Sea drilling (296/C), which considers that there have been pre-glacial and deglacial or interglacial seaways <u>through</u> Antarctica. The entire problem of an extensive Pliocene deglaciation will not go away: the direct continental evidence grows stronger, and challenges the validity of oxygen isotopic variation as a simple record of ice volume. A high-resolution record of glacial advance and retreat seems badly needed.

One proposal not drilled by Leg 113, but retained as a contingency site, is of interest to concern no.5 (geochemical cycling etc). It was to drill a geothermal zone with anomalous chemistry, in Bransfield Strait, and was proposed by Erwin Seuss, but for some reason does not appear in the OIDES Journal list. resumably the IDES Office has a proposal somewhere? Bransfield Strait is also mentioned in the TECP White Paper.

4. <u>TECP Interest</u>

4.1 Plate kinematics.

SOP has no record of 71/C (Shaka Ridge, Sclater), but we assume it could belong here! Shaka Ridge is a ?fracture zone/?hotspot trace off the western SWIR. Also, part of Dunn's Eltanin FZ proposal (209/C) is concerned with plate motions, and drilling on specific, well-formed magnetic anomalies will help refine the MRTS. SOP thought that combination of this drilling with a programme of ridge-crest dredging would also contribute to the mantle heterogeneity/mantle roll debate.

4.2 Divergent margins.

Both the Wilkes and Adelie margins proposals (73/C and 230/C) had as their main interest the early history of extension. SOP tried to persuade the proponents to combine their proposals with others, on the conjugate margin of the Ceduna Plateau (Veevers) and Otway Basin (197/B) and the intervening "cold spot" (Langmuir, possibly 91/B), but without success (the proponents were advised by individuals with ODP/TAMU and PCOM connections that the ship was unlikely to go south of Australia - a self-fulfilling prophecy!) As already noted, the S. Tasman Rise proposal (169/C, Hinz) concerns transtensional tectonics related to Australia-Antarctica separation at a large-offset transform.

The Ross Sea proposal (296/C) touches TECP's concern with divergent margins, in respect of the post-Early Jurassic break-up of Gondwanaland, the subject of much controversy in the absence of hard data from drilling. More closely concerned with process, however, is the Cenozoic uplift of the Trans-Antarctic Mts. The timing for this comes only from fission-track data, which are ambiguous and badly in need of lithologic and seismic stratigraphic checks. The importance of this uplift extends into palaeoclimate, since the TAM affect the drainage and stability of the Antarctic ice sheet.

It should be noted also that the deeper objectives of proposal 228/C (E. Weddell Sea margin, Hinz) were not achieved by Leg 113. These concern a seaward-dipping reflector sequence considered analogous to Voring Plateau and similar occurrences, and reflecting the initial opening of the Weddell Sea.

4.3 Convergent Margins.

Proposal 297/C (Antarctic Peninsula) is concerned with ridge crest subduction. Subduction along this margin ceased progressively later northeastward, with a series of ridge crest collisions. The geometry of subduction and collision is very simple, and very well defined. The margin presents a series of snapshots of various times after ridge crest subduction (4, 6.5, 9, 14, 18, 24Ma). The seismic stratigraphy appears to show uplift after collision, followed by slow subsidence (the same subsidence preserves the topset beds of glacio-eustatic sequences of interest to SOHP - see above). Drilling could define the timing and extent of vertical movement, and the nature of hydrothermal circulation resulting from ridge crest subduction, making such events more precisely recognisable in the geologic record of subducting margins in general.

5. LITHP Interest

The LITHP White Paper insists that it has no interest in high latitude drilling. It also claims about 70 percent of the drilling time, with the justification that some TECP and SOHP objectives can be fulfilled at the same time. In the past, LITHP has also been in the habit of arguing for drilling deep into basement at the end of almost any hole drilled for other purposes, forcing in some cases a compromise on those other, primary aims. It will be interesting to see how LITHP reacts, when high latitude drilling next happens.

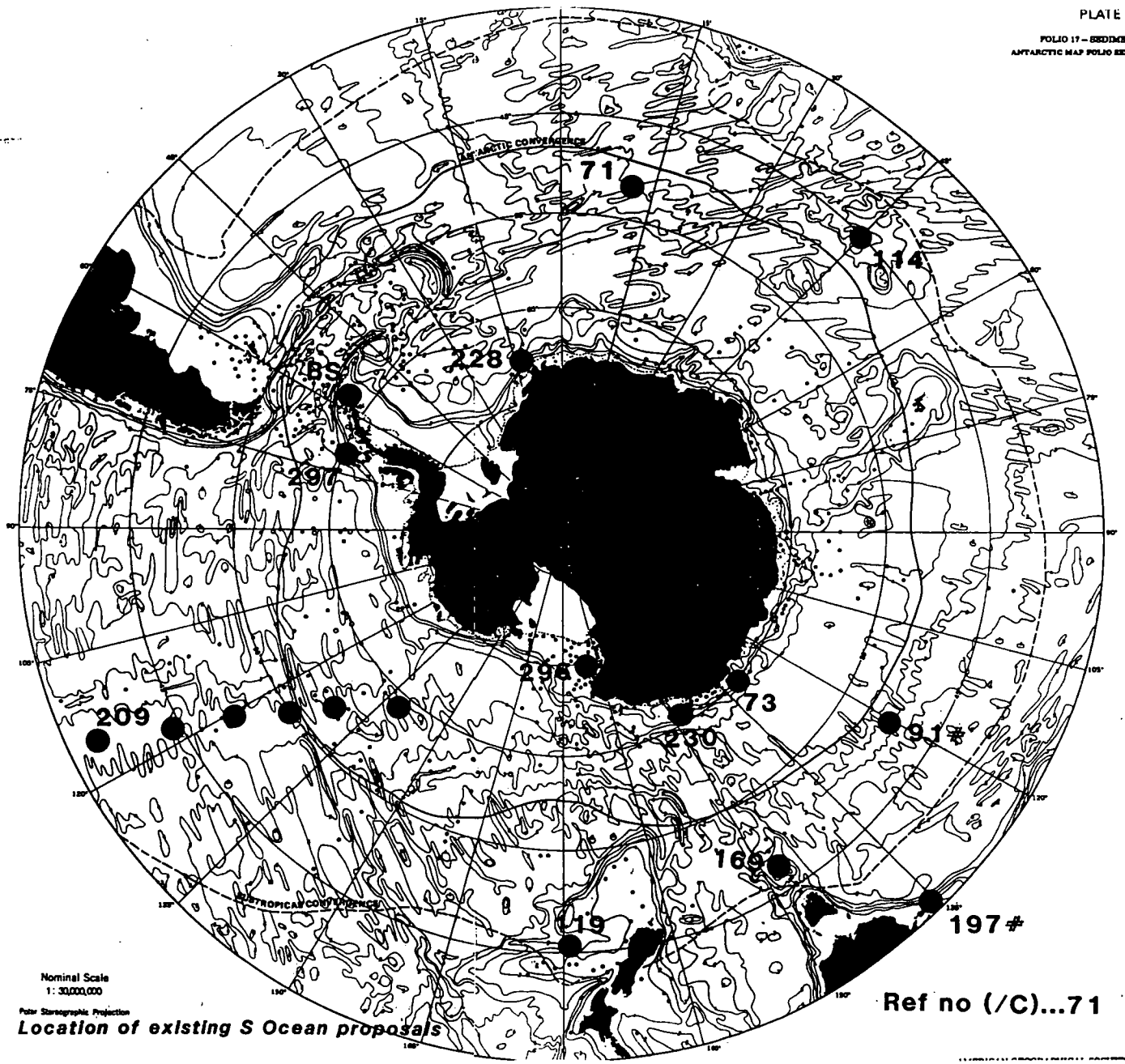
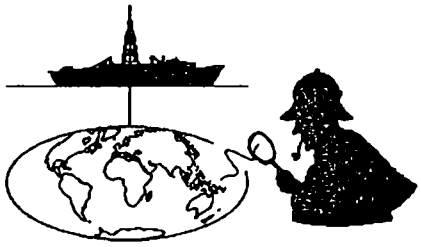


FIGURE 1 Location of existing S Ocean proposals



ODP SITE SURVEY PANEL

ANNUAL REPORT TO PCOM

Scheduling since the previous Annual PCOM meeting:

1. Met twice: March (at Lamont-Doherty) and October (at University College of Swansea).
2. Next meeting: tentatively April 17-19, 1989 (at HIG in Hawaii).

Primary activities since the previous Annual PCOM meeting:

1. SSP is pleased to report that many of the survey deficiencies flagged at its March meeting were attended to promptly by the responsible parties. These included requests concerning:
   - MCS crossing lines at several Japan Sea sites;
   - preparation of structure and isochron maps at NE Australia sites; and
   - detailed velocity analyses at Vanuatu site DEZ2.
2. Scheduled WPAC programs were reviewed at both meetings and are in excellent shape from an SSP perspective. Only two concerns remain:
   - Leg 126 - High heat flow in the vicinity of BON1 prompts SSP to draw attention to the value of an especially careful final site selection; and
   - Leg 127 - Basement at J3b must be imaged better for SSP to approve this site.
3. Other WPAC programs were reviewed and are in good shape. The only SSP concerns are:
   - Lau Basin - Drilling objectives in Lau Basin have been modified recently due to the GLORIA data (seen by SSP for the first time at its October meeting). Along with possible surveying to be conducted in early '89, the Lau data set must be reviewed again at the next SSP meeting; no problems are forseen.
   - Vanuatu - Velocity data and tectonic setting suggest that drilling time estimates and hole conditions at DEZ2 deserve careful study.
   - Geochemical Reference Sites - The data exist for their location, but sites BON8 and MAR5 have not been seen by SSP.
4. Most SSP watchdogs assigned to CEPAC programs delivered their assessments at our October meeting. There is a wide spectrum of readiness across this group of drilling programs. These are gathered into the following categories based on "maturity":
   - **"adult"** *(data package meets SSP standards + is in Data Bank)*
     - no program in this category
   - **"adolescent"** *(data collected + processed, but lacking in some way)*
     - Flexure of the Lithosphere needs pilot study of paleomag resolution
     - N Pacific Neogene (Patton Seamount only) needs crossing SCS
     - Bering Sea (BS1+2 only) not reviewed by SSP
     - Site 504B not reviewed by SSP
     - Loihi Seamount needs side-scan
     - Sedimented Ridges (Middle Valley) needs site specification
   - **"child"** *(data collected but not processed)*
     - Chile Triple Junction
     - Atolls + Guyots
     - N Pacific Neogene (Detroit Seamount only)
   - **"infant"** *(essential data collection scheduled)*
     - Cascadia (Oregon margin only) needs crossing lines

Appendix H

- Old Pacific Crust (PIG1-4+EMB2 only) needs good basement imaging
- Ontong-Java Plateau needs good seismic tie down flank + cores
- Neogene of Equatorial Pacific needs north-south SCS + cores
- EPR Bare Rock needs hi-resolution imagery to augment abundant data

• "**gleam-in-the-eye**" *(essential data inadequate; no cruise is scheduled)*
- Cascadia (Vancouver margin only) needs MCS crossing lines
- Old Pacific Crust (EMB1 only) needs basement to be imaged
- N Pacific Neogene (NW1, 3 + 4) needs acceptable SCS
- Bering Sea (BS3 only) needs additional survey data
- Shatsky Rise needs SCS grid and swath-map or side-scan

Other items of concern to PCOM:

1. **Impact of new thematic structure** - Past success of SSP in identifying and correcting shortfalls of site survey adequacy have been made possible by lead times between initial panel review and actual drilling that are on the order of three years or more. These early reviews have been possible due to drilling prospectuses being prepared by regional panels. SSP emphasizes that the reponsibility of preparing these drilling plans will now fall on the thematic panels or DPG's, and stresses that these gropus continue to supply SSP with prospectuses that are sufficiently mature AND sufficiently early for meaningful evaluation.
2. **Underway geophysics** - The Panel continues to be concerned about underway geophysics aboard the *Resolution.* Of greatest concern is the lack of real-time navigation and smoothed navigation that is prepared in a timely manner. Secondary items relate to plotting geophysical data along track, improving the 3.5 and 12 KHz systems, plus SCS acquisition and processing.
3. **Revised SSP matrix** - Standards for site survey packages were revised at the October meeting, and will be published in the next "Guidelines Issue" of the *JOIDES Journal.*
4. **Data Bank** - The Data Bank ledger has edged into the black, and the operation of this facility continues to be a valuable asset to the effective activities of SSP.

Items specifically requested by PCOM:

1. Personnel
   • notification of changes in panel memberships:
   - John Peirce has rotated off SSP + will be replaced at next meeting by Keith Louden;
   - Fred Duennebier has rotated off JOI/USSAC;
   - Greg Mountain will be a temporary rotator at NSF beginning winter, 1989.

   • request for appointment:
   - that a French panel member be selected.

   • request for liaisons:
   - that a liaison from the newly formed Shipboard Measurements Panel be identified;
   - that the liaison from PPSP that began with our October meeting be continued;
   - that linkage to USSAC be maintained by either a liaison from USSAC, or by a single individual on both SSP and USSAC.
2. Meeting schedule
   • request approval for next meeting in Hawaii April 17-19 to overlap with CEPAC.

Respectfully submitted,

Gregory Mountain, Chairman
November 30, 1988

United States Department of the Interior
GEOLOGICAL SURVEY
BOX 25046 M.S._____
DENVER FEDERAL CENTER
DENVER, COLORADO 80225-0046

IN REPLY REFER TO:

Office of Energy and Marine Geology
Branch of Petroleum Geology

November 22, 1988

Memorandum

To: Ralph Moberly, PCOM Chairman

From: Mahlon Ball, PPSP Chairman

Subject: Annual Report of PPSP to PCOM

PPSP, in its role of providing independent advice to PCOM and ODP concerning safety and pollution hazards, met 5 times since our last annual report to PCOM. These meetings involved proposed drill sites for Leg 121: Broken Ridge and Ninetyeast Ridge; Leg 122: Exmouth Plateau; Leg 123: Argo Abyssal Plain and Exmouth Plateau; Leg 124: Southeast Asian Basins; Leg 124E: Engineering I; Leg 125: Bonins and Marianas; Leg 126: Bonin II; and Leg 129: Nankai Trough. Forty-five sites were approved and 3 were disapproved. Safety previews were conducted for the Japan Sea, Nankai Trough and the Northeast Australian Margin.

Over the past year, the quality of presentations for safety reviews has generally been good with respect to both submission of data sufficiently in advance of PPSP meetings to allow an adequate study period by panel members and completeness of the data submitted. The panel's revised guidelines for conduct of safety reviews should be available soon for future chief scientists. The panel has established a liaison with the site survey panel and will have one of its members attending SSP meetings. We should be able to further assist chief scientists in their preparation for safety reviews through out liaison with SSP.

PPSP has requested that sedimentation rates be included as an item on future Joides Safety Review Check Sheets. Where sedimentation rates exceed $40m/10^6$ yrs. microbial methane is common in marine sediments. Rapid sedimentation rates result in the elimination of dissolved oxygen and sulfate in sediment pore water and facilitate production of methane by fermentation of organic matter. Thus, sedimentation rates are to some degree a measure of the likelihood of encountering biogenic gas.

With the help of ODP, PPSP continues to upgrade the data base of C_1/C_2 ratio versus subsurface temperatures. Our interest in doing this is to establish what constitutes a "normal" background ratio over a wider temperature range.

Appendix I

Mahlon Ball

INFORMATION HANDLING PANEL REPORT - 1988

The minutes from the January and September Information Handling Panel meetings record progress at ODP in publication production, data collection, software and hardware development, and curation of samples. They also indicate recommendations by the Panel regarding specific problems. Actions taken on items in which the scientific community and PCOM have expressed keen interest are presented in this report.

PUBLICATIONS: As recommended by IHP, ODP has added a "copy edit step" to the manuscript flow for manuscripts to be printed in the Scientific Results Volume. In addition, data papers will be reviewed by at least one expert in the measurement technique used in the data collection. This review will assure that the methods used are clearly and completely presented.

Shipboard and shore-based scientists who do not fulfill their obligations the Project (e. g. do not provide manuscripts on the results of their studies) are being sent a letter from the PCOM Chair. This letter details our perception of their failure to meet their obligations and invites a response explaining any mitigating circumstances or misunderstandings. Copies of this correspondense will also be sent to the appropriate secretariat and kept on file at the ODP office of scientific staffing. If such "non-performers" are recommended for ODP participation in the future, their record of past performance will be taken into consideration when deciding wether or not to invite them to take part in forthcoming legs of the ODP.

COMPUTER SERVICES: Through the efforts of ODP, The Apple Computer Company has decided to donate four McIntoshes and a laser printer for shipboard use. This request to Apple was made in response to numerous requests for McIntosh hardware from shipboard scientists. The search for better, more broadly useful graphics software goes on.

CURATION: Core photographs of the ODP collection will be made available on video discs at a recommended cost of $50 per disc. The first disc is nearly ready and will contain color photos for all DSDP legs plus core photos of ODP legs up through 121. It is hoped that a complete set of core photographs will be made available at all the Micropaleontological Reference Centers (MRC).

The eighth and final set of micropaleontological reference samples has been sent to the Smithsonian Institution in Washington D.C. A brochure describing the purpose, facilities and locations of the MRC's has been produced by ODP.

DATA BASE: USSAC and the U.S. National Geophysical Data Center

are producing a CD-ROM which contains the entire DSDP data base and seperate software which allows easy search and selection of items in the data base. The IHP applaudes this action and suggests that the ODP data base should be made available in a similar manner. Data is being produced at such a rate that issuance once every two years seems appropriate.

ODP is obtaining a program that will allow direct shipboard entry of micropaleontologic data. Once entered, these data can be easily corrected and updated by the micropaleontologists and then fed directly to the ODP data base. The "bug" data is one of the most crtical elements in the ODP data base; but because of its size and the plethora of oddly spelled latin names, data entry has traditionally been a daunting task. This software should both speed up entry and reduce the potential for error in the data base.

The most commonly requested data comes from the visual core description data base; yet this remains one of the most difficult pieces of the data base to enter, requiring a great deal of both manpower and time. Delays in entering the data mean that it is not available to the scientific community as soon as it should be. IHP has recommended that we develop a means of onboard computer entry of the Visual Core Description and seeks help from the sediment panels in designing such an onboard entry system. Such a system has been designed for hard rock cores and will be tested soon.

T. C. Moore, Jr.
Chairman, IHP

JOIDES Panel Chairmen Meeting
Annual Report and Minutes of Meeting
27 November 1988
Rosentiel School, Miami
9:20 a.m. - 5:00 p.m.

Present:

R. Detrick (LITHP), Chairman
J. Austin (ARP)
M. Ball (PPSP)
I. Dalziel (TECP)
L. Mayer (SOHP)
T. Moore (IHP)
K. Moran (SMP)
G. Mountain (SSP)
D. Rea (CEPAC)
R. Schlich (IOP)
N. Shackleton (OHP)
C. Sparks (TEDCOM)
E. Suess (SGPP)
B. Taylor (WPAC)

Guests:

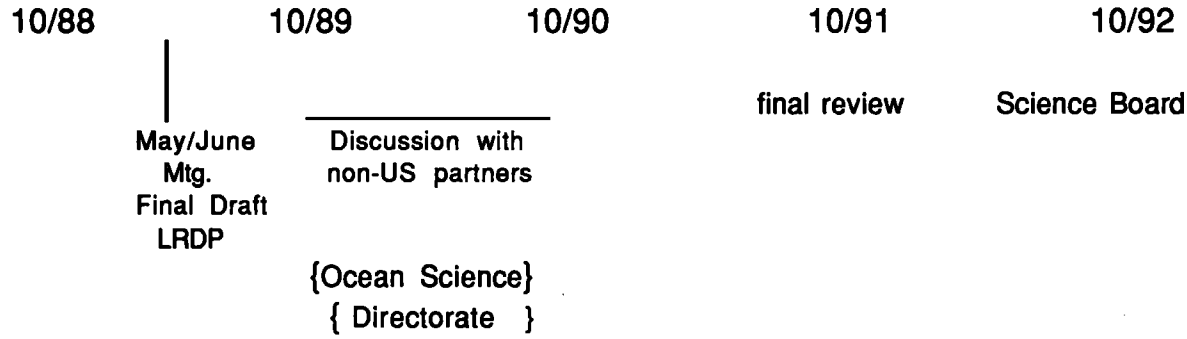
B. Malfait (NSF)
N. Pisias (PCOM)
R. Moberly (PCOM)
H. Iwamura (JOIDES)

The proposed agenda was adopted, with the addition of Item 6, Publications.

1. Long-Range Drilling Plan (LRDP)

N. Pisias distributed draft copies of a document that will be the proposal for 10 years of drilling beyond the next 4 years. He commenced his presentation by showing a time line of review and decision points between October 1988 and October 1992.

Appendix K



Thus, the LRDP will be the selling document for ODP in the US and partner nations. There will be other strong science programs in competition with ODP. If the LRDP is unsuccessful, the final year (FY 1993) of the existing program will be a phasing-out of ODP.

The LRDP contains 16 scientific themes, with their implementation plan based on three phases. There will be references to the attached COSOD I and II papers and the new thematic white papers. There is no strong need for an alternate platform in the next 10 years. There is no need for a riser at least for the next few years.

Discussion centered on the concepts of focusing and establishing priorities among the 16 themes. One view was that the main themes and objectives be few, focused and new, and that these be of highest priority. A small amount of drilling time would be available for the rest. An example of 5 such themes was presented.

An objection was that if many of the objectives identified in COSOD and white papers were removed, much of the scientific community might lose interest in supporting such a program. It was agreed, however, that the 16 should be focused into a few broad themes, and that priorities would be related to the constraint that engineering places on the 16. There shall be no attempt to set priorities among the few first-order themes:

1. Structure and composition of oceanic crust and mantle.
2. Causes and effects of oceanic climate and variability.
3. Fluid flow circulation in the lithosphere.
4. Dynamics, kinematic, and deformation of the lithosphere.

Each of these four should have a newly written introduction.

The tables of the LRDP will be modified to account for these 4 topics, and text and implementation plan will include what is required for pre-drilling work (mainly site surveys) and post-drilling work. The number of legs should be approximately 50% more than can be drilled in 10 years, to ensure strong competition among the proposals for legs.

2. New Panel Advisory Structure

a. Communications

After a general discussion of the usefulness of liaison in communications, it was agreed that liaison between thematic panels be "double" and clearly identified: TECP to LITHP and SGPP (and ad hoc to OHP); LITHP to TECP and SGPP; SGPP to all three; and OHP to SGPP (and ad hoc to TECP). Liaisons must be replaced at PCOM's earliest opportunity. Regular scheduling of meetings and prompt circulation of minutes will assist communications.

Liaison between thematic and service panels or between service panels may be mainly ad hoc. Probably no formal liaison is needed between a thematic panel and a detailed planning group (DPG), as many DPG's are based on thematic requests and probably will have thematic panel members on the DPG.

b. Detailed Planning Groups

A general discussion of the DPG concept followed. DPG's have a regional aspect, an ad-hoc nature and short life, and proponents very likely will be members. Not all proposals will lead to a DPG. DPG recommendations normally will go to the appropriate thematic panels for their review and modification before transmittal to PCOM.

c. Drilling Proposals

The three-phase history of proposals was discussed briefly:

(1) An advocate decides to submit a drilling proposal. The proposal is reviewed by all thematic panels.

(2) Thematic panels decide which proposals have high thematic objectives. The advocates have the opportunity

to "mature" their proposal with the assistance from the advisory structure, possibly including a DPG.

(3) PCOM decides which proposals are included in a year's Drilling Plan.

3. WPAC Planning Issues

The principal discussion introduced by Brian Taylor revolved around the perceived intrusion of political affairs into the science planning structure, which may affect WPAC and CEPAC planning.

The Panel Chairman unanimously adopted the following resolution:

"The Panel Chairmen agreed that the planning of the ODP, and therefore the movement of the JOIDES Resolution, should be driven by the science that is proposed. Every effort should be made to drill the sites that address the most important scientific problems in the most appropriate locations, without regard to parochial or political considerations that impose an arbitrary time frame or push to have the ship visit a particular area."

4. Second CEPAC Prospectus

David Rea emphasized the need for liaison to thematic panels, and the need for engineering legs to test engineering developments appropriate for CEPAC drilling in high-temperature environments, chert-chalk sequences, reefal limestone, and on brittle, fractural crust.

5. Engineering Development Needs and Priorities

Much of future drilling depends on engineering development, and the panel chairmen were concerned that communications were not very clear among TAMU, PCOM, and the Panels. PCOM must keep better communications with TAMU engineers regarding developmental needs and their phasing. Perhaps once a year a panel should invite a TAMU engineer to its meeting to ensure that the scientific objective is understood. Occasionally, a JOIDES scientist should attend TEDCOM. The probable incompatibility of some advanced logging tools (geochemical, bore-hole televiewer) with the slim-hole, diamond-drilling method was given as a case in point where the essential information was not in hand at the time an annual Program Plan was

written. The panel chairmen emphasize the need for continual feedback from Engineering in order for PCOM to make its next round of decisions.

6. Publications

Ted Moore led the initial response to PCOM's request for ways to promote thematic publications and reduce the delay of Part A and Part B publications. The question for Part A, where the most time-consuming part is agreement on a stratigraphic zonections of the cores, will be passed to OHP. The question of Part B may be whether or not Part B should be abolished and replaced by sets of collected reprints.

The meeting adjourned so that a subcommittee could draft introductory paragraphs to the new sections of the LRPD.

DIAMOND CORING SYSTEM (DCS) DESCRIPTION
AND
ENGINEERING LEG (124E) PRELIMINARY TEST PLAN

DATE/TIME: 1200 HRS October 19, 1988 PLACE: ODP Science Lounge

I. DEVELOPMENT OVERVIEW

A. Project Engineer/Industry Participants

1. Steve Howard
2. Tonto Drilling/Westech Corporation
3. DRECO, Inc.
4. AMOCO Production Research
5. IKU/Farmand Survey Co. (Bucentaur)

B. DCS Operating Depth/Development Schedule

L124E (test)	2000 meters
Within 1 year	4000 meters
Within 2 years	5500 meters

C. Primary reasons for development:

1. Zero age crustal drilling - Leg 106/109 etc. (i.e. ridge crest spreading centers)
2. Interbedded formation drilling (particularly chalk/chert and sediment/volcanics)
3. Unconsolidated formation drilling (turbidites,decollement overthrust zones etc.)

D. Anticipated advantages of system:

A proven, high speed, narrow kerf, low bit weight diamond coring system which drills small hole diameters with low flow rates and is expected to yield:

1. More stable hole conditions
2. Higher recovery (3-slides)
3. Higher ROP

E. Primary disadvantage:

Hole size too small for advanced logging tools and special tools. Will need to develop state-of-the-art slimhole logging tools and/or perfect reaming operations.

Appendix L

II. DESIGN OVERVIEW

A. The DCS system consists of 5 primary components:

1. Mining Top Drive (Tonto)
2. Secondary Heave Compensator (Westech) (automatic feed system)
3. Core Drill Platform (Dreco)
4. Drill (Rod) String (Hydril)
5. Wireline Core Barrels/Bits (Tonto/various) (slide/overhead)

B. System Specifications:

Hole Size/Bit OD:	4.00 inches (nominal)
Core Size/Bit ID:	2.40 inches (nominal)
Core length:	10.00 feet
Core Barrel OD:	2.875
Rotary Speed:	400-600 RPM
Rotary Torque:	1,500 ft-lbs
Typical WOB:	4,000-12,000 lbs +/- 1,000 lbs
ODP Drill Pipe:	5 or 5 1/2 inch S-140
DCS Drill Rod:	Hydril Series 500 Tubing (Type 501)
	3-1/2, 9.3 lb/ft grade N-80
	EUE integral tubing connections
	Tool Joints: 3.868 inches
	Pipe body: 3.500 inches
	I.D.: 2.942 inches
	Maximum Length: 12,000 feet
Core Bits:	Surface Set/Impregnated Diamond
Flow rates:	10-20 GPM (typically 12-15)

C. Basic System Operation

1. Platform hung from 471 Heave Compensator
2. DCS Top Drive/Drill Rod hung from secondary HC
3. Mining drill rod w/Dia bit deployed thru ODP DP
4. Wireline coring through drill rod
5. ODP pipe to be hung from elevators or Varco top drive below platform
6. Drill pipe as riser/returns to ~~surface~~ SEAFLOOR (slide/overhead)

III. DESIGN DETAILS

A. Mining Top Drive and ancillary equipment:

Hydraulic Top Drive (Universal Drillers, Australia)
200 HP power pack with ELECTRIC MOTOR prime mover
Wireline winch 4,000 meter capacity
Control Console shared with secondary HC system

B. Secondary Heave Compensator/Auto Feed

Provides for 10 feet of penetration with +/- 18" heave
Automatic feed system IBM PC controlled to sense bottom and control WOB to +/- 1,000 lbs.

C. Core Drill Platform

Footprint 12'-6" by 7'-6"
Platform Height approx. 7'6"
Mast Height approx. 32'
Work surface hydraulically shock mounted

IV. SHORE TEST DETAILS

A. Drill Rod Test - achieved 2,000,000 million fatigue cycles, without failure, while under 30,000 lb tensile load and rotating at 550 rpm inside 5 inch ODP drill pipe bent to 550 ft bending radius every 10 seconds.
(completed)

B. MAST structurally tested to 2,000,000 pounds
Platform shock cylinders dynamically tested.
(completed)

C. Platform mounted top drive and secondary heave compensation/feed system test.
(in progress ?)

V. MANILA PORT CALL

A. Assemble and handle platform (dry run to rig floor)
B. Load and secure 20' container of DCS c'bbl/bit hdwr
C. Review handling/operating procedures

VI. TEST LOCATION/DETAILS

Leg 124E Site ENG-1

Seamount in Luzon Strait - North of Philippine Islands
Water Depth 1600 meters, sediment cover 200 meters.
(1-slide/overhead)

Intentions are to drill up to 200 meters into basement.

TRANSIT TIME: 1.8 days ON-SITE TIME: 15.5 days

Staffing:
ODP Project Engineer
Tonto Drilling Engineering Manager
Tonto Diamond Driller
Westech Design Engineer

DATE NOV. 1988

DEVELOPMENT ENGINEERING 'PROJECT' SCHEDULE

YEAR	1988						1989										1990								
TENTATIVE LEG NO.	121	122	$	123	124	124E	125	126	127	128	$	D	129	129E	130	131	132	133	$	134	135	136	137		
OCEAN	INDIAN OCEAN						WESTERN PACIFIC									TENTATIVE									
OPERATING AREA	BRENKE/SCOTT KNOLL	EXMOUTH PLATEAU	EST./ACTUAL FY 1989	ARGO ABYSSAL PLAIN	BANDA-SULU S. CHINA SEA	ENGINEERING LEG	BONINS HARTAWAS	BONINS	JAPAN SEA I	JAPAN SEA II	EST. REQ. FY 1990	DRY DOCK	HAWKAI TROUGH	ENGINEERING LEG	GEOCHEM REF HOLES	SOUTH CHINA SEA MARGIN	NE AUSTRALIA MARGIN	VANUATU	EST. REQ. FY 1991	LAU TONGA BASIN					
NAVI–DRILL CORE BARREL	T		100K / 50K		○	T	✕	○	○	○	200K		✕	T	✕	○	○	✕	100K	✕					
DIAMOND CORING SYSTEM (TOP DRIVE)			1.6M / 200K			T1					500K			T2					500K						
DIAMOND CORING SYSTEM (DOWNHOLE TURBINE/THRUSTER)			100K / 0								200K								100K						
ADVANCED XCB SYSTEM	T	○	25K / 100K	○	○	T	○	▭	○	○	50K		✕		✕	○	○	○	0	○					
VIBRA/PERCUSSION CORER			100K / 0		✕		○	○	○	○	100K		✕	T?	✕	○	○	○	100K	○					
PRESSURE CORE SAMPLER			100K / 50K		○	T	○	✕	✕	○	100K		✕	T	○	○	○		50K						
HIGH TEMPERATURE CORING														T						○					
HARD ROCK BIT DEVELOPMENT														T	✕	○	○								
MISC. CORING IMPROVEMENTS			34K																						
			2.0M / 389K																						
DEVELOPMENT ENGR. ASSIGNED TO LEG	DPH			MAS		(ALL)	TLP	DPH						(ALL)											

○ SCIENTIFICALLY DESIRABLE

T DEVELOPMENT TEST

▭ ANTICIPATED OPERATIONAL

✕ SCIENTIFICALLY ESSENTIAL

DCS
1 – 1800m TD, 100–200 BSF
2 – 4000m TD, 200–500 BSF
3 – 5500m TD, 500+ BSF

Appendix M

DATE NOV. 1988

DEVELOPMENT ENGINEERING 'GENERIC' TECHNOLOGY REQUIREMENTS

YEAR	1988						1989								1990									1991	
TENTATIVE LEG NO.	121	122	$	123	124	124E	125	126	127	128	$	D	129	129E	130	131	132	133	$	134	135	136	137
OCEAN	INDIAN OCEAN						WESTERN PACIFIC								TENTATIVE										
OPERATING AREA	BROKEN/NE RIDGE	EXMOUTH PLATEAU	FY 1989	ANGE ABYSSAL PLAIN	BANDA-SULU & CHINA SEA	ENGINEERING LEG	BONINS (NANTAIWAS)	BONINS	JAPAN SEA I	JAPAN SEA II	FY 1990	DRY DOCK	NANKAI TROUGH	ENGINEERING LEG	GEOCHEM REF SITES	SOUTH CHINA SEA MARGIN	NE AUSTRALIA MARGIN	VANUATU	FY 1991	LAU TONGA BASIN			
FRACTURED CRUSTAL CORING						T								T									
INTERBEDDED CHERT/CHALK (≤6")	Ⓣ				⊠	T		⊠	⊠					T	⊠	○	○						
INTERBEDDED SEDIMENT / VOLCANICS								⊠						T				⊠					
UNCONSOLIDATED FORMATIONS (LOOSE SAND / TURBIDITES, ETC.)	Ⓣ				⊠		○	○	○	○			⊠	T		○	○	○		○			
DEEP CRUSTAL PENETRATION (1500 – 3000 m)						T								T									
DEEP SEDIMENTARY PENETRATION (1000 – 3000 m)		○		○	⊠	T		○		⊠			⊠	T		⊠		○					
HIGH TEMPERATURE CORING(≤400°C)														T						○			
MASSIVE CHERT (≥6")														T	⊠	○	○						
PRESSURE CORE SAMPLING (PHASE I)					○	T	○	⊠	⊠	○			⊠	T	○	○	○						
BARE ROCK SPUD														T									
DEVELOPMENT ENGR. ASSIGNED TO LEG	DPH			MAS		(ALL)	TLP	DPH					HM	(ALL)									

○ SCIENTIFICALLY DESIRABLE

T DEVELOPMENT TEST

▭ ANTICIPATED OPERATIONAL

⊠ SCIENTIFICALLY ESSENTIAL

DATE NOV. 1988

DEVELOPMENT ENGINEERING
'3RD PARTY DEVELOPMENT' SCHEDULE

YEAR	1988		$ FY 89				1989				$ FY 90			1990			$ FY 91		1991	
TENTATIVE LEG NO.	121	122	123	124	124E	125	126	127	128	D	129	129E	130	131	132	133	134	135	136	137
OCEAN	INDIAN OCEAN						WESTERN PACIFIC							TENTATIVE						
OPERATING AREA	BROKEN/SW E RIDGE	EXMOUTH PLATEAU	ARGO ABYSSAL PLAIN	BANDA-SULU S. CHINA SEA	ENGINEERING LEG	BONINS MARIANAS	BONINS	JAPAN SEA I	JAPAN SEA II	DRY DOCK	NANKAI TROUGH	ENGINEERING LEG	GEOTECH REF HOLES	SOUTH CHINA SEA MARGIN	NE AUSTRALIA MARGIN	VANUATU	LAU TONGA BASIN			
APC PORE WATER SAMPLER (ROSS BARNES) (?)								X			X									
GEOPROPS PROBE (TAYLOR/KARIG)								X			X									
PRESSURE METER – PHASE I (KATE MORAN – BEDFORD INSTITUTE)								X			X									
PRESSURE METER – PHASE II (KATE MORAN – BEDFORD INSTITUTE)												T								
JAPANESE-INSTRUMENT EMPLACEMENT-1 (TEMPERATURE)											X									
JAPANESE-INSTRUMENT EMPLACEMENT-2 (SEISMOMETER)								X												
TAM STRADDLE PACKER (KIER BECKER)			X			P		X	P		P					P	O			
TAM DRILLING PACKER (ODP)			T			P		P	P		X					P				
DEVELOPMENT ENGR. ASSIGNED TO LEG	DPH		MAS		(ALL)	TLP	DPH					(ALL)								

O SCIENTIFICALLY DESIRABLE

T DEVELOPMENT TEST

ANTICIPATED OPERATIONAL

X SCIENTIFICALLY ESSENTIAL

P DMP RECOMMENDATION

SCIENTIFIC OBJECTIVES

- EVOLUTION OF GLOBAL OCEAN ENVIRONMENTS
  - geosciences,
  - physics and chemistry
  - biology

- STRUCTURE AND DYNAMICS OF THE OCEANIC LITHOSPHERE

- SPECIFIC APPLICATIONS
  - Waste Disposal Program (geotechnical/impact studies)
  - Mn nodules (geotechnical/impact studies)
  - Slope stability studies
  - Monitoring and prediction of earthquakes, volcanic eruptions, slope mass wasting
  - Intervention on deep sea wrecks.

Appendix N

SELECTION OF OBJECTIVES FROM COSOD II

- **Global environment change:**
  - **global APC transects (neogene and part of paleogene)**
- **Interactions Crust-Mantle:**
  - **global geochemical mapping of upper portion of oceanic crust**
- **Fluid circulation and global geochemical budgets:**
  - **long-term observatories**
  - **fluid sampling**
- **Strain and Stress in the lithosphere:**
  - **sismological and geophysical long-term observatories**
  - **downhole measurements**
- **Evolution of oceanic organisms** **(see WG 1)**

TECHNICAL APPROACH

- **Coring:**
  - APC coring for unconsolidated sediments
  - turbocoring for hard rock

- **Downhole experiments:**
  - logging (comparable to present ODP program)
  - fluid sampling
  - long-term downhole observatories

- **Sea floor experiments:**
  - installation, activation, control, recuperation of deep sea observatories (geophysics, geochemistry, sediment traps, pressure, biology)
  - large volume sampling of sediment-water interface
  - precise control and positioning of heavy tools that cannot be handled by submersibles
  - video slow speed seafloor surveys

THE SHIP

- **LOA:** 111 meters
- **Beam:** 21,5 meters
- **Total Displacement:** 7.850 tons
  useful load 3.300 tons
- **Ice capability:** class II
- **Station keeping capability:** wind = 34-40 knots continuous
  45 knots 1 minute gusts
  current = 2 knots
  swell = irregular swell : ITTC spectrum
  of 3 meters of significant height
- **Autonomy:** 70 days at sea (50 days ops)
- **Speed in transit:** 14 knots
- **Dynamic positioning:** max capability 100 knots, wind ahead
  35-40 knots wind aheam
- **Derrick:** Steel with central moon pool heave compensation
- **Pipe rack capability:** 6.600 meters mostly aluminum + drill collars
- **Laboratory space:** 600 m^2 + containers
- **Logging winches with co-ax and/or optic fiber cables**
- **Core storage :** approx. 370 m^3
- **Crew:**

officers and seamen	25
coring technicians	15
scientists and marine techs	25

SPECIAL EQUIPMENT

- Mud pumps and mud room (possibly also cement)
  (for hole plugging and logging)
- Mud storage = 370 m3 of bentonitic or baryte powder
- Re-entry system (cones, video cameras)
- Heave compensator
- Cranes one 40 ton crane
  one 20 ton crane
- A-frame 20 ton, equipped with a winch installed on aft deck
- Multibeam echo-sounder
- High resolution digitized seismic profiling system
- Magnetometer
- Near floor monitoring equipment (video, geophysics, geochemistry, fluid sampling)
- Removable horn and moon pool equipment (in order to launch 4x4x3 m tools through the moon pool)
- Wire-line heave comp. system for co-axial and/or optical fiber cables.

ON BOARD FACILITIES

- Lab surface 600 m2

- Science headquarters

- Geophysical laboratory

- Photo video and core description laboratory

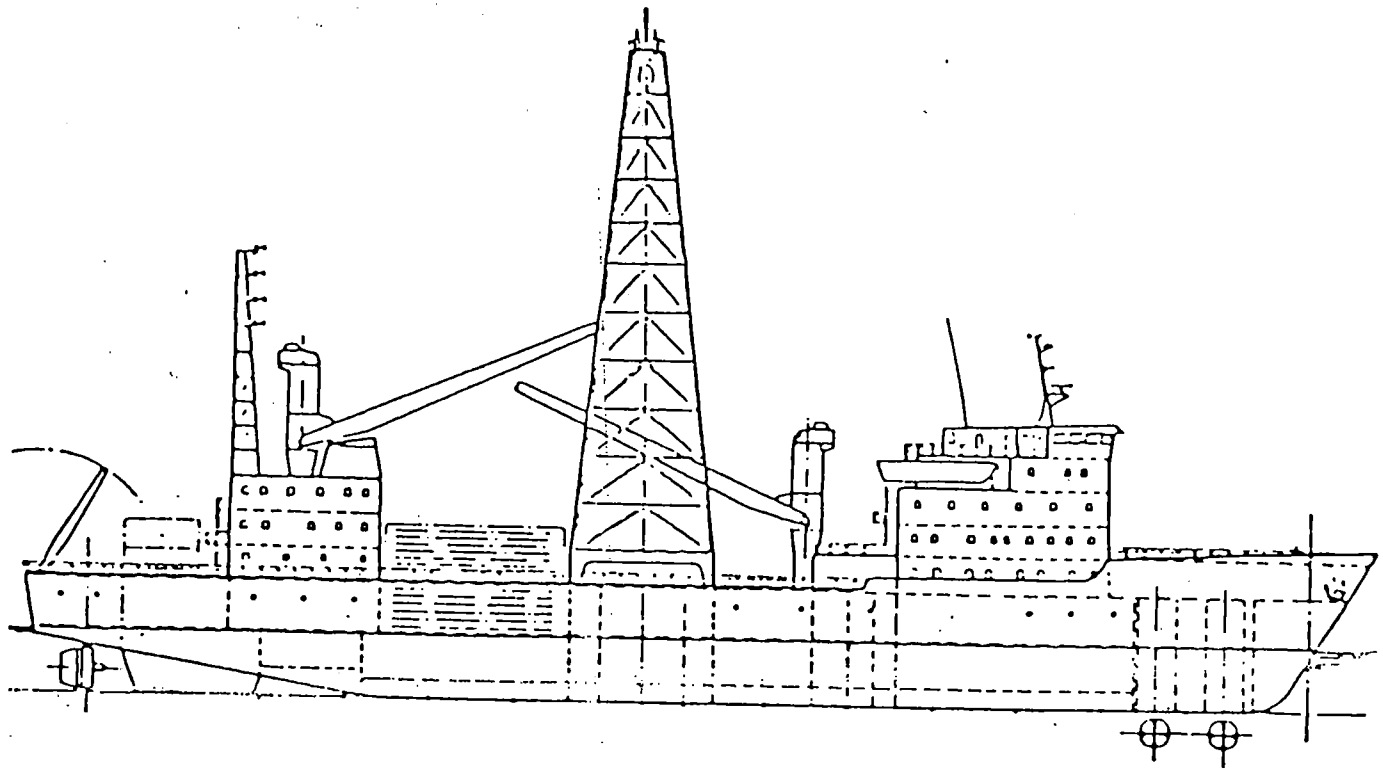
- Specialized labs

  sedimentology,
  paleontology,
  physics chemistry,
  hard rock petrology

- Library

- Computer room

  Computer system to consist of:
  . central unit
  . communication system (via satellite)
  . general distribution system (all over the ship).



TENTATIVE SCHEDULE

		deadlines
Consultation with european partners		1 July 1989
Final plans and preparation of RFPs		31 Dec 1989
Final decision for partnerships		1 Apr 1990
RFPs sent out		1 Apr 1990
Selection of contractors and subcontractors		1 Sep 1990
Contracts awarded		1 Jan 1991
Construction	from	1 Jan 1991
	through	1 Jan 1993
Operations begin		1 Jan 1993

COST ESTIMATES

Ship	**344 MF**	**57.8 M$**
Drilling equipment	**71 MF**	**11.8 M$**
Science equipment **(not including logging and multibeam)**	**20 MF**	**3.3 M$**
Computer systems **(including positioning)**	**15 MF**	**2.5 M$**
Total	**450 MF**	**75.4 M$**

Operation cost (for 200 days at sea)

annual cost	**40 MF**	**6.6 M$**
daily cost	**0.2 MF**	**33.000 $**

MAJOR LEG 122 OBJECTIVES

1. Retrieve older Mesozoic record at Wombat Plateau
   a) pre- & syn-rift history, rift-drift transition
   b) paleogeography, paleoclimate & paleoceanography
   c) evolution of facies and faunas at S (Gondwanan) margin of SE Tethys

2. Ground truthing of seismic sequences and unconformities

3. Study early Cretaceous to Cenozoic post-breakup development (clastic-dominated "juvenile" → carbonate-dominated "mature" ocean stage).

   Classic, very old and complete sediment-starved passive margin section.

4. Establish and/or refine early Mesozoic and Cretaceous/Paleogene magneto-bio-chronostratigraphy

5. Study depositional sequences (sequence stratigraphic analysis and geohistory interpretation).

   Separate effects of regional tectonics, subsidence, and varying sediment input from eustatic signal.

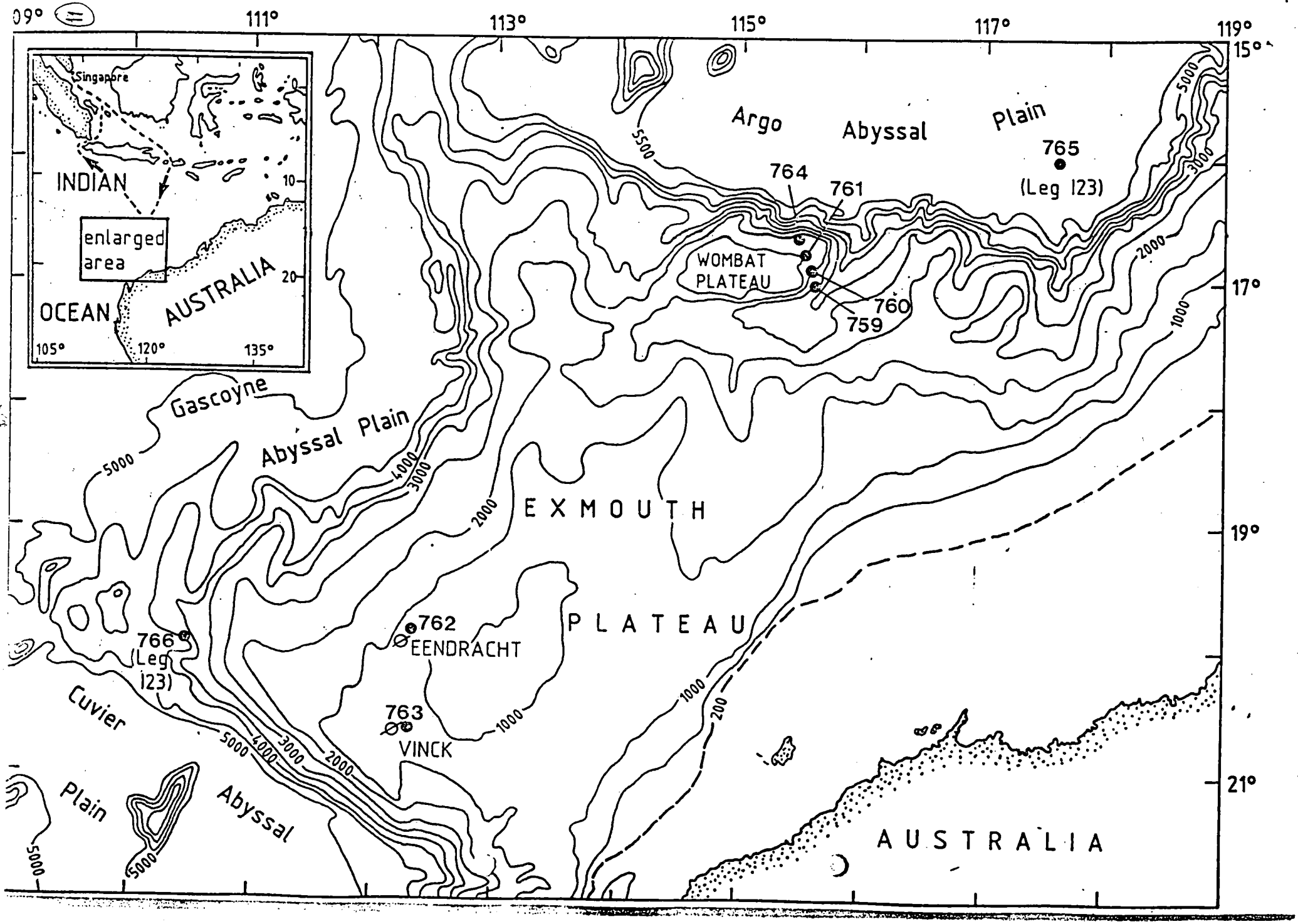
   Test sequence-stratigraphic models and eustatic cycle chart.

   Correlation with extensive existing seismic and industry well data.

6. Mid-Cretaceous anoxic sedimentation

7. Cretaceous/Tertiary boundary event

Appendix O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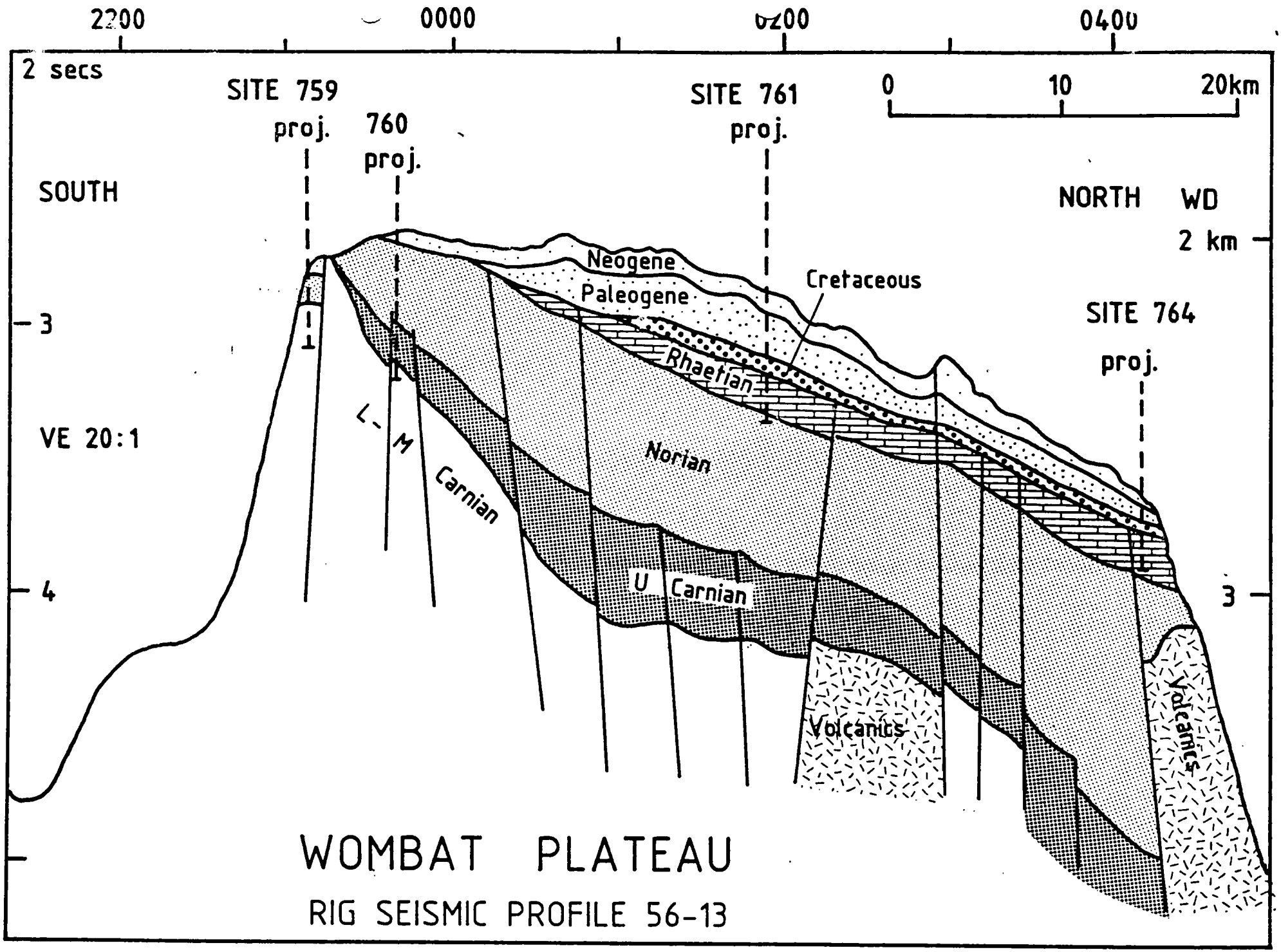
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Volcanics
WOMBAT PLATEAU
RIG SEISMIC PROFILE 56-13

LEG 122 HIGHLIGHTS (EXMOUTH PLATEAU)

6 Sites (max. 1037 m TD): 3.7 km cored (ca. 1.1 km Triassic, ca. 1.3 km Cretaceous), 66% recovery

1. Rifting from (?Late) Permian to (?early) Jurassic.

   Early block-faulting event between Carnian/Norian.

   Oldest sediments so far recovered by ODP (230 Ma). Oldest (Carnian-Rhaetian) calcareous nannofossils.

2. First Tethyan shallow-water carbonates in early-middle Carnian. Alternation with marginal-marine/fluviodeltaic clastics (Carnian-Norian). Active lobe migrations modify stacking patterns with carbonates.

3. Rhaetian carbonate platform buildup (reefs and perireefal carbonates). Excellent correlation with other Tethyan facies and faunas (Alps etc).

4. Post-Rhaetian (?Liassic) major rift phase (block-faulting). Uplift and rift flank tilting of Wombat Plateau horst, subaerial exposure and erosion during Jurassic.

5. Breakup of Wombat Plateau/Argo Abyssal Plain: 140-145 Ma (latest Jurassic/Berriasian): Site 765 (Leg 123). India migrating northward, starting destruction of Tethys.

6. Berriasian to Barremian (Valanginian) clastic juvenile ocean facies at Wombat Plateau (belemnite sands etc.), overlain by Aptian-Albian calcisphere nanno chalk w. sepiolite layers (?evaporitic)

7. At Central Exmouth Plateau prograding syn-rift distal shelf margin sequence (deeper-marine clastic wedge) in Berriasian to Valanginian

8. Breakup of western and southern Exmouth Plateau margins in Hauterivian (erosional unconformity at Site 763 between Valanginian and early Aptian). According to Site 766 (Leg 123) breakup at 134 Ma (late Valanginian).

9. Early Aptian transgression (organic-rich shale) at central Exmouth Plateau.

10. Hemipelagic Albian-Cenomanian "juvenile" ocean stage sediments.

11. Cenomanian-Turonian boundary event (black shale, 15% Corg).

12. Turonian and later: fully marine mature ocean stage.

13. Documentation of important sequence-stratigraphic boundaries (due to eustatic sea level fluctuations?) between middle and late Carnian, at Norian/Rhaetian boundary, in the latest Rhaetian, Berriasian/Valanginian, etc in an area of excellent seismic stratigraphic and commercial well control.

14. K/T boundary interval apparently complete (Sites 761, 762).

15. Expanded Paleocene sequence (Site 761).

16 All six sites logged (incl. SES) with excellent results.

ESCO-secretariat
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Telex: 79367 escon n
Telefax: 472 454215

23.11.88

TO : DISTRIBUTION

FROM : OLAV ELDHOLM

SUBJECT : JOIDES PLANNING COMMITTEE MEETING
May 2-4, 1989

PLACE : Conference Room, Voksenåsen Hotel.

HOTEL : Voksenåsen Hotel A/S
Ullvn. 4, Oslo

Tlf. 02-14 30 90
Telex 77450 SARA N

Room and board NOK 920,- per night.
(This is cheap for Norway!)

GROUND TRANSP. : Taxi from Fornebu Airport to Voksenåsen.

Note: All rooms have been reserved for late arrival on May 1st.

Appendix P

INSTITUT FRANCAIS DU PETROLE

Direction de recherche
"Exploitation en Mer"

76.20 ChS/JN N°70

5 October 1988

SIXTH MEETING OF THE JOIDES
TECHNOLOGY AND ENGINEERING DEVELOPMENT COMMITTEE (TEDCOM)

Windisheschenbach, Bavaria, Germany
28 September 1988

C. Sparks

Appendix Q

MEETING SUMMARY

The TEDCOM meeting was held on 28 September at the KTB site in Bavaria following the workshop on "Continental and Ocean Drilling and Coring in Crystalline Rock". The workshop, which included important presentations from I.K.U., Farmand Survey, Diamant Boart and the British Geological Survey as well as KTB and ODP is the subject of separate proceedings. To facilitate future contact between TEDCOM/ODP members and attendees at the workshop, copies of business cards of all participants have been included at the end of this report. Key participants at the workshop were invited to stay on and attend the TEDCOM meeting.

The TEDCOM meeting was spent principally discussing the objectives of the Engineering Leg (124E) and ways of solving or improving on existing technological problems. Based on their experience, TEDCOM members had important comments to make on many problems of concern, such as : ways of coring in chert/chalk; the potential of hydraulic hammers; the feasability of replacing wirelines with Kevlar in very deep holes. Members also took a close interest in the Diamond Coring System (DCS), which was the subject of several presentations during the workshop and which will be tried out on Leg 124E. Several members of the TEDCOM will participate in that leg.

The TEDCOM voted unanimously that Prof. Rischmüller should be nominated member of the committee.

It was decided that the next meeting should take place in the spring 1989. The chairman will explore the possibility of holding it in Japan during a port call of the JOIDES RESOLUTION.

LIST OF ATTENDEES

TEDCOM members:

Charles	SPARKS	IFP, chairman
Martin	CHENEVERT	University of Texas
Keith	MANCHESTER	B.I.O. Canada
Claus	MARX	ITE Clausthal
Archie	McLERRAN	Consultant
Keith	MILLHEIM	AMOCO
Frank	SCHUH	Consultant.

TEDCOM replacements:

Noel	AVOCATO	CHEVRON (for Bill COTTEN)
Robert	COLLIN	ELF AQUITAINE(for Jean BONNASSE-GAHOT)
Junzo	KASAHARA	Univ. of Tokyo (for Hiromi FUJIMOTO)
Alan	MILTON	BRITOIL (for David GRASSICK).

Liaisons:

Barry	HARDING	TAMU
Al	SUTHERLAND	NSF

Observers:

Jean-Baptiste	FAY	IFP
Claude	MABILE	IFP
Heinrich	RISCHMULLER	KTB

Guests:

Jack	PHEASANT	BGS
Dick	MORRIS	DIAMANT BOART
Knut	WADET	FARMAND SURVEY.

TAMU - EDO staff:

Glen	FOSS	Supervisor of Drilling Operations.

Apologies:

Emilio	LUNA SIERRA	HISPANOIL (TEDCOM)
Tim	FRANCIS	I.O.S. (PCOM)
Paul	STANTON	EXXON (TEDCOM)
Walter	SVENDSEN	LONGYEAR (TEDCOM)
Percy	WICKLUND	DOSECC
Paul	WORTHINGTON	(DMP)
Duke	ZINKGRAF	SEDCO.

Absent:

Bert	DENNIS	L.A.N.L. (TEDCOM).

AGENDA

Introduction

O.D.P./E.D.O. Finances

Legs 119 - 123 Operations Reports

Objectives of Engineering Leg 124E

Technical Requirements of O.D.P. Engineering

TEDCOM Membership

Next Meeting.

Introduction

Charles SPARKS welcomed members, liaisons and guests to the sixth TEDCOM meeting.

He presented the agenda and took the opportunity of giving an update on O.D.P. related work that his organisation (IFP) had been involved in, since the last meeting (Feb. 1988). The "Pallograph" instrument for recording precisely the heave/pitch/roll movements of the JOIDES RESOLUTION had been installed on board in Feb. 1988. Recordings made during Leg 120 were received back in June and were at present being processed. They should not only give precise knowledge about the ship movements - valuable in itself - they should also, when fed into a riser simulation program, allow predictions to be made about the behavior of drill strings and risers, when hung off in great water depths from the JOIDES RESOLUTION or similar ships.

Charles also mentioned calculations that had been done at IFP related to the O.D.P. drill rod fatigue tests that had been carried out in relation to the mining drilling system, to be tried out on Leg 124E. The calculations, which were very trickly because of the presence of the tool joints and tension in the drill rods, had shown that the bending radius simulated (176 ft) was half that of the guide horn (radius 350 ft) on the JOIDES RESOLUTION. Thus proving that tests were exceptionally severe.

O.D.P./E.D.O. Finances

Al SUTHERLAND reported on the funding of O.D.P. and E.D.O. (Engineering and Drilling Operations). He pointed out that the NSF budget for 1989 had been increased by 9.8% and that the NSF contribution to O.D.P. should be up by 4.6%, although this had yet to be confirmed. He noted that the E.D.O. budget had been increasing and was continuing to increase at a higher rate than for O.D.P. as a whole. A significant increase (25%) was expected for E.D.O. in 1990, when the budget should be raised to $4.42 M out of the total O.D.P. budget of $38 M.

Al revealed that Australia was about to join JOIDES in a consortium with Canada. In effect Australia would take on the payment of one third of the present canadian contribution. Thus australian participation would not lead to any additional funding.

Charts showing the evolution of O.D.P. and E.D.O. funding are included at the end of this report.

Al mentioned that the draft of a ten year plan for O.D.P. was being prepared and was due out in spring'89. He also mentioned the O.D.P. plan which was reviewed by a NSF panel in June 88 and subsequently presented to the board. The plan was highly commended and unanimously approved. Areas were however identified where increased emphasis was required. One of these, of particular significance for the TEDCOM, was "support for improvements in drilling technology".

Legs 119-123 Operations Reports

Glen FOSS reported on the principal results, of importance to the TEDCOM, of the legs operated since Dec. 87.

Leg 119 saw the JOIDES RESOLUTION return to the Antarctic areas of the Kerguelen Plateau and Prydz Bay, with the assistance of the Maersk Master support vessel. The latter was again of outstanding value. It was required on many occasions to tow bergs, some of them weighing upto 5 million tonnes. A total of twenty two holes were cored.

The Prydz Bay sites were nearly all underlain by an extremely hard layer of "diamictite" that had been enormously over-consolidated and resembled asphalt pavement. Softer material lay below these layers which led to hole stability problems and poor core recovery. The core recovery of the "diamictite" was sometimes good and sometimes very poor for reasons that were not fully understood.

Leg 120 was exceptionally long (69 days) during which time the ship sailed 9206 miles. Only 28 days were spent on site however, as a result of the tragic death of Lamar Hayes which necessitated a return mid-leg to Freemantle. During the leg exceptionally severe sea states were encountered with 40 ft waves at times. They were the worst sea states that the JOIDES RESOLUTION had ever experienced. Work continued on hole 750 (2000 m water depth) in these conditions in spite of 15° roll movements, but the drill string heave compensator had difficulty in maintaining constant tension in the confused seas that had wave periods in the range 5-6 secs. Very large force variations were registered (+/- 60 000 lbs). At times the compensator stroked out. On hole 748, very poor core recovery was obtained (15%) with the XCB when coring in chalk with chert stringers, which destroyed the XCB shoes.

Leg 121. From previous experience with the DSDP program very unstable hole conditions were expected at the Broken Ridge site. This did not turn out to be the case. The new XCB-121 core barrel was tried for the first time and was a considerable improvement on the previous version. However, the distribution of flow between the XCB and the cutting shoes needs to be improved.

Leg 121 also saw the first real application of the Navidrill (NCB2-121). Two outstanding cores were recovered in material too hard for the XCB. Core recovery was initially 100% but then soil conditions changed. Later cores were not so good. The hydraulic pressure, measured at the surface, was difficult to interpret. If the NCB is to be used effectively, it is essential to have real time feed back of downhole coring results.

ODP is interested in recording (in real time) drilling parameters so that they can be compared with the percentage and quality of cores recovered. TEDCOM members pointed out that such data would have to be analysed immediately, by the person who made the recordings, if they were to be of value. Raw data would quickly become inexploitable otherwise.

Glen mentioned that the XCB had been a great success on Leg 122. It had been used to core more than 700 m (down to 2 300 m) on one hole. At the first site of the leg, the RCB had been used to core to 500 mbsf. At that point (600 m above target) the hole had to be terminated because of traces of hydrocarbons and hole cave-in problems.

Leg 123 began on 2 September. At the time of the meeting, an 11" casing was being set in a hole that had been drilled to basement. ODP hoped to attain great depth with that hole.

Engineering Leg 124E

Barry HARDING presented the engineering objectives of Leg 124E, which is planned to last from 9 Jan. to 15 Feb. 1989.

The principal objective is to test the Diamond Coring System (DCS), which had been presented during the workshop the previous day. The intention is to drill down to basement using the API drill string and then to thread a small diameter mining drilling rod within it and proceed with "piggy back" drilling and coring of about 200 m of basement. The drill rods, to be used for the test, are made of S 140 steel with upset joints. These had been chosen for economical reasons although it was realized that flush joints reduced risk of sticking, as Keith MILLHEIM pointed out. The key to the success of the test was the double heave compensation system. The primary system would have to maintain minimal weight on the bit, of the API string, while a secondary heave compensator (in series with the primary one) would have to compensate for elastic stretch of the API string and maintain weight on the bit, of the mining drill rods, to within +/-1 000 lbs.

To operate the DCS system, men would have to stand and work on a small platform, suspended from the main heave compensator. Barry emphasised that a detailed safety study had been undertaken. The men would wear safety harnesses and would be sujected to a maximum acceleration of 5 g in the case of failure of the drill string.

Barry mentioned that the second objective of the leg was to test drilling/coring tools and methods in soil conditions that have always been particularly difficult for O.D.P. Interbedded layers of chert/chalk are among the most difficult. Bit weight and pumping requirements are very different for each layer. It would be most useful to know the positions and thicknesses of these layers precisely. An attempt will be made to determine these during the tests at site No.3 of the Engineering Leg. A transducer will be fitted to the television camera which will be lowered down the drill string to the seabed. Geophysicists are optimistic that it will be possible to determine the exact positions and thicknesses of the chert layers this way.

Barry also mentioned the pressure core barrel (PCB) which will be tested during the leg. Martin CHENEVERT warned that the crew would have to be most careful, when opening the barrel on the ship, if there were any risk of presence of H_2S, since it could be extremely dangerous for them.

Space for O.D.P. personnel on the engineering leg is limited to fifty berths including seven scientists. It will be possible for some participants to join/leave the ship after two weeks, following completion of work at the first site.

A further engineering leg is planned (129E) to take place early 1990 (see table of planned Legs at the end of this report).

Future technical requirements of O.D.P. Engineering

Barry HARDING announced that the EDO was continuing to be reinforced by engineers detached temporarily from companies. Hirooshi MATSUOKA of the Japan Drilling Co. had recently joined them and Jean-Baptiste FAY of IFP was also going to do work for EDO, although he would remain based in France. This was regarded as an important experiment, since it would be the first time EDO had tried such an arrangement. Jack PHEASANT might be detached from B.G.S. to EDO in 1989.

Barry presented the drilling problems that O.D.P. had to solve (see lists added to this report). The drilling & coring of cherts, with alternating hard/soft layers, posed one of the greatest problems. Keith MILLHEIM mentioned that impregnated bits were useless in such cases. AMOCO had found that the best results in cherts were obtained with minature step type bits.

About the possibility of increasing hole penetration by developing bits that could be lowered down the drill string in parts and reassembled down hole, TEDCOM participants were very sceptical. (This technology, developed in Russia for ultra deep holes, had been presented at the workshop the previous day). It was pointed out that all the russian ultra deep holes were now virtually at a stand still, thus proving that the technology could not be effective.

In connection with drilling deep small diameter holes (4"), Barry HARDING mentioned that he had encountered objections that it was impossible to log such small holes with existing equipment. Keith MILLHEIM assured him that this was not so. Even 3" diameter holes could be logged with existing equipment. Furthermore he pointed out that there was in fact no point in logging holes that had been continuously cored. All the information could be obtained better and more easily from the cores themselves.

The problems of retrieving cores in great depths (up to 14 km) was discussed since the self weight of the wire line reduced the safety factor to an unacceptable level (below 2). O.D.P. was looking at the possibility of using Kevlar lines. It was mentioned that experience existed in using such lines down to depths of 6 000 m. Jack PHEASANT gave an up-date of B.G.S. experience with Kevlar lines. The lines themselves and end pieces pose no problem, but it is difficult to transmit data and energy with them. B.G.S. has tried building copper wires into the lines, but strains were incompatible and the wires failed. Optical fibres can be used successfully for data transmission but not for power.

In connection with the problem of drilling hard/soft interbedded layers and fractured basalts, Claus MARX alluded to coring with hydraulic hammers. Such hammers had been developed in China, but results had been disappointing because of the inferior quality of their drilling bits. The german Ministry of Geology and Exploration was supporting research on hydraulic hammers. Prof. RISCHMULLER added that he considered hydraulic hammers had a great potential for taking small diameter cores. Knut WADET mentioned that Farmand Survey was considering the purchase of a chinese hydraulic hammer, for taking cores of up to 100 m, in 500 m of water.

Technical issues to common interest to KTB-O.D.P.

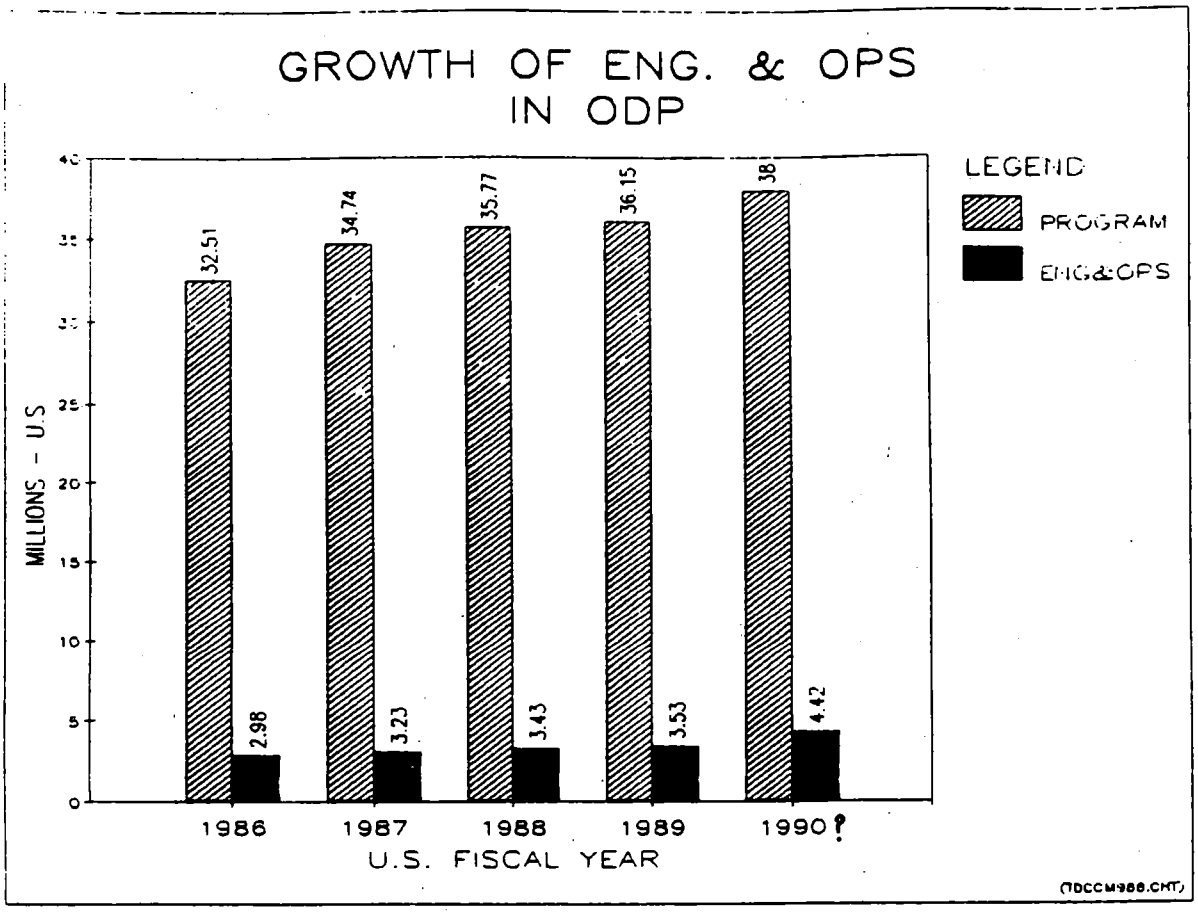
Barry HARDING presented a list of topics that he thought could be profitable studied in common by KTB-O.D.P. (see attached list).

TEDCOM membership

Charles SPARKS explained that he wished to nominate Prof. RISCHMULLER as an additional member of the TEDCOM given the very valuable experience that he had to contribute to ODP and the TEDCOM. He therefore asked TEDCOM members and their replacements to vote on the motion that Prof. RISCHMULLER be nominated to the TEDCOM. The motion was seconded by Keith MILLHEIM and carried unanimously. Prof. RISCHMULLER accepted to become a "member-at-large", with the FRG paying his travel costs, if the PCOM confirm his nomination.

Next meeting

It was decided that spring 1989 would be an appropriate time to hold the next meeting, since it would allow the results of engineering Leg 124E to be analysed and presented. Plans for Leg 129E could also be discussed. The meeting could be held in College Station or in Japan, where the JOIDES RESOLUTION would be calling in April and June 1989. In that case the TEDCOM meeting could be combined with a visit of the ship, which many members had not yet seen. Charles SPARKS will therefore contact Hiromi FUJIMOTO about the possibility of holding the seventh TEDCOM meeting in Japan in April or June 1989.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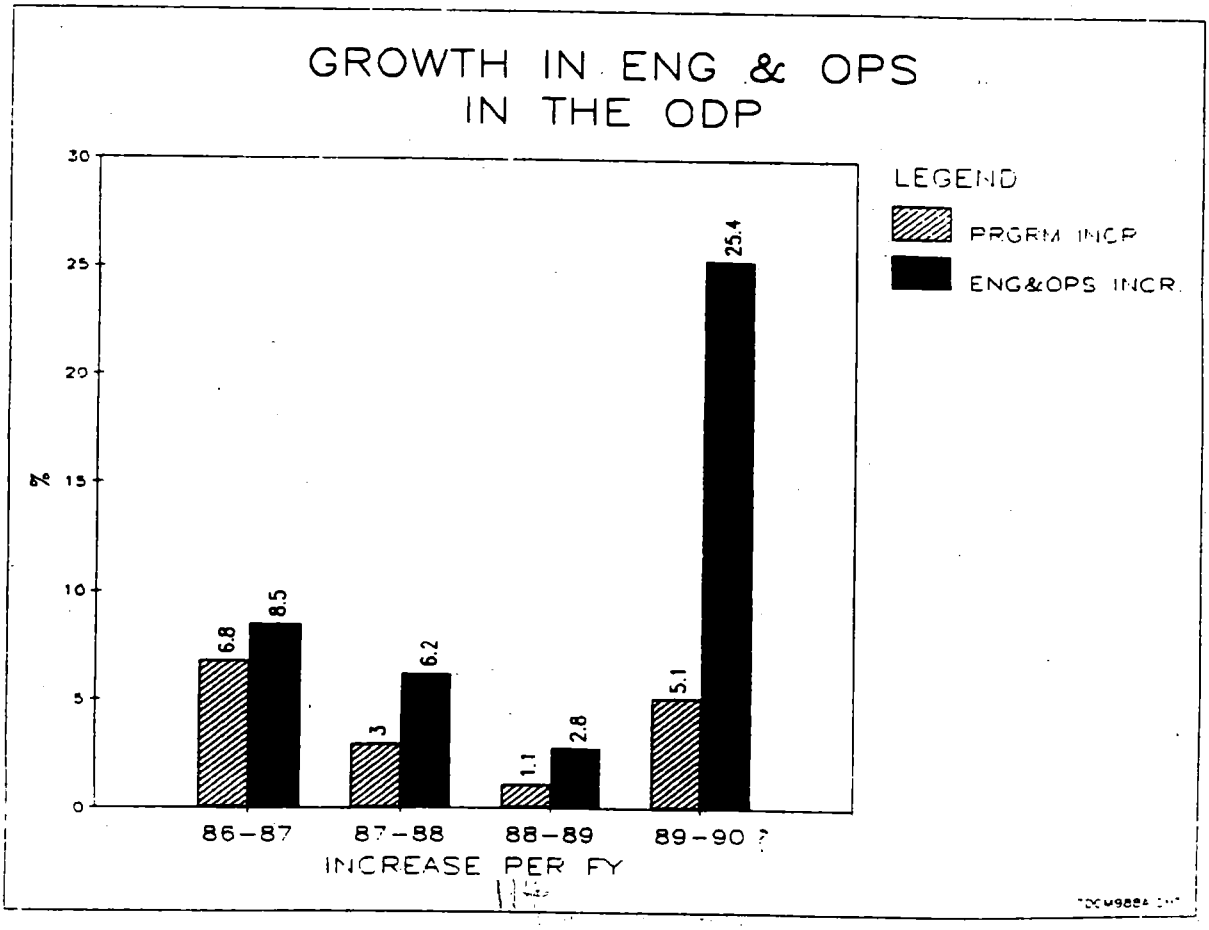
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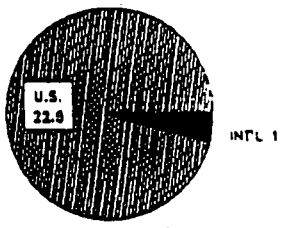
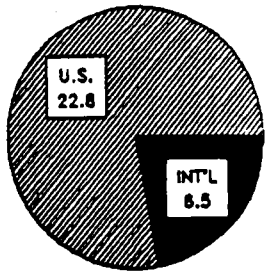
ODP – U.S. VS INT'L FUNDS



FY 84 = $23.5



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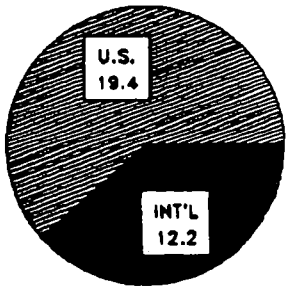

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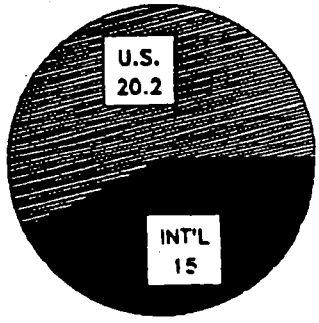
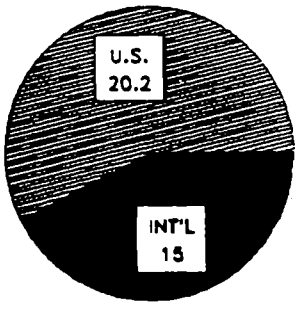


FY 87 = $35.2

(INTPI187.CHT)

ODP – U.S. VS INT'L FUNDS



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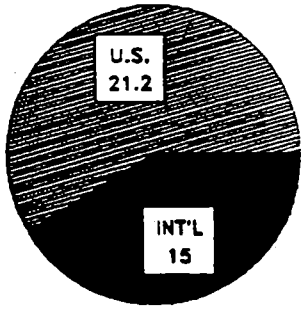
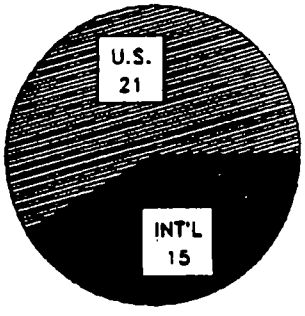
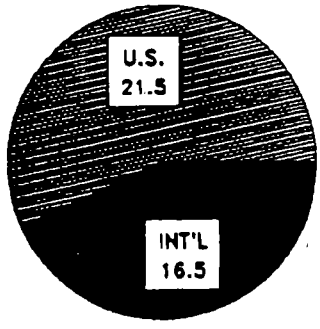


FY 88 = $36.2



FY 89 = ~~$36.0~~ 36.5



FY 90 = $38.0

(INTPI190.CHT)

ODP OPERATIONS SCHEDULE

Leg	Objective	Departs Port	Departs Date	Arrives Port	Arrives Date	Port Days	Days at Sea
121	Broken Ridge & Nintyeast	Fremantle	5/06/88	Singapore	6/28/88	6/28-7/02	53
122	Exmouth Plateau	Singapore	7/03/88	Singapore	8/28/88	8/28-9/01	56
123	Argo Abyssal Plain & Exmouth Plateau	Singapore	9/02/88	Singapore	11/01/88	11/01-05	60
124	SE Asia Basins	Singapore	11/06/88	Manila	1/04/89	1/04-08	59
124E	Engineering I	Manila	1/09/89	Guam	2/15/89	2/15-19	37
125	Bon/Mar	Guam	2/20/89	Tokyo	4/18/89	4/18-22	57
126	Bon 2	Tokyo	4/23/89	Yokohama	6/19/89	6/19-23	57
127	Japan Sea I	Yokohama	6/24/89	Hakodate	8/20/89	8/20-24	57
128	Japan Sea 2	Hakodate	8/25/89	?	10/5/89		41
	- - - - - - - D R Y D O C K (14 D A Y S) - - - - - - -					10/5-10/18	
129	Nankai	?	10/19/89	?	12/18/89	12/18-22	60
129E	Engineering II	?	12/23/89	?	1/21/90?	?	30?

Revised 9/5/88

CURRENT ODP ENGINEERING DEVELOPMENT PROJECTS

* INTEGRATION OF A MINING CORING SYSTEM
* REFINEMENT OF NAVIDRILL FOR BASEMENT DRILLING & PHYSICAL PROPERTIES PILOT HOLES
* PDC CORE BIT DEVELOPMENT
* XCB SYSTEM IMPROVEMENTS
* PRESSURE CORE BARREL SYSTEM
* ORIENTED ROTARY CORING
* HI-TEMP CORING INITIAL STUDIES
* DRILL STRING STRESS/DYNAMICS ANALYSIS
* KEVLAR SANDLINE INVESTIGATION

ODP DRILLING PROBLEMS TO SOLVE

* HARD/SOFT/HARD INTERFACES WITH GOOD RECOVERY (CHERTS)
* LONGER BIT LIFE IN HARD FORMATIONS
* DRILLING DEEPER BOREHOLES THROUGH SEDIMENTARY SEQUENCES (2-3 km)
* MWD TECHNOLOGY
* DEEP DRILLING IN HIGHLY-STRESSED CRYSTALLINE ROCKS
* FRIABLE FORMATION (SAND, BIOCLASTIC LIMESTONE, ETC.) CORE RECOVERY & HOLE STABILITY
* HIGH TEMPERATURE DRILLING CAPABILITY (>400^{o}C)
* FRACTURED (YOUNG) BASALT DRILLING/CORING

STATUS OF THE CEPAC PROGRAMS

Program: **Flexure of the lithosphere**
Status of surveys: Complete
Engineering development required: None
Comments: Age-dating controversy remains unresolved as of July, 1988. If 100,000-year resolution is required the project probably can not be done; 500,000-year resolution may be achievable.

Program: **Chile triple junction**
Status of surveys: Completed, MCS data not fully processed
Engineering development required: None
Comments: Proponents must submit a revised proposal incorporating new data and choosing drill sites.

Program: **Cascadia accretionary prism**
Status of surveys: Abundant data exist, additional MCS surveys are funded for the Oregon margin in 1989. MCS data exist for the Vancouver margin although more such information would aid in defining the structures to be drilled.
Engineering developments required: Methodology for fluid sampling and in-situ pressure determination.
Comments: Proponents must submit a revised proposal (Vancouver) or site selection (Oregon) incorporating new data as appropriate.

Program: **Old Pacific: M-series dating and Jurassic crust**
Status of surveys: Final set of MCS data to be collected in spring of 1989.
Engineering development required: Recovery of chert-chalk sequences.
Comments: Proponents must submit a revised proposal incorporating new data and choosing drill sites. Probably not compatible with the main objectives of "geochemical reference holes".

Program: **Sea level and subsidence: atolls and guyots**
Status of surveys: Completed, seismic data not fully processed
Engineering development required: Recovery of chert-chalk sequences (one site).
Comments: Proponents must submit a revised proposal incorporating new data and choosing drill sites. May be suitable for insertion into the WESTPAC program 1990 schedule.

Program: **Ontong Java Plateau depth transect**
Status of surveys: Funded for fall of 1988
Engineering development required: Recovery of chert-chalk sequences if deep objectives are to be drilled, otherwise none.
Comments: Proponents must submit a revised proposal incorporating new data and choosing drill sites. May be suitable for insertion into the WESTPAC program 1990 schedule.

Program: **Neogene paleoceanography of the eastern Equatorial Pacific**
Status of surveys: Adequate for nearly all sites, proposal submitted for remaining work.
Engineering development required: None

Comments: Nearly ready to go.

Program: North Pacific Neogene
Status of surveys: Complete in the Northeast Pacific; underway in the central and western North Pacific.
Engineering development required: None
Comments: Some proponents must submit a revised proposal incorporating new data and choosing exact drill sites.

Program: Bering Sea high latitude paleoceanography
Status of surveys: Complete
Engineering development required: None
Comments: Proponents need to update proposal with more recent data and selection of exact sites.

Program: Shatsky Rise anoxic events
Status of surveys: Needed, not planned
Engineering development required: Recovery of chert-chalk sequences is crucial to this program.
Comments: Program can not go without digital single channel seismic surveys.

Program: Lower crust: penetration of layer 3
Status of surveys: Completed
Engineering development required: Part of an engineering leg to clean out and recase 504B, to be shared with work at EPR.
Comments: Ready to go when hole is cleaned.

Program: East Pacific Rise bare rock drilling
Status of surveys: Complete at the 13N area, some more needed for the site south of the Clipperton FZ.
Engineering development required: Recovery of young brittle basalt, and dealing with hot hole conditions. Part of an engineering leg to set guidebase, shared with 504B cleaning.
Comments: Final plans await report of the EPR working group and a revised proposal identifying exact sites and supporting geophysical data.

Program: Hydrothermal processes at sedimented spreading centers
Status of surveys: Adequate for drilling.
Engineering development required: Dealing with recovery of hot basalt, sediment and water.
Comments: Essentially ready to go; final plans await report of working group and a revised proposal identifying exact sites and supporting geophysical data..

Program: Early stages of hot spot volcanism: Loihi
Status of surveys: Complete
Engineering development required: Recovery of young brittle basalt, especially from the top 100 meters. Possible hot hole conditions.
Comments: Will require two bare-rock guide bases.

K.T.B - O.D.P. Joint Development Topics

The following is a list of technical issues that could be jointly developed and technically studied:

ROCK MECHANICS

* Drillability of hard, massive and fractured crystalline rocks.
* Core discing or shattering due to stress relief.
* Hole enlargement caused by spalling of rock.
* Pore pressure gradient measurements to predict and respond to overpressured zones.
* Rock fracture gradients.

DOWNHOLE MOTORS

* Various types (electric, Moineau, turbines).
* Applicability of downhole motors to coring (wireline and conventional).

DRILL STRING

* Availability of materials other than steel (aluminum, titanium, graphite or carbon fiber composites).
* On-site inspection methods.

BITS

* Available and new design coring bits such as roller cone, diamond compacts, impregnated, etc.
* Bit life and rate-of-penetration factors in bit design.
* Weight, torque, rpm, and hydraulic requirements for various bit designs.
* Available bit testing facilities.

CORE BARRELS

* Wireline and conventional barrel comparison.
* Wireline tool adaption to downhole motors--Navidrill.

5-KM WIRELINE AND HOIST

* Wireline construction options as graphite composites, aramid fibers, titanium, etc. (Kevlar Lines)
* Dual use of wireline for retrieving core and for hardwire measurement-while-drilling (MWD) telemetry.

MEASUREMENTS WHILE DRILLING (MWD)

* MWD in wireline coring programs.

OCEAN DRILLING PROGRAM

SITE SURVEY PANEL MINUTES

University College of Swansea
Swansea, Wales

October 4-6, 1988

Present :

Greg Mountain* *(Chairman, USA)*
Fred Duennebier* *(USA)*
Rob Kidd* *(UK)*
Birger Larsen* *(ESF)*
Steve Lewis* *(USA)*
Heinrich Meyer* *(Germany)*
John Peirce* *(Canada)*
Kiyoshi Suyehiro* *(Japan)*
Jack Baldauf *(TAMU, alt. for A. Meyer)*
Carl Brenner *(Data Bank)*
Peter Davies *(BMR, Australia)*
Tim Francis *(PCOM)*
John Jones *(ULondon, UK)*
Dave McKenzie *(PPSP)*
Laurent d'Ouzouville *(JOIDES office)*
Lindsay Parson *(IOS, UK)*

Absent :

replacement for Alain Mauffret**(France)*

* *panel members*

Appendix R

SITE SURVEY PANEL

Swansea, Wales
October 4-6, 1988

EXECUTIVE SUMMARY

1. IMPACT OF THE NEW ADVISORY STRUCTURE ON SSP FUNCTIONS

Past success of SSP in identifying and correcting shortfalls of site survey adequacy have been made possible by lead times between initial panel review and actual drilling that are on the order of three years or more. These early reviews have been possible due to drilling prospectuses being prepared by regional panels. SSP emphasizes that this responsibility will now fall on the thematic panels, and stresses that they continue to supply SSP with prospectuses that are sufficiently mature AND sufficiently early for meaningful evaluation.

2. UNDERWAY GEOPHYSICS

The SSP continues to be concerned about the shortcomings of underway geophysics onboard the *Resolution*. Of greatest concern is the need to evaluate navigation quality in real-time, and to be able to produce smoothed navigation in a timely fashion. Secondary items relate to plotting various parameters along track, improving the 3.5 and 12 KHz systems, and improving the shipboard seismic acquisition and recording systems.

3. ASSESSMENT OF SCHEDULED WPAC PROGRAMS

A. Leg 125

In contrast to the report at the last SSP meeting, no piston cores are available at BON6; if this is to be a re-entry site, the ODP/TAMU engineers must be alerted to this inadequacy. Available information suggests there is little sediment cover at MAR3, and while SSP points out the likelihood of this being an effectively "bare-rock" site, unsupported spud-in may be possible.

B. Leg 126

Survey data is adequate for drilling at BON1. However, large variations in heat flow values indicate intensive hydrothermal circulation. There exists the possibility of encountering high temperatures within upwelling zones, possibly in the immediate vicinity of normal fault scarps. SSP urges the proponents finalize recent measurements, incorporate them with previous data and with the known fault distribution, and discuss anticipated target depth temperatures with both ODP/TAMU engineers and with PPSP.

C. Leg 127

New MCS profiles were reviewed. Sites J1d and J1e are approved for drilling. Acoustic stratification beneath the proposed basement reflector at J3b warrant further investigation before this site is approved.

D. Leg 128

Sites J2a and JS2 were approved by SSP at its last meeting.

E. Leg 129

Sites NKT1 and NKT2 were approved by SSP at its last meeting.

4. ASSESSMENT OF NON-SCHEDULED WPAC PROGRAMS

A. Northeast Australia

An exceptionally thorough data package across 13 NE Australia sites was presented to the Panel. All sites (NEA1-6 and NEA8-14) are approved.

B. Lau Basin

New information from *Darwin-33* was reviewed, and it revealed complexities unrecognized in earlier survey data of Lau Basin. Before SSP can evaluate the adequacy of the total survey package, a revised and unified set of drilling objectives must be developed. A request that Jim Hawkins collect additional data may be desirable.

C. Vanuatu

All Vanuatu sites except the prime site DEZ2 are approved for drilling. Velocities at DEZ2 are reasonably interpreted by Fisher + Collot. However, there is a reasonable chance that the drilled section will be highly fractured, and SSP suggests that penetration to even the most optimistic target depth of 850 m may call for re-entry. No piston cores are available to assess physical properties of surficial sediments, and SSP recommends that PCOM evaluate the need for this information and consider requesting ORSTOM collect piston cores at proposed Site DEZ2.

D. Geochemical Reference Sites

SSP discussed the three-hole geochemical reference site program and reached the following consensus: 1) sufficient data exist for specifying the location of BON8, though this has yet to be done; 2) MAR4 is sufficiently well surveyed, but the chance for adequate drilling recovery in hard-soft layers has yet to be determined; and 3) survey data and specific site location for MAR5 have not been identified.

5. PRELIMINARY ASSESSMENT OF CEPAC PROGRAMS

A. Flexure of the Lithosphere
- not reviewed at Swansea meeting
- chronostratigraphic control is essential; pilot study based on paleomagnetics is forthcoming

B. Chile Triple Junction
- all survey requirements have been met, and with the preliminary MCS profiles, tentative sites have been selected
- SSP awaits final processing and site selection

C. Cascadia Accretionary Prism

1) Vancouver décollement
- crossing MCS lines are needed at proposed sites
- better three-dimensional definition of accretionary wedge is strongly recommended to optimize exact site locations

2) Oregon transect
- SSP urges that before the next MCS survey grid is collected that PPSP be consulted for its advice re: track spacing, acquisition parameters, extent of processing, etc.

D. Old Pacific Crust
- basement at recently surveyed Sites PIG3+4, EMB1+2 is inadequately imaged
- additional Sites PIG1+2 to be surveyed by Suroit in early '89; SSP stresses need for large volume airguns, sonobuoys and magnetics
- due to probability of encountering chert and/or volcanic sills, SSP suggests that chances of meaningful recovery AND successful drilling to basement should be re-evaluated after Navidrill test on 124E

E. Paleogene and Mesozoic Paleoceanography and Sea Level Seamount-Guyot and Subsidence Histories: Central Pacific
- preliminary review of recently acquired SCS and 3.5 KHz underscores the complex subsidence histories of guyots and the need for integration with regional tectonic models

F. Ontong-Java Plateau
- survey cruise scheduled for Nov, '88

G. Neogene Paleoceanography in the Eastern Equatorial Pacific
- SSP urges proponents to continue search for better seismics than are shown in prospectus; if none are found, then additional N-S hi-res SCS and 3.5 KHz profiles are needed

H. North Pacific Neogene
- Patton Seamount data package is adequate
- SSP awaits the presentation of a mature data package for Sites Meiji 1+2 and NW 1, 3 + 4. The proponents ought to investigate all available repositories of high-res SCS data; many of the small-volume air gun records shown in the prospectus are inadequate.

I. The Bering Sea: High-latitude Record of Late Mesozoic to Cenozoic Climate and Tectonics
- not reviewed at Swansea meeting
- survey package appears to be adequate from SSP perspective

J. Shatsky Rise, Anoxic Events
- SSP awaits the presentation of a mature data package for drilling on Shatsky Rise. Bottom current erosion and slumping have been important processes on the flanks of this feature, and optimal site location requires a dense net of high-res SCS to define the targets.

K. Lower Crust: Penetration of Layer 3
- Adequate data exist for deepening Hole 504B.

L. EPR Bare Rock Drilling
- Specific locations have not been selected. The report of the EPR working group demonstrates that the likely proponents are aware of the need to integrate a complex array of survey technologies.

M. Hydrothermal Processes at Sedimented Ridge Crests
- not reviewed at Swansea meeting

N. Early Stages of Hot Spot Volcanism: Loihi
- adequte survey package lacking only in side-scan imagery from a deep-towed source

6. OTHER MATTERS

A. SSP encourages the Deep Submergence Lab to submit to the JOIDES office an "idea proposal" that 1) describes the capabilities of its towed vehicles, and 2) suggests applications to upcoming site surveys.

B. The next meeting of SSP is tentatively scheduled for three days in Hawaii during the first two weeks of March, 1989.

SITE SURVEY PANEL

Swansea, Wales
October 4-6, 1988

ACTION ITEMS

*ACTION - **Laurent d'Ouzouville** will mail a copy of the July, '88 CEPAC prospectus to each member of SSP who does not already have one.*

*ACTION - **Laurent d'Ouzouville** will distribute to each site proponent (or team of proponents) the most current site survey matrix (see Appendix B1+2) as each new proposal is received at the JOIDES office. The proponent(s) will be required to complete the matrix before the proposal is logged in.*

*ACTION - **Fred Duennebier and John Peirce** will prepare a statement in reponse to TAMU's request for an SSP consensus re: the needs for implementation of an underway geophysical data processing capablility aboard Resolution.* (This statement was reviewed and finalized by the full panel on day 3 of this meeting, and is included as Appendix D.)

*ACTION - **Jack Baldauf** to coordinate actions at TAMU in response to SSP comments on underway geophysics (Appendix D), and report back to SSP at its next meeting.*

*ACTION - **Carl Brenner** will gather estimates for the costs of reproducing EPR syntheses, and present these at the next SSP meeting.*

*ACTION - At the upcoming PPSP meeting in Hawaii, **Laurent d'Ouzouville** will present SSP's request that JOIDES distribute the most current safety guidelines to the site proponents of all new proposals at the time they are received at the JOIDES office.*

*ACTION - **Carl Brenner** to write to Alan Cooper requesting a copy (on reproducible substrate if possible) of the version of the seismic line he feels is most useful to the interpretation of drilling results in Prydz Bay.*

*ACTION - **Jack Baldauf** will assemble the history of mini-cone deployment, noting especially performance in various surficial sediment types, and will relay findings to both the TAMU engineers and to Greg Mountain.*

*ACTION - **Fred Duennebier** will send to Jack Baldauf data recently acquired on Moana Wave across Seamount 853 to provide TAMU the opportunity to re-locate ENG1.*

*ACTION - **Jack Baldauf** to inform ODP/TAMU engineers of the lack of piston cores in the vicinity of potential re-entry site BON6.*

*ACTION - **Heinrich Meyer** will search for the record of a piston core taken near MAR3 during the recent Sonne 57 cruise, and will forward a report to Jack Baldauf.*

*ACTION - **Kiyoshi Suyehiro** to coordinate the discussions of probable target depth temperatures at BON1 between site proponents, ODP/TAMU engineers, and PPSP. Correspondence is to be copied to Greg Mountain.*

*ACTION - **Greg Mountain** will write to Ken Tamaki (on bitnet via Kiyoshi Suyehiro) requesting that as site proponent Ken Tamaki 1) analyze pertinent stacking and sonobuoy calculations for velocities that may resolve the ambiguous designation of basement at J3b; 2) deliver location maps of this and all Japan Sea sites showing MCS lines with shotpoints or common-depth-point annotations; and 3) attempt to unify the display scales of the various profiles critical to the proposed Japan Sea sites. Tamaki will be urged to bring these items with him to the October meeting of WPAC for discussion and deposit in the Data Bank.*

*ACTION - **Carl Brenner and Greg Mountain** will locate any relevant sonobuoy data in the vicinty of J3b contained in the L-DGO archives. Greg Mountain will review these findings, plus information delivered to the Data Bank by Ken Tamaki, and will forward an SSP comment on this site to PCOM .*

*ACTION - After the Lau Basin Working Group re-defines proposed objectives and drill sites, **Lindsay Parson** will finalize the Darwin-33 track, send it to **Fred Duennebier** who will then compose a letter to Jim Hawkins requesting seismics, 3.5 KHz and SeaBeam data be collected in the Lau Basin during his upcoming cruise on the Washington.*

*ACTION - After targets are re-focused by the Lau Basin Working Group, **Lindsay Parson** will expedite the A-D conversion and reprocessing of Darwin -33 seismic profiles across Lau Basin sites.*

*ACTION - **Greg Mountain** will contact Fisher + Collot and request they prepare several semblance velocity profiles for CDP's 10 km to either side of DEZ2 on Lines 104 and 1022. Artifacts caused by diffracted arrivals ought to show variable rms velocities; values derived from true reflections should remain consistent across the several analysis points. These velocity graphs are to be made available to WPAC and to Greg Mountain.*

*ACTION - For Vanuatu Site DEZ-2, ODP/TAMU (via **Jack Baldauf**) will provide to WPAC at their October meeting (with copies to G. Mountain and M. Fisher/J.-Y. Collot) a response on the drillng strategy, time estimates, and potential need for piston cores to achieve the site objectives, taking into account: 1) water depth of 2600m ; 2) range of likely penetrations from 800-1300m sub-bottom; and 3) possible occurrence of indurated and fractured volcanoclastic sediments.*

*ACTION - Depending on the outcome of the ODP/TAMU engineers' report and further discussions at the October meeting of WPAC, **Laurent d'Ouzouville** will notify PCOM of the lack of piston cores at DEZ2, a shortfall that could be met by requesting ORSTOM collect these samples.*

*ACTION - **Carl Brenner** will contact Geochemical Reference Site proponent Jim Natland to offer his assistance in compiling data packages for the geochemical reference sites BON8, MAR4, AND MAR5.*

*ACTION - **Greg Mountain** will contact Dave Scholl (USSAC chairman) for names of recommended USSAC members appropriate for replacement of Fred Duennebier to SSP.*

*ACTION - **Fred Duennebier** to arrange for reservation of remote University of Hawaii convention center for three days during the first two weeks of March, 1989.*

SITE SURVEY PANEL

Swansea, Wales
October 4-6, 1988

MINUTES

1. PRELIMINARY MATTERS

The chairman welcomed the attending panel members and liaisons, and introduced guests Peter Davies, John Jones, Lindsay Parson and substitute TAMU liaison Jack Baldauf.

Host Rob Kidd welcomed all attendees to Swansea and outlined scheduling details. The minutes from the previous meeting were approved. Ship schedules were presented and are attached as Appendices A1-A9.

2. REPORTS

A. PCOM (Tim Francis)

Participant contributions will increase by 10% to $2.75M beginning in FY '90. Australia will be joining Canada in a consortium membership as of FY'89. Signature by the Australian Minister is expected this month. John Peirce summarized the probable shared assignments of Canadian and Australian members to the various ODP panels, details of which appear in the to-be-signed MOU.

Highlights of an NSF/National Science Board review of ODP were presented: 1) ODP needs to maintain constructive relationships with other global programs; 2) concentrating on a smaller number of projects with adequate time is preferable to dealing with many projects with too little time; 3) improvements in drilling technology continue to be of high priority; and 4) the lack of thematic style of ODP publications must be remedied.

The upcoming PCOM meeting will establish the FY '90 program pertaining to Nankai Trough, a possible 2nd engineering leg, geochemical reference sites, NE Australia, Vanuatu and Lau Basin.

This same year-end PCOM meeting of 1989 will be setting the FY '91 program objectives, and will be drawing from programs summarized in the CEPAC prospectus of July '88. Few SSP members have as yet received a copy of this latter document.

ACTION - Laurent d'Ouzouville will mail a copy of the July, '88 CEPAC prospectus to each member of SSP who does not already have one.

John Peirce pointed out that in the absence of any drilling plans beyond CEPAC, lead time sufficient for meaningful evaluation by SSP will begin to decrease. He noted that with the change from drilling programs developed under regional guidelines to those of thematic design, the job of SSP review will become more complex. Fred Duennebier added that a similar concern had been raised at the most recent USSAC meeting.

SSP CONSENSUS - Past success of SSP in identifying and correcting shortfalls of site survey adequacy have been made possible by lead times between initial panel review and actual drilling that are on the order of three years or more. These early reviews have been possible due to drilling prospectuses being prepared by regional panels. SSP emphasizes that this responsibility will now fall on the thematic panels, and stresses that they continue to supply SSP with prospectuses that are sufficiently mature AND sufficiently early for meaningful evaluation.

SSP CONSENSUS - To ensure that proponents are aware of the types of data expected of an adequate survey package, SSP requests that site proponents be required to complete a site survey matrix at the time they submit their proposal to the JOIDES office.

ACTION - Laurent d'Ouzouville will distribute to each site proponent (or team of proponents) the most current site survey matrix (see Appendix B1+2) as each new proposal is received at the JOIDES office. The proponent(s) will be required to complete the matrix before the proposal is logged in.

Tim Francis outlined the changes in panel structure to begin in calendar '89, and which will include: 1) abolition of all regional panels, except for WPAC and CEPAC which will remain intact until termination of their respective drilling programs; 2) splitting of SOHP into a) Sediment and Geochemical Processes and b) Ocean History; and 3) creation of the new service panel entitled Shipboard Measurements.

Panel mandates have been updated. The wording of that pertaining to SSP (Appendix C) was reviewed by Fred Duennebier and found to differ very little from the existing mandate.

B. JOIDES (Laurent d'Ouzouville)

The JOIDES office has officially moved to HIG. Laurent expressed his willingness to assist all panel members in whatever way he can, and encouraged each to maintain an open communication link with himself and the rest of the JOIDES office staff.

C. TAMU (Jack Baldauf)

The most recent *Resolution* schedule was distributed (Appendix A10). The only changes from the previous version included 1) 2 days added to Leg 124E, and 2) 1 day each subtracted from Legs 126 and 127.

Co-chiefs for scheduled legs will be: Brian Taylor and Tadahide Ui (Leg 126), Kensaku Tamaki and Ken Pisciotto (Leg 127), Keyoshi Suyehiro and Jim Ingle (Leg 128) and Asahiko Taira and Ian Hill (Leg 129). That staff scientist assignments are not finalized is due, in part, to upcoming staff turnovers.

Preliminary summaries of Leg 123 results (now in progress) were reported.

TAMU recognizes a need to consolidate and improve upon underway geophysical data display and processing aboard the *Resolution* . To help in developing a plan, TAMU requests recommendations from SSP with regard to: 1) navigation--is real-time display of ship's position required? if yes, how advanced beyond "raw" navigation should it be? is smoothed, processed navigation of use if available after 24 hours? 2) what kind of on-board processing of other geophysical data are required? 3) to implement any improvements, should TAMU adopt a processing package already in place at another institution? or should it attempt to develop its own?

ACTION - Fred Duennebier and John Peirce will prepare a statement in reponse to TAMU's request for an SSP consensus re: the needs for implementation of an underway geophysical data processing capablility aboard Resolution. (This statement was reviewed and finalized by the full panel on day 3 of this meeting, and is included as Appendix D.)

ACTION - Jack Baldauf to coordinate actions at TAMU in response to SSP comments on underway geophysics (Appendix D), and report back to SSP at its next meeting.

D. Data Bank (Carl Brenner)

The data bank is operating in the black, thanks in part to JOI's understanding of the real costs of maintaining an archive facility. A new microfilm reader has been ordered, soon to be delivered. One of the three, full-size, color versions of the EPR Synthesis will soon be deposited in the Data Bank; a second copy will be made available to co-chiefs on the pertinent drilling legs. The distribution of additional copies requested of the Data Bank will raise a difficult issue of cost: should the Data Bank be expected to meet all reasonable requests, regardless of expense? is there an alternative format (e.g. smaller and/or b+w display) that would be acceptable? The SeaBeam displays may be the most important to preserve in color: could URI supply copies to the Data Bank at cost?

ACTION - Carl Brenner will gather estimates for the costs of reproducing EPR syntheses, and present these at the next SSP meeting.

At its next meeting, SSP will recommend how and in what format EPR syntheses should be made available upon request from the the Data Bank.

E. PPSP (Dave McKenzie)

In response to a request from SSP, Dave McKenzie (liaison from PPSP) presented a short description of the structure and mandate of PPSP, plus the evaluation criteria that PPSP applies to each program before granting approval for drilling. He emphasized that the goal of the safety review was to allow the Ocean Drilling Program to achieve its scientific objectives safely . The aim of the PPSP, he continued, is to conduct the safety review in a non-confrontational manner.

From the standpoint of safety alone, the major hazard of open hole drilling is encountering formations that contain large concentrations of biogenic or thermogenic gas. Both types pose a fire hazard; possible loss of buoyancy due to gas bubbling through the water column was discussed, and though catastrophic, is thought to be very unlikely. All gas hazards increase with decreasing water depth and/or increasing sediment overburden. PPSP is alert to direct signs of gas such as: 1) bottom-simulating reflectors (BSRs) with a phase reversal, suggesting a downward progression from clathrates to a sealed zone of free gas; and 2) isolated amplitude anomalies ("bright spots") that may indicate localized gas pockets. PPSP is very unlikely to approve drilling through a BSR unless it can be shown that the formation immediately beneath this feature is a poor reservoir or has no local closure. Bright spots are usually limited in extent, and moving a drill site a short distance off the seismic feature rarely decreases the chance of meeting the original drilling objectives. In a region of known or likely faulting, the possibility of vertical gas migration must be guarded against, and hence even gas buildups below the intended total drilling depth are given careful consideration.

The risk of hot pore water flashing to steam during or after ascent to the sea surface was discussed. Although this hazard is recognized, PPSP has not yet formed an assessment.

SSP CONSENSUS - SSP points out that BON1 (Leg 126) and several programs outlined in the CEPAC prospectus anticipate drilling in high-temperature environments. The chance of steam flashing ought to be evaluated by PPSP. In addition, how high temperatures could affect the BHA and logging equipment should be considered by ODP/TAMU engineers and the ODP/L-DGO logging group.

Dave stressed that PPSP members should be presented with a regional tectonic summary during the review session. This report should include relevant industry experience in the area, e.g., proximity and results of wells, heat flow studies, etc. Structure and isopach maps are always helpful, and are especially important in high-risk, continental margin areas. Because no site can be drilled if not first approved by PPSP, Dave stressed that all site proponents should arrive at the review session prepared to present all of their back-up as well as primary sites. Furthermore, he urged that proponents seek permission to drill to depths slightly beyond conservative calculations of

target depths, should the unexpected occur and targets picked in travel time turn out to be at greater true depth than anticipated.

Rob Kidd asked if PPSP would consider developing a matrix, i.e. checklist, of items required for safety review. It was pointed out that despite the fact that a description of the safety review appears in the Sept. '85 issue of the JOIDES Journal, site proponents often become aware of these guidelines too late in the process to assemble the requested information properly. Dave thought that an early distribution of a safety checklist was worth considering, and will bring it up for discussion at the next meeting of the PPSP. Rob continued by noting that much of the chore of preparing a safety review package used to be taken up by the ODP staff scientist assigned to that particular Leg, and that this "watchdog" relationship provided an effective means of following through on the iterative nature of most safety reviews.

SSP CONSENSUS - Regrettably, few site proponents become aware that safety review guidelines exist (JOIDES Journal, Sept., 1985; expanded March, 1986; revised summer, 1988 but as yet unpublished) in time for these advisories to help them prepare survey and drilling packages. SSP requests that PPSP consider various means of "getting the message out". One possibility is to include these guidelines of safety items (with a checklist to be completed by the proponent?) along with the package delivered to potential proponents by the JOIDES office.

ACTION - At the upcoming PPSP meeting in Hawaii, Laurent d'Ouzouville will present SSP's request that JOIDES distribute the most current safety guidelines to the site proponents of all new proposals at the time they are received at the JOIDES office.

F. CEPAC (Steve Lewis)

Steve Lewis reiterated the statement made by PCOM at its last meeting that at this stage, many of the drilling programs in the July '88 CEPAC prospectus cannot be evaluated yet by SSP because: 1) survey data are in the process of being collected, or 2) absolutely no surveys are anticipated. Birger Larsen added that his reading of the prospectus revealed that the adequacy of existing survey packages was sometimes exaggerated.

Site-by-site discussion of each of the 14 proposed legs was tabled until the evaluation by each SSP watchdog.

G. WPAC (Heinrich Meyer)

1) Leg 124

Heinrich Meyer reported that at the April '88 WPAC meeting, he and Greg Moore examined recently acquired *Darwin* profiles and judged them inadequate for imaging basement at BANDA 1. Heinrich described the series of S. China Sea sites (SCS 10, 10a, 10b, 11) that have since been dropped from the schedule by PCOM due to the uncertainties of gaining permission to drill in territorial waters. The WPAC request of PCOM to expand Leg 124 to 60 days has been approved; the remaining priority sites include BANDA2, CS1 and one of the three equivalent sites SS1, 2 or 3.

2) Leg 125

Planned sites include BON6, MAR3a and 3b; BON7 is an alternate. These comprise a 56 day Leg.

3) Leg 126

Planned sites include BON1, 2, 5a and 5b for a 58 day Leg. Bottom hole temperatures at BON1 are expected to be between 50° and 300° C.

4) Leg 127

Planned sites include J1b, d, e and J3a to make a 56 day Leg. Relocation of J1d (recommended by SSP in March, 1988) is difficult to achieve and still meet objectives. Additional surveying is scheduled in 1988 and early 1989 that may be of help. J3a has been relocated to J3b as requested by SSP.

5) Leg 128

A 41-day Leg is planned to drill sites J2a and JS2; 10 days are allotted to return to J1b to deploy the downhole seismometer and conduct an oblique seismic experiment.

6) Leg 129

Sites NKT1 and 2 will be drilled on a 57 day Leg. An offset vertical seismic experiment is planned, pending the availability of a second ship.

H. Recent Co-chiefs reports

1) Leg 119

Birger Larsen summarized results of Leg 119 drilling on Kerguelan Plateau and Prydz Bay. The items discussed relevant to feedback for SSP were two: 1) Alan Cooper arrived at the ship with a re-processed version of Line 21 across Prydz Bay, though this version has not been deposited in the Data Bank; and 2) calculations designed to place core recoveries on the available reflection profile were based on unreversed sonobuoys deployed and reduced on the *Resolution* during the pre-site surveys. Because of depths and strategies imposed by safety considerations, these measurements were especially critical for the success of the Leg.

ACTION - Carl Brenner to write to Alan Cooper requesting a copy (on reproducible substrate if possible) of the version of the seismic line he feels is most useful to the interpretation of drilling results in Prydz Bay.

2) Leg 121

John Peirce summarized results of Leg 121 drilling on Broken Ridge and the Ninetyeast Ridge. He reported on two experiences that underscore the importance of accurate site survey data being passed along to the drilling engineers. First, a serious underestimate of drilling times at Broken Ridge resulted in the need to re-prioritize strategies while on-site. Second, the difficulties in locating and re-entering the mini-cone deployed at 752 strongly suggested that the mini-cone buried itself in soft surficial sediments. In previous site surveys, core samples were considered essential only if a standard re-entry cone and casing were anticipated.

ACTION - Jack Baldauf will assemble the history of mini-cone deployment, noting especially performance in various surficial sediment types, and will relay findings to both the TAMU engineers and to Greg Mountain.

Shipboard paleomagnetics of double HPC's deployed at Site 758 underscored the value of this procedure: although the recovery of each HPC by itself appeared good, there were differences in the down-hole reversal patterns of each one. By staggering the penetrations by 1/2 of a core length, gaps introduced at section boundaries, pipe couplings, or successive coring attempts were

eliminated. The combined paleomag record was complete back to the upper part of Chron 6, and showed that the recovery of each HPC by itself was approximately 80%.

3. SITE SURVEY ASSESSMENTS OF SCHEDULED LEGS

A. Leg 124E (Jack Baldauf)

Jack Baldauf reported on the progress of planning for the engineering test leg. Four sites are scheduled: ENG1 - to test the a) diamond coring system, b) pressure core sampler, c) Navidrill core barrel, and d) latest extended core barrel; ENG2 - old Site 453, to test logging capabilities; ENG3 - old site 452, to assess recovery in alternating hard/soft lithologies; and ENG4 - to evaluate performance and limitations in reaching ultra-deep targets. The locations of all but ENG1 have been determined; surface currents pose a concern at this latter site in the Luzon Strait. Fred Duennebier recently collected survey data across Seamount 853 near Guam, and volunteered to make this data available to ODP/TAMU for their evaluation as a possible re-location for ENG1.

ACTION - Fred Duennebier will send to Jack Baldauf data recently acquired on Moana Wave across Seamount 853 to provide TAMU the opportunity to re-locate ENG1.

B. Leg 125 (Fred Duennebier)

Site survey matrix is found in Appendix G1. In contrast to the report at the last SSP meeting, no piston cores are available at BON6; if this is to be a re-entry site, the ODP/TAMU engineers must be alerted to this inadequacy.

ACTION - Jack Baldauf to inform ODP/TAMU engineers of the lack of piston cores in the vicinity of potential re-entry site BON6.

Patty Fryer participated in *ALVIN* diving on the seamount that is to be drilled at MAR3. She reported serpentinite sands and unrecoverable, interstitial "fluffy" material. No information has yet been made available to SSP with regards to a piston core scheduled to have been taken at this location during the recent *Sonne-57* cruise.

ACTION - Heinrich Meyer will search for the record of a piston core taken near MAR3 during the recent Sonne 57 cruise, and will forward a report to Jack Baldauf.

SSP CONSENSUS - Available information suggests there is little sediment cover at MAR3, and while SSP points out the likelihood of this being an effectively "bare-rock" site, unsupported spud-in may be possible.

C. Leg 126 (Fred Duennebier)

The only remaining SSP issue pertaining to this Leg involves the concern over local complexity of heat flow values in the vicinity of BON1. Ideally, much could be learned by drilling in a zone of known hydrothermal upwelling, but this may pose concerns that must be reviewed by ODP/TAMU engineers and/or PPSP. A letter from Marc Langseth (5 June, 1988; Appendix E1+2) summarized what was known prior to a transect of measurements across BON1 conducted during the summer by GSJ. A telex reporting preliminary results of the latter is in Appendix E3+4.

SSP CONSENSUS - Survey data is adequate for drilling at BON1. However, heat flow values obtained by GSJ between 30° 48' N and 30° 55' N near 139° 50' E indicate large variability, suggesting intensive hydrothermal circulation. There exists the possibility of encountering high temperatures within upwelling zones, possibly in the immediate vicinity of normal fault

scarps. SSP urges the proponents finalize recent measurements, incorporate them with previous data and with the known fault distribution, and discuss anticipated target depth temperatures with both ODP/TAMU engineers and with PPSP.

ACTION - Kiyoshi Suyehiro to coordinate the discussions of probable target depth temperatures at BON1 between site proponents, ODP/TAMU engineers, and PPSP. Correspondence is to be copied to Greg Mountain.

D. Leg 127 (Kiyoshi Suyehiro)

Site survey matrix is found in Appendix G3-5. New MCS profiles across two sites not yet approved by SSP were reviewed. The most recent lines are 8-second displays, complicating their comparisons with the older 7-second displays. Nonetheless, with crossing lines now available, survey data across Site J1d are adequate for drilling.

Site J1e, the complementary site to the fully approved Site J1b, was reviewed. Previously acquired MCS and recent GSJ seismic data intersect at the proposed drill site. Although the latter are single channel analog profiles, SSP feels they provide adequate three-dimensional control and approves Site J1e for drilling.

Seismic lines over the Okushiri Ridge do not as yet provide a clear image of basement. The primary objective at this site, J3b, is to recover the sediment-basalt contact and provide time constraints on the development of obduction and a new plate boundary within the northern Japan Basin. Two profiles were reviewed by SSP; a third, nearby MCS line was not. A strong, irregular reflector presumed by the proponents to be the top of obducted basement is visible on the E-W lines a few kilometers west of J3b. By contrast, this and many other reflectors are very difficult to identify directly beneath J3b due to the steep dip on this, the eastern flank of Okushiri Ridge. Furthermore, there is roughly 350 msecs of acoustic stratification beneath the presumed basement reflector that warrants further study.

ACTION - Greg Mountain will write to Ken Tamaki (on bitnet via Kiyoshi Suyehiro) requesting that as site proponent Ken Tamaki 1) analyze pertinent stacking and sonobuoy calculations for velocities that may resolve the ambiguous designation of basement at J3b; 2) deliver location maps of this and all Japan Sea sites showing MCS lines with shotpoints or common-depth-point annotations; and 3) attempt to unify the display scales of the various profiles critical to the proposed Japan Sea sites. Tamaki will be urged to bring these items with him to the October meeting of WPAC for discussion and deposit in the Data Bank.

ACTION - Carl Brenner and Greg Mountain will locate any relevant sonobuoy data in the vicinty of J3b contained in the L-DGO archives. Greg Mountain will review these findings, plus information delivered to the Data Bank by Ken Tamaki, and will forward an SSP comment on this site to PCOM .

Kiyoshi reviewed the status of the development of the downhole seismometer to be installed at J1b. Construction will be completed by March, 1989. The device will include a digital, event-driven detector able to identify events of magnitude 5 or more within 10° of the site, and greater than magnitude 7 from any distance. Events as long as 30 minutes with periods from 0.1 to 100 seconds will be digitized at 25 msecs and recorded on 60-megabyte tapes. A ship will return to the site roughly every six months to drag for and retrieve the submerged recorder, change the tape, and re-deploy. Possible future developments include either telemetering to shore via a floating radio transmission buoy, or direct communication to shore via a fiber optic cable.

E. Leg 128

Site survey matrix is found in Appendix G6. Sites J2a and JS2 were approved by SSP at its last meeting.

F. Leg 129

Sites NKT1 and NKT2 were approved by SSP at its last meeting.

4. SITE SURVEY ASSESSMENTS OF OTHER DRILLING PACKAGES

A. WPAC

1) North East Australian Margin (Peter Davies)

As a proponent of the NEA drilling program, Peter Davies was invited to present the site survey package to the Panel. He opened by thanking SSP and the JOIDES office for the opportunity to attend the meeting. He provided the panel with several references describing the regional tectonic history, which he then summarized.

Three physiographic features dominate the study area: the Great Barrier Reef, Queensland Plateau, and Marion Plateau; Queensland Trough separates the first two, and Townsville Trough separates the latter two. While the actively growing reefs of the Great Barrier region extend across one of the world's largest reef belts, actual reef rocks are no more than 200 m thick; most of the sediment below 200 m sub-bottom accumulated before northward drift of the Australian plate brought the region into tropical climates favorable to reef growth. Marion Plateau is an offshore extension of the Great Barrier reef that is largely too deep to support framework reef buildup. Queensland Plateau is the world's largest carbonate platform; about 20% of it is modern reefs.

No exploratory wells have been drilled within this region; age of seismic units as a result is poorly controlled. The Australian Bureau of Mineral Resources has collected a considerable amount of high quality survey data. From this has been developed a drilling program based on 13 proposed drill sites, all of which are crossed by intersecting MCS lines. From 3 to 9 reflectors have been traced in the vicinity of each proposed site, and structure contour maps (in travel time) have been produced for each.

The proposed drilling program is made up of two transects of sites. An E-W series (NEA1-NEA6) from the margin of Great Barrier Reef across Queensland Trough to Queensland Plateau, will evaluate relationships between sea level change and cycles of reef growth and destruction. A second series of holes (NEA8-NEA14) will extend these objectives across a N-S transect between Queensland and Marion Plateaux to evaluate the influence of paleolatitude on these processes. Furthermore, studies of carbonate diagenesis and the development of a deep boundary current will be addressed along this proposed transect.

SSP CONSENSUS - An exceptionally thorough data package across 13 NE Australia sites was presented to the Panel. SSP commends the proponents for their adherence to placing all sites at the intersections of MCS lines, and for their preparation of from 3 to 9 travel-time structure maps at every site. The data packages at all sites (NEA1-6 and NEA8-14) are approved.

The following are SSP comments. Concerns about possible closures on stratigraphic traps at several locations are probably addressable by moving locations a few kms, or by developing a specific sequence of drilling. Furthermore, alternate sites ought to be prepared. Closure within two or more sequences may force NEA8 to be moved a few kms. Deconvolution of the source signature could improve the clarity of all seismic lines seen by SSP, and would especially benefit the fine-scale acoustic stratigraphy at NEA 13 and 14.

SSP points out that although drilling times have not been calculated in great detail, the 54 operating days estimated by SOHP may be overly optimistic. Furthermore, this estimate is based on at least one site (NEA6) targeted to stop above a cleanly resolved, reachable, and presently

unsampled basement reflector that SSP feels PCOM or an advisory committee may consider a valuable goal.

2) Lau Basin (Lindsay Parson)

The Lau Basin drilling program prior to the Spring of 1988 had been built upon objectives derived from several survey cruises. Cooperation among the many proponents had led to the formation of the Lau Basin Working Group and to a multi-faceted and yet well-integrated set of objectives to be addressed at Sites LG1 through LG7. During initial reviews of these data, SSP flagged survey inadequacies that included: a) the need for a high-res seismic line near 18°45' S between 176° and 178° W and tied to the *Sonne* seismic grid; and b) side scan imagery of this same region.

In May of this year, the *Darwin* conducted a 22-day survey designed to meet the above survey shortfalls and to clarify the complex tectonic fabric of the central Basin. The insight gained from these new data has led to revisions in the tectonic models of the observed features, and has prompted additional site proposals (LG8 through LG10). Lindsay Parson, Chief Scientist on the recent *Darwin-33* cruise, was invited to present these findings to the Panel.

The mainstay of *Darwin-33* was 11 days of GLORIA surveying. This was matched by analog air gun seismic profiling, 3.5 KHz echosounding, magnetics, gravity and narrow-beam bathymetry. To this was added numerous dredges and piston cores collected during an 11 additional days.

The immediate objective of providing an E-W seismic line at 18°45' S was met. However, due to the relatively small air gun size, the complex interlaying of volcanoclastic sediments, pelagics, possible volcanic sills, and generally rugged terrain, clear images of basement were not recorded across all proposed sites located within sediment ponds. It is unlikely that any of these ponds are much more than 250 m thick, and uncertainties in this range should not pose a significant problem to estimating drilling times. To ensure that an adequate number of sites were available along this E-W transect, a new LG8 site was surveyed and added to potential targets.

The other goal of imaging the fabric of the central basin was met, perhaps even surpasssed; GLORIA uncovered such complexity that SSP is probably not alone in saying that a re-evaluation of objectives is called for. North and south Lau Basins appear to be very different from each other. Bright patches with a NW-SE grain near the intersection of Peggy Ridge and the Central Lau Spreading Center (CLSC) near 17° S suggest recent lava flows resulting from transtentional "leaks"; a RRR triple junction may be developing at this location. Based on the GLORIA records, bathymetry, and dredges from this and other cruises, it now appears that the CLSC constitutes the best defined propogating spreading center yet mapped with GLORIA; it terminates near 19° S where it then is offset eastward along instantaneous transforms. From there, subdued topography can be followed southwards along the Eastern Lau Spreading Center (ELSC) and connected to the Valu Fa Ridge. Between 20° and 21° S, bright patches on the GLORIA records suggest recent volcanic flows 100 km west of the ELSC, despite all other evidence pointing to Valu Fa as the presently active center in the south. Lindsay proposed that this western ridge is an extinct spreading center that jumped eastward sometime between 1 and 3 Ma. More work with regional magnetics is required to define it with precision, but a suture zone ought to be located between this location and the ELSC; sites (with alternates) straddling this axis were proposed as LG9 and LG10. The former would date and characterize the petrology of the oldest back-arc crust formed at the now-extinct axis; the latter would do the same for the oldest crust formed at the ELSC. Additional sites LG3 and LG6 were crossed, but the quality of the seismics is greatly below that of existing MCS lines.

SSP CONSENSUS - The discussion that followed the presentation of the new Lau Basin data clearly established that before SSP can evaluate the adequacy of the total survey package, a unified set of drilling objectives must be developed. The Lau Basin Working Group will be meeting for this purpose just before the upcoming WPAC meeting at L-DGO.

SSP recommendations of follow-up actions re: Lau Basin were as follows. The A-D conversion and digital processing of all seismics from *Darwin-33* is not thought to be worth the effort; the re-processing of key profiles across those sites remaining after the working group review, however, may be beneficial. More seismics, with 3.5 KHz and SeaBeam, however, are not only desirable, but possible as well: Jim Hawkins (Scripps) will be passing through the region on the *Washington* in 1989. Again after the working group deliberations, a request that Hawkins collect these kinds of data may be advisable.

ACTION - After the Lau Basin Working Group re-defines proposed objectives and drill sites, Lindsay Parson will finalize the Darwin -33 track, send it to Fred Duennebier who will then compose a letter to Jim Hawkins requesting seismics, 3.5 KHz and SeaBeam data be collected in the Lau Basin during his upcoming cruise on the Washington.

ACTION - After targets are re-focused by the Lau Basin Working Group, Lindsay Parson will expedite the A-D conversion and reprocessing of Darwin -33 seismic profiles across Lau Basin sites.

3) Vanuatu (Greg Mountain)

The Vanuatu site survey matrix is found in Appendix G10+11. All elements of the Vanuatu data package appear to be in good shape with one important exception: the velocity structure, depth to target horizon, anticipated hole conditions, and drilling strategy at DEZ2. This is the most important site of the Leg, and deserves careful attention.

One problem revolves around the uncertain velocity structure above the target décollement. Two of the site proponents, Mike Fisher and Jean-Yves Collot, calculate that interval velocities increase rather uniformly from a start of about 2 km/sec at the seafloor to about 3 km/sec just above the décollement. They arrive at this by dismissing what they interpret to be spurious velocity information that results from diffracted reflections. In contrast, Brian Taylor points out that to proceed cautiously, one must anticipate that velocities have been undercalculated. His estimates stress the higher range of possible velocities (from 3 to 3.6 km/sec), and these values necessarily require a reconsideration of likely drilling times at DEZ2.

SSP examined the data that Fisher + Collot used to arrive at their lower velocities, and concurred that although ambiguous, the weight of evidence favors their lower numbers. An additional test of the velocity structure was discussed, and will be requested.

ACTION - Greg Mountain will contact Fisher + Collot and request they prepare several semblance velocity profiles for CDP's 10 km to either side of DEZ2 on Lines 104 and 1022. Artifacts caused by diffracted arrivals ought to show variable rms velocities; values derived from true reflections should remain consistent across the several analysis points. These velocity graphs are to be made available to WPAC and to Greg Mountain.

In a letter to Mike Fisher (11 May 1988; Appendix F), Brian Taylor raised a second issue at DEZ2 concerning the structural character (regardless of velocities) in the accretionary prism above the décollement. These rocks probably contain fractured volcanics, derived either from the arc of the upper plate, or scraped off the downgoing plate. Hole conditions may be poor, and SSP points to the likelihood of having to set casing to keep the hole open to target depths that may range from 850 to 1200 m (depending on, again, the velocities of the rocks). No one has yet calculated drilling times at DEZ2 that incorporate casing the hole.

Considering the uncertainties at DEZ2, Taylor has proposed a drilling strategy that SSP feels represents a reasonable approach. It requires drilling DEZ2 first, before DEZ1 (the "calibration" site for recognizing unaltered rocks of d'Entrecasteaux Ridge). If hole conditions and/or projected depths make penetrating the décollement an especially lengthy task, then the Co-Chiefs will have an important decision to make. But in this scheme, they will not have already invested many days in

drilling the complementary "calibration" hole at DEZ1 that will be unnecessary if they decide to pull out of DEZ2 and push on to subsequent sites.

SSP CONSENSUS - Velocities at DEZ2 are reasonably interpreted by Fisher + Collot. However, due to the uncertainties of deriving interval velocities in this terrain of poor continuity of sub-bottom reflectors and diffracted arrivals, plus the reasonable chance that rocks above the décollement will be highly fractured, the drilling plan proposed by Brian Taylor is endorsed by SSP as a prudent strategy. SSP stresses that in this tectonic setting, penetration to the most optimistic target depth of 850 m may call for re-entry. Consequently, SSP points to the need for supplying the ODP/TAMU engineers with surficial sediment analyses. No piston cores are available, and SSP recommends that PCOM evaluate the need for this information and consider sending a request to New Caledonia for ORSTOM to collect piston cores at proposed Site DEZ2.

ACTION - For Vanuatu Site DEZ-2, ODP/TAMU (via Jack Baldauf) will provide to WPAC at their October meeting (with copies to G. Mountain and M. Fisher/J.-Y. Collot) a response on the drillng strategy, time estimates, and potential need for piston cores to achieve the site objectives, taking into account: 1) water depth of 2600m ; 2) range of likely penetrations from 800-1300m sub-bottom; and 3) possible occurrence of indurated and fractured volcanoclastic sediments.

ACTION - Depending on the outcome of the ODP/TAMU engineers' report and further discussions at the October meeting of WPAC, Laurent d'Ouzouville will notify PCOM of the lack of piston cores at DEZ2, a shortfall that could be met by requesting ORSTOM collect these samples.

4) Geochemical Reference Sites (Brenner and Mountain)

The three-hole geochemical reference site program discussed at the last PCOM meeting for inclusion in the 2nd year of WPAC was discussed by SSP and the following consensus was reached: 1) sufficient data exist for specifying the location of BON8, though this has yet to be done; 2) MAR4 (old Site 452 and upcoming ENG-3) is sufficiently well surveyed, but the chance for adequate drilling recovery in hard-soft layers is yet to be determined; and 3) survey data and specific site location for MAR5 have not been identified.

ACTION - Carl Brenner will contact Geochemical Reference Site proponent Jim Natland to offer his assistance in compiling data packages for the geochemical reference sites BON8, MAR4, AND MAR5.

B. CEPAC

In July, 1988, CEPAC published its first prospectus of 14 programs that it advocates for drilling after the second year of WPAC. Many of the programs are not yet mature enough for meaningful review by SSP. Nonetheless, SSP applauds the efforts of CEPAC to make these items available for timely identification of shortfalls that may exist in some surveys packages. Below is the list of the CEPAC programs as entitled in the prospectus, with brief SSP comments.

1) Flexure of the Lithosphere
   - not discussed at Swansea meeting
   - chronostratigraphic control is essential; pilot study based on paleomagnetics is forthcoming

2) Chile Triple Junction

- processing of MCS is complete through brute stack and constant velocity migration
- all other survey requirements have been met, and with the preliminary MCS profiles, tentative sites have been selected

3) Cascadia Accretionary Prism

A. Vancouver décollement

- crossing MCS lines are needed at proposed sites
- better three-dimensional definition of accretionary wedge is strongly recommended to optimize exact site locations

B. Oregon transect

- SSP urges that before the next MCS survey grid is collected that PPSP be consulted for its advice re: track spacing, acquisition parameters, extent of processing, etc.

4) Old Pacific Crust

- basement at recently surveyed Sites PIG3+4, EMB1+2 is inadequately imaged
- additional Sites PIG1+2 to be surveyed by *Suroit* in early '89; SSP stresses need for large volume airguns, sonobuoys and magnetics
- due to probability of encountering chert and/or volcanic sills, SSP suggests that chances of meaningful recovery AND successful drilling to basement should be re-evaluated after Navidrill test on 124E

5) Paleogene and Mesozoic Paleoceanography and Sea Level Seamount-Guyot and Subsidence Histories: Central Pacific

- site survey matrix in Appendix G12+13
- preliminary review of recently acquired SCS and 3.5 KHz underscore complex subsidence histories of guyots and need for integration with regional tectonic models
- data processing progressing, and proponents are aware of SSP requirements

6) Ontong-Java Plateau

- survey cruise scheduled for Nov, '88
- SSP urges the SCS grid consist of more than one dip line tie across steeply dipping flank to maximize chance of establishing good seismic correlations between shallow and deep survey areas

7) Neogene Paleoceanography in the Eastern Equatorial Pacific

- SSP urges proponents to continue search for better available seismics than are shown in prospectus; if none are found, then additional N-S hi-res SCS and 3.5 KHz profiles are needed

8) North Pacific Neogene

- Patton Seamount data package adequate
- SSP awaits the presentation of a mature data package for Sites Meiji 1+2 and NW 1, 3 + 4. SSP stresses the need for a dense net of SCS profiles that would ensure the maximum amount of intact Neogene at Meiji 1, and the minimimum contribution of slumps derived from the flank of Detroit Seamount at Meiji 2. The proponents ought to look into the possible availability of survey data collected during reconaissance of the U.S. EEZ.
- For each of the NW sites, the proponents ought to exhaust all available repositories of high-res SCS (including DSDP Leg 86 surveying). The small-volume air gun records shown in the prospectus (incorrectly identified as 3.5 KHz profiles) are inadequate.

9) The Bering Sea: High-latitude Record of Late Mesozoic to Cenozoic Climate and Tectonics

- not discussed at Swansea meeting
- survey package appears to be adequate from SSP perspective

10) Shatsky Rise, Anoxic Events
- SSP awaits the presentation of a mature data package for drilling on Shatsky Rise. Bottom current erosion and slumping have been important processes on the flanks of this feature, and optimal site location requires a dense net of high-res SCS to define the targets.

11) Lower Crust: Penetration of Layer 3
- Adequate data exist for deepening Hole 504B.

12) EPR Bare Rock Drilling
- Considerable work, based on a large data base, has been assembled to frame the major objectives. Nonetheless, specific locations have not been selected. The report of the EPR working group demonstrates that the likely proponents are aware of the need to integrate a complex array of survey technologies.

13) Hydrothermal Processes at Sedimented Ridge Crests
- not discussed at Swansea meeting

14) Early Stages of Hot Spot Volcanism: Loihi
- site survey matrix in Appendix G10
- adequte survey package lacking only in side-scan imagery from a deep-towed source

5. OTHER BUSINESS

A. Possible new vessel in the US fleet (Mountain)

Lamont-Doherty has won a bid to purchase the *M/V Bernier*, a survey vessel offered for sale by PetroCanada. A proposal for the US National Science Foundation to return to Columbia University the $10.7M purchase price is presently under review.

The impact on site surveying for JOIDES would be: a) the *Robert D. Conrad* would be retired this coming winter; b) there would be a 6-12 month gap in Lamont-Doherty's sea-going operations; c) a diversified, modern platform would be available near the beginning of 1990.

The strengths of the *Bernier* are several: 1) it is a 4 1/2 year-old vessel that could be acquired and, by way of cross-decking from the *Conrad*, equipped to conduct deep-sea research at less than 1/3 the cost of constructing and outfitting an AGOR-23 class vessel; 2) an ice-strengthened hull and 45-day endurance extend its operations to all regions in which the JOIDES *Resolution* can operate; 3) equipment crucial to the many operations of marine research would be installed, and include dynamic positioning, SeaBeam, unobstructed space along the rail for rigging a 30-m piston core, starboard and aft A-frames capable of faring cables from either of four winches, 2950 sq ft of main deck space plus another 3000 on decks A + B, 2800 sq ft of lab space and room for four 20-ft vans; and 4) compressors that provide 3150 SCFM of air (several times the *Conrad* at present), which could fire a 14-gun array (to be transferred from *Conrad*) at 2500 psi every 18 seconds.

Peter Davies mentioned that although BMR's *Rig Seismic* has dynamic positioning, it is rarely used while surveying. He felt that the need for steering a predetermined track was a far more common requirement than precise station-keeping, and this calls more for excellent navigation and seamanship than it does for computer-aided control of the engines.

B. Special survey requirements of bare-rock sites

Bottom photographs were not gathered during the site survey for Leg 118. As a result, 17 days of ship time were spent on the *Resolution* using the bottom-hole televiewer to locate a site suitable for setting the guide-base. The spectacular results at Site 735b, however, should not obscure the fact that with more "bare-rock" targets in the future, an assessment of survey criteria and SSP recommendations ought to be conducted. A small amount of time at the close of the Swansea meeting was devoted to this topic.

Bob Ballard and Hartley Hoskins of The Deep Submergence Laboratory at WHOI contacted Greg Mountain last Spring, inquiring about SSP's interest in "engineering-scale" surveys. Applications to such problems as locating sites for the bare-rock guide base were suggested by DSL as an item of common interest. Mountain suggested to Ballard that he submit to the JOIDES office an "idea proposal" outlining the capabilities of DSL instruments, and how they could be used for surveying ODP sites. Mountain also suggested that someone from DSL appear before SSP to describe the equipment that is under development.

No one from DSL traveled to Swansea, but Mountain outlined for the Panel the features of the DSL towed vehicle named Argo. The vehicle is connected to a 6 km conducting cable tethered to a vessel surveying at 1 to 2 knots. A standard 35 mm camera takes ASA 400, still B+W photos on command from the surface. Real-time monitoring of the bottom is maintained by low-light sensitive TV cameras (Silicon Intensified Target technology, or SIT) that have a gray-scale dynamic range of 50:1. These analog images are transmitted up the cable to a lab housed in a deck-mounted (i.e. portable) van. A third imaging system is a digital still camera based on charged couple device technology (CCD). This camera has a dynamic range of 10,000:1, and because the image is constructed digitally, a large number of enhancement techniques can be employed. Each image is nearly 1/2 megabyte of information, and consequently at19.2 Kbaud takes about 3 minutes to be transmitted up the cable. The result is that at 25 m above the seafloor, these digital images are reportedly comparable in quality to 35 mm photos that, due to lighting requirements and backscattering, are restricted to about 1/2 that height. The field of view of the CCD camera (about 200 sq. meters) at its operating height of 25 m is about the same size as it would be with a wide-angle (16 mm) lens on the photo camera at its 12 m height. The advantage of greater height is easier obstacle avoidance in rough terrain.

The two big advantages of Argo over standard camera vehicles are: 1) real-time TV monitoring allows for "hand-picked" CCD or 35 mm images; 2) bottom time does not have to be restricted by a need to return to the surface to re-load film. Another plus is the ability to place a variety of other sensors on the towed vehicle and transmit real-time information to the the ship. These others sensors include side-scan sonar, transmissometers, temperature probes, etc. Disadvantages include: 1) shipboard operations require as many as 5 people per watch, and together with costs for equipment refurbishment, insurance and shipping, a recent 21-day cruise on the EPR where Argo was used for 4 continuous days cost over $200K; and 2) the demands for deck space and over-the-side gear are not clear at this time, nor is it clear how portable the facilities actually are. Like any well-navigated bottom survey, an Argo grid would have to be navigated within a transponder net. If conducted in advance of an ODP drilling expedition, this net would probably be left in place to aid the location of the *Resolution* .

Discussion by SSP was limited by the time remaining at the end of the meeting. John Peirce relayed comments from Dick von Herzen that the televiewer surveying on Leg 118, though providing visual information, revealed nothing about composition, grain size or physical integrity of rock outcrops, each of which were crucial to setting the guide base. A picture may be valuable, but it would be doubly so if matched to an actual sample. Future developments of the Argo system may include a tethered sampling vehicle (Jason). It was also suggested by Fred Duennebier that while Argo may presently be the only system of its kind, similar ones are in various stages of development. It is clear that if bare-rock sites of the CEPAC program (e.g. East Pacific Rise or Loihi) remain high on the list of priorities that a need for detailed imaging and sampling of proposed sites may yet have to be done.

John Peirce reports that the Canadians at the Pacific Geoscience Centre are attempting to extend the depth range of an operational ROV to 2500 m. New data transmission and available towing cable will be tested over the nect year. Extra power is available on ROV for piggyback science packages such as an impact sampler.

SSP CONSENSUS - SSP encourages the Deep Submergence Lab to submit to the JOIDES office an "idea proposal" describing the capabilities of its towed vehicles, and suggesting applications to upcoming site surveys. The Panel stresses that the exceptional capabilities of this system may lie in some future

capacity to retrieve rock samples as well as to provide real-time, high-quality visual images.

C. Revising the SSP matrix

Survey standards requested by the SSP were discussed briefly. A revised matrix was developed (Appendix B1+2) that will be distributed to new drilling proponents by the JOIDES office. There are five changes worth noting: 1) "Side Scan Sonar" and "Photography" (formerly data categories 8 and 13, respectively) have been merged into one category (number 8) entitled "High Resolution Imagery"; 2) "Deep Penetration SCS" and "MCS" (categories 1 and 3) have been dropped as alternative requirements for environment E, "Ocean Crust with Thin Sediment Cover"; 3) "High Resolution SCS" (category 2) is upgraded from "desirable" to "vital" for "Aseismic Ridge, Oceanic Plateau or Seamount" (environment G); 4) "Deep Penetration SCS" and "MCS" have been added as "Desirable, but may be required in some cases" for "Bare-rock Drilling" (environment F) to accomodate deep crustal targets such as axial magma chambers; and 5) dredging (category 12) is now "Vital" for all "Bare-rock Drilling" environments. Other changes to the matrix are relatively minor. After discussion on the need for current meters in a survey package, it was decided to leave this category unchanged, but subject to further review at the next meeting.

D. Rotations, replacements, liaisons

John Perice will rotate off the Panel after this meeting. Keith Louden (Dalhousie) will be the new Canadian/Australian representative on SSP. All Panel members join Greg Mountain in thanking John for his superb leadership over the last several years, and wish him well in his future endeavors.

SSP CONSENSUS - Effective dialogue between SSP and JOI/USSAC has proven beneficial in the past, and has been maintained by Fred Duennebier's attendance in both groups. Fred has rotated off JOI/USSAC, and soon will depart SSP as well. It is hoped that his replacement to SSP can be drawn from the list of members presently serving on USSAC.

ACTION - Greg Mountain will contact Dave Scholl (USSAC chairman) for names of recommended USSAC members appropriate for replacement of Fred Duennebier to SSP.

CEPAC Liaison : Ann Arbor, Michigan, Oct. 17-19 -- Steve Lewis
WPAC Liaison : Palisades, New York, Oct 27-29 -- Carl Brenner

6. SCHEDULING OF NEXT MEETING

Fred Duennebier offered to host the next meeting. Possible locations are at HIG or at a remote University of Hawaii convention center. Availability of the center has to be determined.

ACTION - Fred Duennebier to arrange for reservation of remote University of Hawaii convention center for three days during the first two weeks of March, 1989.

Greg Mountain thanked Rob Kidd for the exceptional hospitality that he extended to the Panel members and guests. If only the weather for the next day's field trip were to be so warm.....

APPENDICES

A1 - A10	Ship Schedules
B1 - B2	Revised SSP matrix
C	Revised SSP mandate
D	SSP comments on Underway Geophysics
E1 - E4	Correspondance re: heat flow at BON1
F	excerpt of Taylor letter to Fisher, 11 May, 1988
G1 - G14	site survey matrices

RV/ENDEAVOR 1989 SCHEDULE

SCIENTIST	AREA	DATES	FUNDING	DAYS
TOWNSEND	G.OF MAINE	2-12 JAN	NSF(2)	11
BERTEAUX	W.N.ATL	15-21 JAN	ONR(2)	7
MCDOWELL	W.N.ATL	25-29 JAN	EPA(2)	5
SMITH	SEEP	21-30 MAR	DOE(1)	10
BISCAYE/BACON	SEEP	1-13 APR	DOE(1)/NSF(2)	13
ROSSBY	G.STREAM	16APR-14MAY	NSF(1)	28
WATTS	G.STREAM	17MAY-14JUN	NSF(1)/ONR(1)	28
WINN	GEORGES B.	18-23JUN	NSF(1)	5
TRANSIT	ICELAND	28JUN-8JUL	NSF(1)	11
JGOFS	ICELAND	10-19JUL	NSF(2)	10
DEMING	ICELAND	22JUL-12AUG	NSF(1)	22
WORCESTER	GNLAND SEA	15AUG-13SEP	NSF(1)	33
BERTEAUX	GNLAND SEA	16-24SEP	ONR(1)	10
TRANSIT	AZORES	26SEP-10CT	NSF(1)	6
BOYLE	AZORES	30CT-17OCT	NSF(1)	17
JGOFS(HONJO)	AZORES	20OCT-9NOV	NSF(2)	23
TRANSIT	NO.ATL	11-19NOV	NSF(1)	9

TOTAL 248 (202 FUNDED)

NSF 205
DOE 21
ONR 17
EPA 5

CRUISES HELD BUT NOT YET ACCOMMODATED:

WIMBUSH	W.N.ATL	AUG	NSF(2)	2	

FUNDING CODE: (1) FUNDED (2) SUBMITTED (3) TO BE SUBMITTED

R/V OCEANUS
1989 - Tentative Schedule

June 16, 1988

DATES	CHIEF SCIENTIST	PORT ARRIVING	CHARGE DAYS	FUNDING
		Bridgetown		
01/05 - 01/28	Richardson	Fortaleza	26	NSF (1)
02/01 - 02/20	Richardson	Las Palmas	23	NSF (1)
02/24 - 03/20	Roemmich/Hall	Bridgetown	29	NSF (1)
03/25 - 04/09	Stoecker	Charleston	19	NSF (1)
04/13 - 05/02	Joyce/Kelly	Woods Hole	22	NSF/NASA (2)
05/10 - 05/15	Weller/Butman,C.	Woods Hole	6	NSF (1)
05/19 - 06/03	Winn	Woods Hole	16	NSF (1)?
06/08 - 06/24	Zafiriou	Woods Hole	17	NSF (1)
06/29 - 07/12	Fuhrman	Woods Hole	14	NSF (1)
07/15 - 07/19	Purdy	Woods Hole	5	NSF (1)
07/22 - 07/24	Grassle	Woods Hole	3	NSF (2)
07/28 - 08/03	Berteaux/Jenkins	Woods Hole	7	NSF (2)
08/08 - 09/02	Watts, R.	Woods Hole	25	NSF (1)

09/06 - 10/09	Shipyard	Woods Hole		
10/10 - 10/23	Olson, R.	Woods Hole	14	NSF (1)
10/27 - 11/09	Fuhrman	Bermuda	15	NSF (1)
11/13 - 11/27	Sayles	Woods Hole	17	NSF (1)
11/30 - 12/04	Purdy	Woods Hole	5	NSF (1)
12/07 - 12/13	Wiebe	Woods Hole	7	NSF (1)
12/15 - 12/18	Grassle	Woods Hole	4	NSF (2)
12/21 - 12/22	Weller	Woods Hole	2	NSF (1)

TOTALS FOR 1989

276 days
NSF - 276
Funded - 247

R/V KNORR
1989 TENTATIVE SCHEDULE

01/01 - 09/15	REFIT AND STRETCH		OUT OF SERVICE	
09/16 - 10/06	Bryan	Jacksonville	23	NSF (2)
10/11 - 11/10	Bryan	Jacksonville	35	NSF (2)
11/15 - 12/15	Paull	Jacksonville	35	NSF (2)
12/18 - 12/23	Transit	Woods Hole	7	NSF

Total: 100 All NSF All unfunded

R/V ATLANTIS II
1989 TENTATIVE SCHEDULE

01/01 - 02/28	Maintenance	Woods Hole
03/01 - 03/01	JGOFS program	Madeira to Reykjavik
06/30	End JGOFS work	Woods Hole
07/01	Resume ALVIN operations with loading submersible on board, sea trials, certification dives and transit to first site in ATLANTIC.	
12/88	Drydock ATLANTIS II	

SHIP OPERATING SCHEDULE 1989
R/V MELVILLE

Cruise Period	Area and Objectives	Chief Scientist	End Port	Agency Days
12/04-01/12	HYDROS LEG 2		(30 days in 1988)	
	South Atlantic Ventilation Experiment	Smethie	Capetown	NSF-44
01/17-03/01	HYDROS LEG 3			
	SAVE	Smethie	Montevideo	NSF-49

			or Rio	
03/07-04/15	HYDROS LEG 4			
	Long Line Phys.Oc.	McCartney/Talley	San Juan	NSF-45
04/19-04/28	HYDROS LEG 5			
	Reentry experiment	Orcutt/Spiess	Jacksonville	APL-10
05/01-06/03	HYDROS LEG 6			
	Benthic biology	Williams/Druffel	Jacksonville	NSF-37
06/07-07/07	HYDROS LEG 7			
	Reentry experiment	Orcutt/Spiess	Jacksonville	APL-33
07/08	To shipyard for refit/overhaul ??			
July 89--April 90	OVERHAUL/REFIT			

SHIP OPERATING SCHEDULES 1989
R/V THOMAS WASHINGTON

Cruise Period	Area and Objectives	Chief Scientist	End Port	Agency Days
12/30-01/09	Seismic survey	T. Shipley	Majuro	NSF- 9 F
01/09-01/16	Transit		Suva	NSF- 9 F
01/21-01/28	SeaBeam/SCS	J. Hawkins	Tonga	NSF- 8 F
01/29-02/23	SeaBeam/Dredging Lau Basin	J. Hawkins (one day gained on dateline)	Pago Pago	NSF-30 F
02/25-03/13	Transit			NSF-10 F
	Transit			Navy- 1 F
	Water Sampling	D. Keeling	Honolulu	NSF- 7 S
03/14-03/17	SeaMarc II installation		Honolulu	
03/19-03/31	SeaBeam/SeaMarc Survey	D. Epp	Honolulu	Navy-14 F
04/03-05/13	Benthic Biology	K. Smith	San Diego	NSF-43 F
05/14-07/30	BIENNIAL OVERHAUL		San Diego	
07/31-08/24	Topographic effects Fieberling Guyot	Lonsdale/ Haury et al	San Diego	Navy-25 F
Schedule A				
08/30-10/06	SeaBeam, dredging	R. Batiza/ J. Hildebrand	Manzanillo	NSF-40 S
10/11-11/12	SeaBeam, dredging East Pacific Rise 8N	J.Bender/ C.Langmuir	Acapulco	NSF-37 F
11/15-11/22	transit		Guayaquil	NSF- 8 S
11/25-12/25		J. Orcutt/ R. Harding	Easter Is.	NSF-34 S
12/29-01/28		J. Orcutt/ R. Harding	Guayaquil (+ 8 in 1990)	NSF- 4 S
Schedule B				
08/30-09/28	SeaMARC	Hilde	Manzanillo	NSF-31 S
10/02-11/03	SeaBeam, dredging East Pacific Rise 8N	J.Bender/ C.Langmuir	Acapulco	NSF-37 F
11/06-11/16	Transit		Easter Is.	NSF-12 S
11/20-12/25	SeaBeam/dredging	Schilling	Easter Is.	NSF-40 S
12/30-01/30	SeaBeam/gravity/dredging	Winterer	Papeete (+ 31 in 1990)	ONR- 4 S
Schedule C				
08/30-10/02	SeaBeam	Hayman/Fornari	Manzanillo	NSF-36 S
10/07-11/08	SeaBeam, dredging East Pacific Rise 8N	J.Bender/ C.Langmuir	Acapulco	NSF-37 F

11/11-11/21	Transit	Easter Is. NSF-12 S
11/25-12/29	SeaBeam/SeaMARC studies Lonsdale	Easter Is. NSF-39 S
01/03-02/03	SeaBeam/gravity/dredgingWinterer	Papeete

Agency	Funded	Proposed	Total	Unsched.	Total
NSF	146	94	240	187	427
ONR	40	0	40	35	75
Total	186	94	280	222	502

SHIP OPERATING SCHEDULE 1989
R/V MOANA WAVE

TENTATIVE

PORTS	DATES	PROJECT TITLE AREA OF OPERATION	NO. DAYS REQUESTED	STATUS
HONOLULU HONOLULU	01 JAN 15 JAN	MAINTENANCE	15	N/A
HONOLULU GUAM	16 JAN 29 JAN	TRANSIT	15	NSF(F)
GUAM KWAJALEIN	02 FEB 26 FEB	10oN TRANSECT (BRYDEN)	28	NSF(F)
KWAJALEIN HONOLULU	02 MAR 26 MAR	10oN TRANSECT (BRYDEN)	27	NSF(F)
HONOLULU RODMAN	03 APR 12 MAY	10oN TRANSECT (BRYDEN)	41	NSF(F)
RODMAN CRISTOBAL	16 MAY 23 JUN	SeaMARC II CARIB PLATE (MANN)	42	NSF(F)
CRISTOBAL RODMAN	27 JUN 04 AUG	SeaMARC II-COLUMBIAN MARGIN (BREEN)	42	NSF(F)
RODMAN RODMAN	05 AUG 25 AUG	MAINTENANCE	19	N/A
RODMAN GALAPAGOS	26 AUG 30 AUG	TRANSIT	07	NSF(S)
GALAPAGOS EASTER IS.	03 SEP 13 OCT	SeaMARC II-GALAPAGOS HOTSPOTS (DUNCAN)	44	NSF(S)
EASTER IS. TAHITI	17 OCT 21 NOV	SeaMARC II-JUAN FERNANDEZ MICROPLATE (LARSON)	39	NSF(S)
TAHITI HONOLULU	25 NOV 22 DEC	SeaMARC II-LINE IS SEAMOUNT (KEATING)	30	NSF(S)

OPERATING DAYS 315

R/V ROBERT D. CONRAD
Operations Schedule: 1989
ATLANTIC PLUS PACIFIC OPTIONS SCHEDULE

Cruise Period	Area and Objectives	Chief Scientist	End Port	Agency, Days Status
12/03/88- 01/07/89	27-32N MAR Sea Beam	Purcy	Azores	NSF-35-F
01/11/89- 01/31/89	22N MAR MCS-SB	Detrick/ Mutter	Fortaleza	NSF-14-F JOI- 3-F NRL- 3-F
02/04/89 03/06/89	Eq Atl Sea Beam, Drage	Fleming	Fortaleza	NRL-30-F
03/10/89 03/17/89	Open		Barbados	NSF- 3-F NRL- 4-F
03/21/89- 04/24/89	22N MAR HF, Cor	Langseth	San Juan	NSF-34-F
04/28/89 05/02/89	Open		Panama	4
	**********			
OPTION A:				
05/04/89 05/23/89	Open		Papeete	19
05/27/89- 07/01/89	Society Is MCS (2-Ship)	McNutt/ Mutter	Papeete	NSF-34-F
07/05/89 07/24/89	Open		Panama	19
07/28/89 08/05/89	Open		New York	8
08/10/89 08/20/89	Hudson River MCS, SCS	Diebold/ Bond	New York	10
	**********			
OPTION B:				
05/04/89 05/28/89	Open		S.Fran- cisco	14
06/01/89 06/18/89	Oregon Margin MCS	Kulm/ Moore	S.Fran- cisco	NSF-17-F
06/21/89 07/04/89	Open		Panama	14
06/08/89 07/16/89	Open		New York	8
07/20/89 07/30/89	Hudson River MCS, SCS	Diebold/ Bond	New York	10

NERC RESEARCH SHIPS PROGRAMMES 1989/90

Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
3 10 17 24	01 08 15 22 29	05 12 19 26	03 10 17 24 31	07 14 21 28	04 11 18 25	02 09 16 23 30	06 13 20 27	04 11 18 25	01 08 15 22 29	05 12 19 26	05 12 19 26
RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin	RRS Charles Darwin
10–14 VALPARAISO 38 Price *Edinburgh* Geochemistry Off Peru	10–13 BALBOA 39 Sinha *Cambridge* Geophysics E Pacific Rise	14–18 BALBOA 40 Westbrook *Birmingham* Geophysics Off Colombia	18–20 BALBOA Passage	30–02 WHOI 41 Hogg *WHOI* Physics NW Atlantic	24–27 WHOI Passage 08–15 BARRY 42 Saunders *IOSDL* Physics NW Atlantic	09–13 TROON 43 Taylor + Smith *IOSDL UMIST* Physics NE Atlantic	15–18 TROON 44 Ellett *DML* Physics NE Atlantic	22–29 UK PORT Refit	03 US Barter or Charter		
RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	RRS Discovery	
01–06 BARRY 181 Pollard *IOSDL* Physics Azores	02–06 FALMOUTH 182 Fasham *IOSDL* BOFS NE Atlantic	06–09 TROON 183 Harris *PML* BOFS NE Atlantic	12–14 FALMOUTH 184 McCave *Cambridge* BOFS NE Atlantic	15–19 FALMOUTH 185 Rice + Pried *IOSDL A'deen* Biol. Physiol. Porc. Bight	18–21 LISBON 186 Tyler *Southampton* Biology Iberian Pen.	16–20 LISBON 187 Weaver *IOSDL* Geochemistry Iberian Pen.	14–17 MADEIRA 188 Searle *IOSDL* Geophysics Canary Basin	21 BARRY	Vessel Conversion (or Lay-Up or Charter)		
RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger	RRS Challenger
29–10–25 GY GY GY 49 50 5 Sur Burton Sur *So'ton* Chemistry	09–11–24–26 GY GY GY GY 52 53 Sur Reid Sur *PML* Sedim.	07–09–22–24 GY GY GY GY 54 55 Sur Joint Sur *PML* Biology	07–08–22–24 GY GY GY GY 56 57 Sur James Sur *POL* Physics	06–07–21–23 GY GY GY GY 58 59 Sur Hill Sur *UCNW* Physics	04–06–19–21 GY GY GY GY 60 61 Sur Reid Sur *PML* Sedim.	03–05–23–26–30 GY BARRY 62 Watson *PML* Physics	Refit	Charter or Lay-Up		27–01–31 BARRY TROON 63 Gordon+Ellett *DML* Biology Physics NE Atlantic	
Charter Ships	Charter Ships	Charter Ships	Charter Ships	Charter Ships	Charter	Ships	Charter Ships	Charter Ships	Charter Ships	Charter Ships	Charter Ships
	8 days Ellett *DML* Physics			8 days Ellett *DML* Physics							

Final Version (03 August 1988)

This programme is provisional, subject to Council approval in September 1988, and is therefore NOT for publication or wider distribution at this time.

A-6

S O N N E Operations-schedule 1988

Fahrt-Nr.	Charterzeitraum	Anfangshafen	Endhafen	Charterer	Fahrtbezeichnung
SO 55	15.04.88 - 31.05.88	Hong Kong	Okinawa	Uni Hamburg (IfG)	Okinawa Trog, Geophysik
SO 56	01.06.88 - 01.07.88	Okinawa	Okinawa	TU Clausthal	Okinawa Trog, Geologie/Geochemie
SO 57	02.07.88 - 11.08.88	Okinawa	Hong Kong	Uni Kiel	Philippinische See/ Marianen Rücken
SO 58	12.08.88 - 30.09.88	Hong Kong	Kota-Kinabalu	BGR	Südchinesisches Meer, Sulu See, Nordborneo
	01.10.88 - 22.10.88	Singapur		RF	Werftzeit
SO 59	23.10.88 - 01.12.88	Singapur	Honolulu	Uni Hamburg	Sedimentfallenbeprobung
SO 60	02.12.88 - 01.02.89	Honolulu	Panama	Uni Karlsruhe	HYMAS II
SO 61	02.02.89 - 03.04.89	Panama	Callao	Uni Hamburg	Umweltexperiment
SO 62	04.04.89 - 03.07.89	Callao	Valparaiso	BGR	Geometep 5
SO 63	04.07.89 - 01.09.89	Valparaiso	Callao	Uni Marburg	Hydrothermale Lagerstätten am EPR
SO 64	02.09.89 - 02.10.89	Callao	Callao	Uni Hamburg	Umweltexperiment
	03.10.89 - 24.10.89	Valparaiso		RF	Werftzeit
SO 65	25.10.89 - 23.12.89	Valparaiso	Tahiti	Uni Kiel	Midplate 2
SO 66	27.12.89 - 15.02.90	Tahiti	Fidji Inseln	TU Clausthal	Midpac 4
SO 67	16.02.90 - 30.04.90	Fidji Inseln	Fidji Inseln	BGR	Back-arc/Trainings-fahrt CCOP/SOPAC

FS METEOR Operations-schedule 1988

TABELLE 1 F S M E T E O R Fahrtplanung 1989/90 Stand: Mai 1988

Zeit	Fahrtabschnitt/ Endhafen	Aufgabe Arbeitsgebiet	Themen/Programm/wiss. Disziplinen	Koordinator	Fahrt-leiter
1989					
29.12. - 10.01.	M9/1 Funchal	östl. Nordatlantik	SFB 133	Zenk	Zenk
12.01. - 25.01.	M9/2 Praia	östl. Nordatlantik	SFB 133	Zenk	Müller
25.01. - 16.02.	M9/3 Dakar	östl. Nordatlantik	SFB 133	Zenk	Müller
19.02. - 16.03.	M9/4 St.Cruz de Tenerife	östl. Nordatlantik	SFB 133	Zenk	Wefer
19.03. - 27.04.	M10/1 Pt.Delgada	Zentr.Nordatlantik	"Plankton 89"	Zeitzschel	Zeitzschel
27.04. - 12.06.	M10/2 Reykjavik	Zentr.Nordatlantik	"Plankton 89"	Zeitzschel	Lenz
15.06. - 12.07.	M10/3 Reykjavik	Zentr.Nordatlantik	"Plankton 89"	Zeitzschel	Zeitzschel
15.07. - 31.08.	M10/4 Hamburg	östl.Nordatlantik	BIOTRANS	Zeitzschel	Thiel
	W e r f t z e i t				
03.10. - 31.10.	M11/1 Rio Grande	Atlantischer Transect	SFB 133	Roether	Müller
02.11. - 21.11.	M11/2 Ushuaia	Drake Passage	Tracerozeanographie	Roether	Roether
23.11. - 21.12.	M11/3 Mar del Plata	Patagonischer Schelf	Fischereibiologie	Roether	Nellen
1990					
27.12. - 22.01.	M11/4 Ushuaia	Antarktische Halbinsel	Krill/BIOMASS	Roether	Sahrhage
24.01. - 26.02.	M11/5 Kapstadt	Zirkumpolarstrom	Tracerozeanographie	Roether	Roether
01.03. - 28.03.	M12/1 Pt. Delgada	südl. Ostatlantik	Partikelsedimentation	Wefer	Wefer
31.03. - 12.05.	M12/2 Pt. Delgada	Zentralatlantische Kuppen	Geophysik/Petrologie	Wefer	Weigel
15.05. - 19.06.	M12/3 Hamburg	östl. Nordatlantik	BIOTRANS/JGOFS	Wefer	Thiel

SHIP SCHEDULE (MG&G cruises) SEP. 30, 1988

JAPANESE RESEARCH VESSELS

R/V HAKUHO-MARU (new)	Jun 01- Jun 15	1989	test (K. Kobayashi)
(ORI, U. of Tokyo)	Jun 20- Jun 26	1989	test (A. Taira)
	Jul 03- Jul 26	1989	Nankai (J. Segawa)
R/V TANSEI-MARU	Nov 27- Dec 04	1988	Nankai (H. Fujimoto)
(ORI, U. of Tokyo)			
R/V HAKUREI-MARU	Nov - Mar	88/89	Antarctica
(GSJ/JNOC)			(NE Bellingshausen)
		1989	Okinawa Trough
		1989	Mariana Trough
		1989	Japan Sea
R/V TAKUYO	routine seafloor mapping / Philippine Sea		
(Hydrographic Dept. MSA)			
CHARTERED SHIP	to be determined		
DELP project (national lithosphere program)			

To: SSP
From: John Peirce
Date: Oct. 2, 1988
Subj.: Canadian ship schedule for 1989

There will be no firm schedule for Canadian ships until about late November. From conversations with people at the Atlantic and Pacific Geoscience Centres, the following plans seem likely to happen sometime next summer:

ATLANTIC

(for further info, contact Keith Manchester, 902-426-3411).

1. Deep seismic in the East Newfoundland Basin (C. Keen and I. Reid).

2. Giant Piston Core testing.

3. CSS HUDSON will be in a mid-life refit and is unlikely to be available until July, 1989. Schedule for the remainder of the summer is uncertain.

PACIFIC

(for further info, contact Earl Davis, 604-356-6453).

1. K. Rohr and M. Purdy (WHOI) - crustal structure of Juan de Fuca using bottom shot-bottom receiver system.

2. K. Rohr and H.P. Johnson (U. of Wash.) - Sea Marc I and Seabeam, west flank of Juan de Fuca - Fall, '88.

3. E. Davis - multiple penetration pore fluid gradient experiment. Juan de Fuca and possibly Gorda-Escanaba Tr. On same cruise Jim Franklin will use the Dalhousie rock drill.

4. L. Law - Active EM experiment on scaler of 100's of m, tentatively planned for 1990.

ODP OPERATION SCHEDULE

Leg	Objective	Departs Port	Departs Date	Arrives Port	Arrives Date	Port Days	Days at Sea
121	Broken Ridge & Nintyeast	Fremantle	5/06/88	Singapore	6/28/88	6/28-7/02	53
122	Exmouth Plateau	Singapore	7/03/88	Singapore	8/28/88	8/28-9/01	56
123	Argo Abyssal Plain & Exmouth Plateau	Singapore	9/02/88	Singapore	11/01/88	11/01-05	60
124	SE Asia Basins	Singapore	11/06/88	Manila	1/04/89	1/04-08	59
124E	Engineering I	Manila	1/09/89	Guam	2/15/89	2/15-19	37
125	Bon/Mar	Guam	2/20/89	Tokyo	4/18/89	4/18-22	57
126	Bon 2	Tokyo	4/23/89	Yokohama	6/19/89	6/19-23	57
127	Japan Sea I	Yokohama	6/24/89	Hakodate	8/20/89	8/20-24	57
128	Japan Sea 2	Hakodate	8/25/89	?	10/5/89		41
	- - - - - - - D R Y D O C K (14 D A Y S) - - - - - -					10/5-10/18	
129	Nankai	?	10/19/89	?	12/18/89	12/18-22	60
129E	Engineering II	?	12/23/89	?	1/21/90?	?	30?

Revised 9/5/88

SITE SU. .Y DATA STANDARDS

DRILLING ENVIRONMENT

		A	B	C	D	E	F	G
		Paleoenvironment or Fan (APC/XCB)	Passive Margin	Active Margin	Ocean Crust (> 400 m sediment cover)	Ocean Crust (< 400 m sediment cover)	Bare-rock Drilling	Aseismic Ridge, Plateau or Seamount
1	Deep Penetration SCS	(X)	(X)	(X)	X or 3			(X)*
2	High Resolution SCS	X	(X)	(X)	(X)	X	X	X
3	MCS & Velocity Determination		X	X	X or 1		(X)*	(X)*
4	Grid of Intersecting Seismic Lines	(X)*	X	X	(X)*	(X)	(X)	(X)*
5	Refraction		(X)*	(X)*	(X)*	(X)	(X)*	(X)*
6	3.5 KHz	X	X	X	X	X	X	X
7	Multi-Beam Bathymetry	(X)*	(X)*	X or 8	(X)	(X)*	X	(X)*
8	High Resolution Imagery	(X)*		X or 7		(X)*	X	(X)*
9	Heat Flow		(X)*	(X)*		(X), H	(X), H	
10	Magnetics & Gravity		(X)	(X)	(X)*	(X)*	X	(X)
11	Cores : paleoenvironment geotechnical	X	(X) R	(X) R	R	R,H		(X)* R
12	Dredging					(X)*	X	(X)*
13	Current Meter (for bottom shear)	(X)*	(X)*	(X)*			(X)*	(X)*

DATA TYPE

X = Vital
(X) = Desirable
(X)* = Desirable, but may be required in some cases
R = Vital for re-entry sites
H = Required for high temperature environments

11/10/88

SITE SURVEY DATA PACKAGE REQUIREMENTS

Site Survey data must be presented in a reasonable format. Data presented should include, at a minimum, a track line map at a working scale in the region of proposed sites (including enough data to correlate with seismic lines), bathymetric maps, and other data along track. In many situations, structural and isopach maps may be required for use by the various panels prior to approval for drilling. Digital seismic data should be processed to a reasonable level; the more processing the better. Data at each step of processing should be part of the data package.

Site Survey Panel

Mandate approved by EXCOM 15 September 1988. (Changes in 7.1.2 (a) and (b).)

7.1 Site Survey Panel: Mandate

7.1.1. The general purpose of the Site Survey Panel is to provide information and advice to the Planning Committee on the adequacy of and need for site surveys in relation to proposed drilling targets.

7.1.2. The Site Survey Panel is mandated to:

(a) Review site survey data packages prepared by the ODP Data Bank and to make recommendations as to their adequacy to the Planning Committee in light of the needs defined in mature proposals of the Detailed Planning Groups and thematic panels.

(b) Identify data gaps in proposed future drilling areas and to recommend appropriate action to ensure that either sufficient site survey information is available for pinpointing specific drilling targets and for interpretation of drilling results or that sites not be drilled.

(c) Provide guidelines for proponents and panels as to required site survey data and to examine the opportunities and requirements for the use of new technologies for surveying potential drill sites.

(d) Promote international cooperation and coordination of site surveys for the benefit of the Ocean Drilling Program, particularly between participating ODP nations' survey activities.

(e) Promote the lodging of all data used for planning drilling targets with the ODP Data Bank.

7.1.3. The Panel maintains liaison with the ODP Site Survey Data Bank Manager and the non-U.S. liaison at the JOIDES Office, who both attend SSP meetings.

UNDERWAY GEOPHYSICS

SSP comments in response to ODP/TAMU request

The SSP continues to be concerned about the shortcomings of underway geophysics on board the *Resolution*, and requests a report back from ODP regarding issues raised by Alan Cooper's letter following Leg 119 and Fred Dunnebier's comments thereto. Concerning seismics, what action is being contemplated with regard to:

(1) improvements to HIGHRES software;
(2) efforts to provide adequate documentation for HIGHRES software;
(3) tests of high speed streamers;
(4) deployment tests to optimize towing depth of streamers and sources; and
(5) possibility of using depth control birds on streamers?

On other matters as well, the Panel would also like to receive reports regarding: 1) the performance of the 3.5 and 12 KHz systems in deep water following installation of the new dome forward of the moonpool; and 2) the time standards presently on board--(e.g. is there a clock sufficiently accurate to track GPS on 2 satellites to navigate in the rho-rho mode with LORAN?)

The SSP urges TAMU to seriously consider that an underway geophysicist with experience on the Masscomp/Highres system be included on legs where significant amounts of geophysical data collection are planned. Experience has shown that geophysicists who sail in other capacities do not have time to work on underway data.

In terms of improvements to on-board recording, the SSP recommends as a first priority that a review be made of the manner in which navigation data are logged, plotted and integrated with underway geophysics. In particular:

(1) all navigation parameters (e.g. parameters indicating quality of sat fixes) should be logged; and

(2) there is a critical need for a system that plots in real-time all fix information (e.g. red for DR, blue for GPS, green for SATNAV, orange for LORAN) in <u>both</u> the geophysics laboratory and on the bridge. This would provide useful and identical perspective of navigation quality to both the scientists and the bridge in a timely manner that is not presently possible. HIG, LDGO and URI all have such systems in use with SeaBeam and SEAMARC mapping;

3) smoothed navigation plots should be produced routinely within 24-48 hours. This requires upgrading the level of on-board experience on how to do this as well as either: a) improving the efficiency of the current software, or b) bringing in new software from other institutions. It also means some reprioritization of technical responsibilities. If the real-time plots of fix information are available, then it should be a relatively easy matter for one of the on-board geophysicists to work with the marine technician to edit the original set of fixes into a "best guess" set of fixes;

(4) software should be available to plot any of numerous measurements along track, to any scale, and at many projections -- this is not a routine procedure at present;

(5) a normal output for quality control should be a strip plot of time, course, speed, water depth, and magnetics.

Implementing the preceding changes will require some investment of time by an ODP staff scientist as well as by the technical staff.

Improvements to the on-board seismic processing system are needed, but these should take a lower priority than the improvements to navigational processing systems discussed above. Several parts of the HIGHRES processing system simply do not work. The entire HIGHRES system needs to be reviewed, inadequacies corrected, and the documentation needs to be improved to a level easily understood by a first-time user.

The SSP compliments ODP for their efforts to improve the underway geophysical capability of the *Resolution* and hopes that similar improvements can be achieved in the future.

June 5, 1988

To: Greg Mountain

From: M. Langseth

Re: The thermal regime the Sumisu Rift near ODP proposed Site Bonin 1 (BON 1).

A question was raised at the last Site Survey Panel about Proposed Site Bonin 1 and whether high temperatures might be encountered during the drilling of this hole. It is located on an actively spreading rift and recent volcanism and high temperature hydrothermal activity are anticipated.

Yamazaki (1988) has just reported 11 heat flow measurements in the rift at about 31° N. The gradient measurements were made with relatively short 1.5 and 2 m probes. The volcanoclastic sediments in the rift made penetration difficult. At 6 of the 11 stations only 2 sensors were buried. The heat flow is generally high and variable the range is 38 to 700 mW/m^2.

The observations most relevant to assessing the thermal regime near BON 1 is a short E-W transect of closely spaced measurements (.5 to 1km spacing) across the most active zone of the rift at 30° 48' N. See Figure 5 from Yamazaki. This zone has the thickest sediment and the deepest basement. All of the values along this short section are high 124-700 mW/m2. The gradients range from 139 to 840 deg/km just below the sea floor, but probably decrease by 20 to 30% with depth due to the increase of conductivity. Nonetheless, over the active part of the rift temperatures could reach 300 to 400 °C at depths > 500 m.

The scale of the variability is not well determined, but appears to be on the order of the thickness of the sedimentary cover, which is somewhat greater than km below the transect. This suggests that the variation is due to hydrothermal circulation in the basement crust below the sediment and there may be a significant flow of water through the sediment especially along faults, as Yamazaki speculates. In a submarine hydrothermal regime very high

gradients and very low gradients can be found within several hundred meters of each other.

Yamazaki's measurement verify that the final locations of BON 1 holes should be based on a detailed 2-D survey of the sea-floor heat flow and porewater gradients of calcium and magnesium. This will allow BON 1 to be placed is on spot where the thermal gradient is low enough not to cause problems with drilling or downhole measurements, and assure that the drill holes locations relative to the hydrothermal circulation pattern are be known. We will learn a lot more from the hole if we know where we are drilling relative to the heat and fluid flow pattern.

I am sending a copy of this letter to Suyehiro to pass to his colleagues who will be making further heat flow measurements this year.

cc: Y. Suyehiro ✓
Brian Taylor
N. Pisias

Yamazaki, T. Heat Flow in the Sumisu Rift, Izu-Ogasawara (Bonin) Arc. Bull. Geol. Survey of Japan, 39(1) 1988.

*
* MOM SVP
* 3652570AIST J
* 3652570AIST J#
ENULM 202601F
TO M. YUASA, GEOLOGICAL SURVEY OF JAPAN

PCOM HAS REQUESTED THAT WPAC PROVIDE ALTERNATE PRIORITIES AND SITES IN THE EVENT THAT TEMPERATURES AT THE BON1 SITE ARE HIGH. WHAT WERE THE RESULTS OF YAMAZAKI'S HEAT FLOW PROFILE ACROSS THE BON1 SITE DURING YOUR AUGUST CRUISE ? PLEASE PROVIDE THIS INFO TO ME IN PARIS ASAP AS WELL AS TO SUYEHIRO WHO WILL ATTEND SSP IN EARLY OCTOBER.

REGARDS.
BRYAN TAYLOR
(202601 F ENULM)

>00113

35 12

* #
ENULM 202601F
* 270 0758
* 3652570AIST J
* TO DR.B.TAYLOR,
* WE SUCCESSFULLY MADE HEAT FLOW TRANSECT AT 30°55' NORTH BETWEEN 139,51.3' AND 54.2' EAST. TOTALLY EIGHT SITES WERE MEASURED AND HEAT FLOW VALUES WERE TENTATIVELY DETERMINED. RELATIVELY HIGH HEAT FLOW VALUE(HIGHER THAN 200 MILLIWATT PER SQUARE METER) WAS MEASURED AT WESTERNMOST SITE. THE OTHER VALUES ARE LOWER THAN 100 MW/M2. IF POSSIBLE, WE WILL ENTRUST DR.SUYEHIRO,ORI,WITH THE FINAL RESULTS.
* BEST REGARDS, MAKOTO YUASA,GEOL.SURV.JAPAN
* #
ENULM 202601F
<

(.... NB BON1 IS AT 30°55' 139°51.5 — low H.F.
BUT PREFERRED SITE BON 1A IS AT 139°51.5 — between high and low H.F. measurements.)

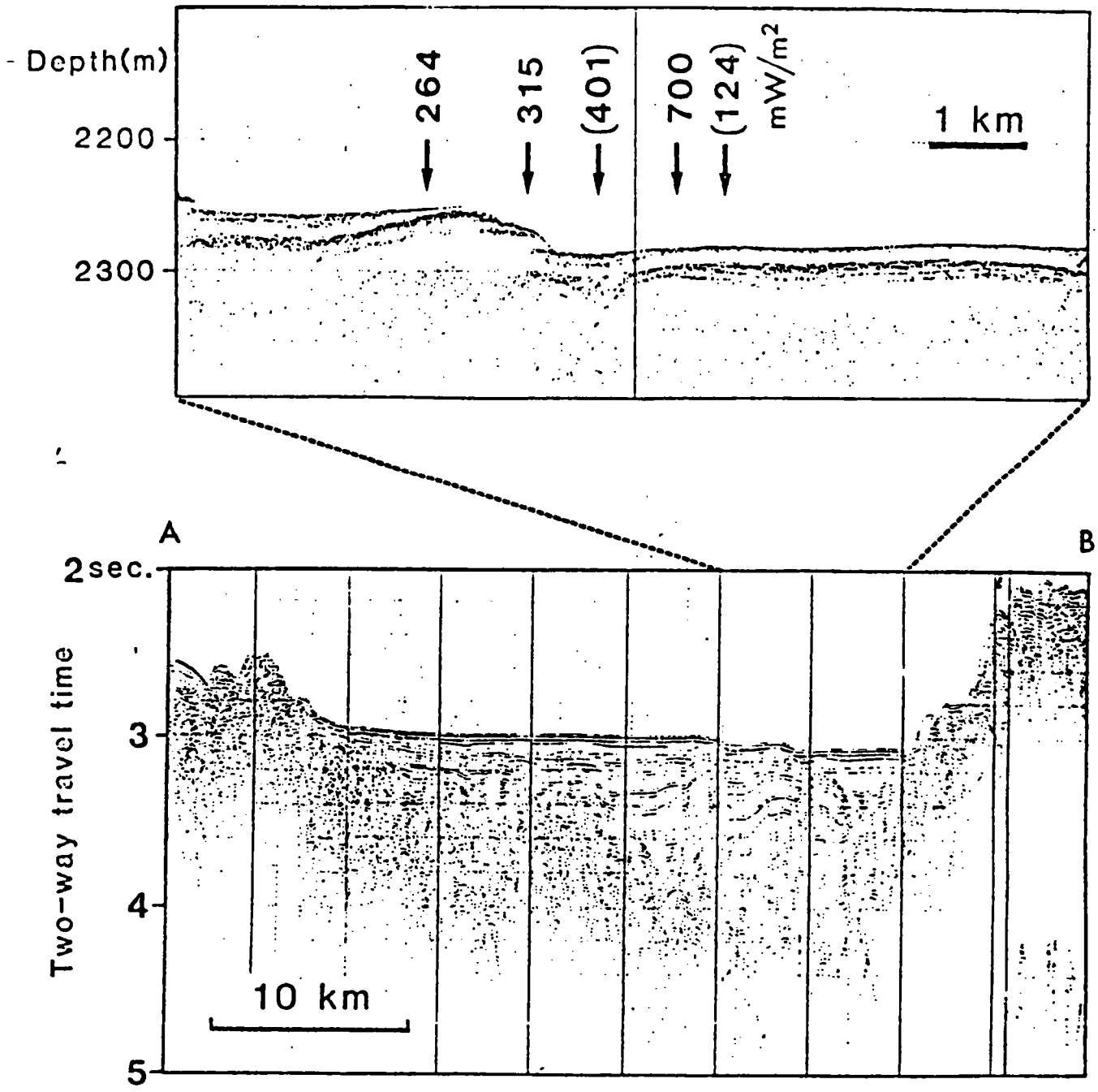


Fig. 5 Five closely spaced heat flow sites across an active normal fault. (Upper) Record of 3.5 kHz subbottom profiler and distribution of heat flow. Values in parenthese are less reliable. (Bottom) Seismic reflection profile. Location of the record is shown in Fig. 2. Several normal faults can be recognized on the profile.

From : Yamazaki, T. (1988), Heat flow in the Sumisu Rift, Izu-Ogasawara (Bonin) Arc. Bull. Geol.Surv. Japan, 39(1)

F

MEMO TO: Michael Fisher, USGS
Jean-Ives Collot, ORSTOM
FROM: Brian Taylor, WPAC Chairman
RE Vanuatu Drilling: DEZ-2

Clearly the forearc wedge on Line 104 is not an an accreted sedimentary prism. While I agree with you that fresh crystalline rock is not to be expected, I suggest that fractured and altered arc basement (whether Eocene or Miocene) is the most likely material to be drilled. To drill a 900m hole (50m into the lower plate) at penetration rates which may be only 2m/hr would require setting a re-entry cone and would take half a leg to complete. Although you resist this interpretation, all the panel members that have seen your data suggest that it is the most likely scenario.

In light of this , unless you can suggest a better alternative, I will make the following recommendation to WPAC, and with their concurrence, to PCOM: Keep the revised DEZ-2 site in the drilling plan, but allow a maximum of 16 days drilling plus logging DEZ-1 and DEZ-2. If arc basement is encountered at shallow depths at DEZ-2, and the penetration rate is slow the co-chiefs can determine whether or not to pull out early. DEZ-2 should be the first hole drilled so that if it encounters Miocene arc basement (i.e. no material transfer) then the reference site DEZ-1 should not be drilled and more time can be allocated to DEZ-2 or to remaining sites.

SITE SURVEY DATA SUMMARY : AREA: BONIN 1

TARGET SITE:	BON-1	BON-2	BON-5a	BON-5b	BON-6
latitude:	30 55 N	30 55 N	32 26 N	32 23 N	31 54 N
longitude:	139 53 E	140 00 E	140 47 E	140 48 E	141 06 E
region:	back-arc graben	back-arc horst	upper-slope basin	upper-slope canyon	outer-arc high
Environment:	E/F (REENTRY)	E/F (REENTRY)	E	E	E(REENTRY)
water depth:	2270m	1100m	2700m	3400m	2850m
sed. thickness:	850m	500m	>1500m	900m	950m
penetration:	870m	700m	950m	950m	1100m
TECHNIQUE:					
1. Single-Channel Seismic (a) high resolution	-	-	-	-	-
(b) deep penetration	GSJ (Geological Survey of Japan)	GSJ	HIG & JNOC	HIG & JNOC	LDGO
3. MCS, including velocities	JNOC (Japan National Oil Co.) also GSJ	JNOC	JNOC	JNOC	JNOC & LDGO
4. Crossing Seismic Lines or Survey Grid	HIG, Taylor, 1987 Site survey on R/V Fred Moore - all sites, also JNOC				
5. Seismic Refraction	profile at 32 N across arc, Honza and Tamaki, 1985				
6. 3.5 kHz	GSJ & HIG				
7. Multi-beam Bathymetry	SASS, Bay St. Louis, & SeaMARC II, HIG				
8. Side Scan Sonar a. Shallow Source	SeaMARC II, HIG				
b. Deep Towed Source	-	-	-	-	-
9. Heat Flow	Japanese data indicate high temp expected	GSJ			
10. Magnetics and Gravity	GSJ & HIG				
11. Coring A - paleoenvironment B - geotechnical	cores available (GSJ?), tech work needs to be done for reentry info.				
12. Dredging					NO CORES - must do for reentry
13. Photography	ALVIN dives, 1987				
14. Current Meter (for bottom shear)					

UPDATE: 10/13/88

SITE SURVEY DATA SUMMARY : AREA: BONIN 2

TARGET SITE:	BON-7	BON-8 (geochem. ref. site)	Mariana Ref Hole
latitude:	30 58 N	31 18 N	(near452) Langmuir & Natland
longitude:	141 48 E	142 54 E	?
region:	lower slope domes	Pacific Plate	
Environment:	E	G	G
water depth:	4650m	6000m	?
sed. thickness:	200m	500m	?
penetration:	600m	600m	?
TECHNIQUE:			
1. Single-Channel Seismic (a) high resolution	-	-	-
(b) deep penetration	GSJ see Taylor, p.9	GSJ	?
3. MCS, including velocities	-	LDGO	?
4. Crossing Seismic Lines or Survey Grid	July 1987, HIG, Taylor		?
5. Seismic Refraction	profile at 32 N acrosarc, Honza and Tamaki, 1985		-
6. 3.5 kHz	HIG	HIG	-
7. Multi-beam Bathymetry	SASS, Bay St. Louis	SASS, Bay St. Louis	-
8. Side Scan Sonar a. Shallow Source	SeaMARC II, HIG	-	-
b. Deep Towed Source	-	-	-
9. Heat Flow	-	-	-
10. Magnetics and Gravity	HIG	HIG	-
11. Coring A - paleoenvironment B - geotechnical	-	-	-
12. Dredging	ALVIN in area in 1987, but sites too deep for dive		-
13. Photography	-	-	-
14. Current Meter (for bottom shear)	-	-	-

UPDATE: 10/11/88

Sep 29, 1988

SITE SURVEY STATUS of the Proposed Japan Sea Sites

LEG 127

SITE J1b: *northern end of YAMATO BASIN*

	LAT	LON	W.D.	Penetration	Line/shot#
	40°11.4'N,	138°14.2'E	2861m	700m	DELP85-E #3851
ALT.	40°13.6'N,	138°14.7'E	2823m	680m	DELP85-E #3932
ALT.	40°17.6'N,	138°16.0'E	2892m	555m	DELP85-E #4096

Target **D**: Ocean crust w. thick sed. cover

Drilling plan: Hole A-APC/XCB to 600 m, Hole B-RCB w. re-entry cone

1	Deep SCS	YES (GSJ:J23)
(2)	High res SCS	NO
3	MCS & velocity	YES (DELP85-E; KH86-02:L10; KT88-09:107-110)
4	Cross lines	YES
5	Refraction	NEARBY
(6)	3.5 kHz	YES
(7)	Multi-beam	NO
(8)	Sidescan	NO
(9)	Heat flow	NEARBY
(10)	Mag & gravity	YES
11b	Core geotech	NO (TAMU approval)

SITE J1d: *northern end of JAPAN BASIN*

	LAT	LON	W.D.	Penetration	Line/shot#
	44°00.2'N,	138°52.7'E	3374m	700m	KT87-06-1 #543
ALT.	44°00.2'N,	138°57.5'E	3406m	825m	KT87-06-1 #674

Target **D**: Ocean crust w. thick sed. cover

Drilling plan: Hole A-APC/XCB to 650m, Hole B-RCB

1	Deep SCS	YES (GSJ:J8, J102)
(2)	High res SCS	NO
3	MCS & velocity	YES (KT87-06; KT88-09:101-103; JNOC88)
4	Cross lines	YES
5	Refraction	NEARBY
(6)	3.5 kHz	YES
(7)	Multi-beam	NO
(8)	Sidescan	NO
(9)	Heat flow	NEARBY
(10)	Mag & gravity	YES

SITE J1e: *southern YAMATO BASIN*

38° 36.7'N, 134° 32.6'E W.D. 2945m Penetr. 650m GSJ-J1e 08:53

Target **D**: Ocean crust w. thick sed. cover

Drilling plan: Hole A-APC/XCB to 600m, Hole B-RCB

1	Deep SCS	YES (GSJ: L38, GH88)

(2)	High res SCS	NO
3	MCS & velocity	YES (JNOC)
4	Cross lines	YES
5	Refraction	NEARBY
(6)	3.5 kHz	YES (GH88)
(7)	Multi-beam	NO
(8)	Sidescan	NO
(9)	Heat flow	NEARBY
(10)	Mag & gravity	YES

SITE J3b: *OKUSHIRI RIDGE(incipient obduction)*

	LAT	LON	W.D.	Penetration	Line/shot#
	42° 50.3'N,	139° 24.6'E	2298m	670m	KH86-2-6 # 805
ALT.	43° 00.0'N,	139° 22.2'E	2312m	990m	KH86-2-6 #2190

Target C: Active margins
Drilling plan: Hole A-APC/XCB to 620m, Hole B- RCB

(1)	Deep SCS	YES (GSJ)
(2)	High res SCS	NO
3	MCS & velocity	YES (KH86-02: L6; KT88-09)
4	Cross lines	YES
(5)*	Refraction	NEARBY
(6)*	3.5 kHz	YES
7	Multi-beam	NO
8	Sidescan	NO
(9)*	Heat flow	NEARBY
(10)	Mag & gravity	YES
(11)	Core paleo-environ	NO
(14)*	Current meter	NO

SITE J1a: *YAMATO BASIN*
39° 53.0'N, 137° 21.5'E W.D. 2530m Penetr. 610m JNOC10-1 #3371
Target D: Ocean crust w. thick sed. cover APC/XCB

1	Deep SCS	YES (GSJ)
(2)	High res SCS	NO
3	MCS & velocity	YES (JNOC)
4	Cross lines	YES
5	Refraction	NEARBY
(6)	3.5 kHz	YES
(7)	Multi-beam	NO
(8)	Sidescan	NO
(9)	Heat flow	NEARBY
(10)	Mag & gravity	YES

SITE J1c: *JAPAN BASIN*
40°20.13'N, 136° 54.1'E W.D. 2400m Penetr. 580m JNOC10-1 #3360
Target D: Ocean crust w. thick sed. cover APC/XCB SITE 302 of LEG31

1	Deep SCS	YES (GSJ:J23)
(2)	High res SCS	NO
3	MCS & velocity	YES (JNOC)
4	Cross lines	YES
5	Refraction	NEARBY
(6)	3.5 kHz	YES
(7)	Multi-beam	NO
(8)	Sidescan	NO
(9)	Heat flow	NEARBY
(10)	Mag & gravity	YES

LEG 128

SITE J2a: *Kita-Yamato Trough (paleo-rift)*

	LAT	LON	W.D.	Penetration	Line/shot#
	39°14.0'N,	133° 51.0'E	2085m	1610m	JNOC13-4 #7179
ALT.	39°07.6'N,	133° 58.6'E	1860m	975m	JNOC13-4 #6833

Target G: Aseismic ridges, oceanic plateaus/seamts
Drilling plan: Hole A-APC/XCB to 600m, Hole B-RCB w. re-entry cone

(1)* Deep SCS	YES (GSJ:L38)
(2) High res SCS	NO
(3)* MCS & velocity	YES (JNOC)
(4)* Cross lines	YES (V2815)
(5)* Refraction	NEARBY
(6) 3.5 kHz	YES
(7)* Multi-beam	NO
(8)* Sidescan	NO
(9) Heat flow	NEARBY (low about 75mW)
(10) Mag & gravity	YES
11b Core geotech	NO (TAMU approval)
(12)* Dredging	NO
(13) Photography	NO

SITE JS2: *OKI RIDGE (paleo-environment)*
37°02.2'N, 134°48.5'E W.D. 863m Penetr. 730m GSJ-JS2 #20480
Target A: Paleo-environment
Drilling plan: Hole A-APC/XCB/NCB, Hole B-APC to 120m

(1) Deep SCS	YES (GSJ: L35)
2 High res SCS	NO
(3) MCS & velocity	YES but no vel (GH86-4)
(4) Cross lines	YES
6 3.5 kHz	YES
(7)* Multi-beam	NO
(8)* Sidescan	NO
11a Core paleo-environ	YES
(14)* Current meter	NO

SITE SURVEY DATA SUMMARY : AREA: LAU BASIN

TARGET SITE:	LG-1	LG-2	LG-3 (W)	LG-3 (E)	LG-4
latitude:	18 38.2 S	18 37.2 S	22 09.9 S	22 09.8 S	22 22 S
longitude:	176 07.0 W	177 56.6 W	175 48.1 W	175 40.2 W	176 35 W
region:	CENTRAL LAU BASIN (youngest)	WESTERN LAU BASIN (oldest)	TONGA ARC PLATFORM	TONGA PLATFORM	VALA FA RIDGE (VFR)
Environment:	E/F re-entry	E - reentry?	D	D	E/F re-entry
water depth, m:	3539	2576	745	660	2400
sed. thickness, m:	-	300-450	400	400	50
penetration, m:	220	350	500	500	300
TECHNIQUE:					
1. Single-Channel Seismic (a) high resolution	Antipode (71), Papatua(86)	Antipode (71), Papatua(86) CD-33(88)			
(b) deep penetration	SIO	-	USGS?	USGS?	USGS?
3. MCS, including velocities	-	-	USGS & industry	USGS & industry	USGS,82,84-SP Lee, Line l8
4. Crossing Seismic Lines or Survey Grid	DESIRABLE	Antipode (71), Papatua(86) CD-33(88)	USGS? Papatua(86) CD-33(88)	USGS? Papatua(86) CD-33(88)	DARWIN-34
5. Seismic Refraction	-	SIO & HIG	sonobuoy (USGS?)	sonobuoy (USGS?)	DARWIN-34
6. 3.5 kHz	CD-33(88) SONNE-48(87) SONNE-35(84-85)	HIG, SIO,CD-33 SONNE-48(87) SONNE-35(84-85)	DARWIN CD-33(88)	DARWIN CD-33(88)	USGS,82,84-SP Lee, Line l8
7. Multi-beam Bathymetry	SIO, BGR SONNE-48(87) SONNE-35(84-85)	SeaBeam SONNE-48(87) SONNE-35(84-85)	NEEDED?	NEEDED?	SeaBeam BGR & IFRE-MER
8. Side Scan Sonar a. Shallow Source	DARWIN CD-33(88) GLORIA	DARWIN CD-33(88) GLORIA	DARWIN CD-33(88) GLORIA	DARWIN CD-33(88) GLORIA	desirable
b. Deep Towed Source		-	-	-	-
9. Heat Flow	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
10. Magnetics & Gravity	BGR, HIG, SIO Antipode (71), Papatua(86),CD-33	BGR, HIG, SIO,CD-33 Antipode (71), Papatua(86)	DARWIN CD-33(88)	DARWIN CD-33(88)	USGS,82,84-SP Lee, Line l8 mag
11. Coring a. paleoenvironmental b. geotechnical	SIO SONNE-48(87) SONNE-35(84-85)	TANGAROA(81) Imp. Col. Darwin (87,88) SONNE-35(84-85)	USGS? Tongatapu Isl.	USGS? Tongatapu Isl.	SONNE-35(84-85)
12. Dredging	SIO(Papatua) SONNE-35	BGR, HIG, SIO Antipode (71), Papatua(86)	USGS?	USGS?	BGR/USGS, Lee NAUTILE 1989
13. Photography	SONNE-48(87) SONNE-35(84-85)	SONNE-48(87) SONNE-35(84-85)	-	-	NAUTILE, 1989
14. Current Meter (for bottom shear)	-	-	-	-	-

UPDATE: 10/13/88

SITE SURVEY DATA SUMMARY : AREA: LAU BASIN

TARGET SITE:	LG-6 (W)	LG-6 (E)	LG-6 (S)	LG-7
latitude:	21 48.2 S	21 51.4 S	23 21.3 S	18 38.6 S
longitude:	174 33.6 W	174 28.7 W	175 10.3 W	176 59.8 W
region:	TONGA FOR-ARC TERRACE	TONGA FOR-ARC TERRACE	TONGA FOR-ARC TERRACE	LAU BASIN (intermed)
Environment:	E	E	E	E - reentry?
water depth, m:	3790	4113	5665	2407
sed. thickness, m:	600+	?	500+	200-250
penetration, m:	550	550	550	200
TECHNIQUE:				
1. Single-Channel Seismic (a) high resolution	-	-	-	DARWIN CD-33(88)
(b) deep penetration	USGS?	USGS?	USGS?	-
3. MCS, including velocities	USGS & industry	USGS & industry	USGS & industry	-
4. Crossing Seismic Lines or Survey Grid	USGS? DARWIN CD-33(88)	USGS? DARWIN CD-33(88)	USGS? DARWIN CD-33(88)	CD-33 (88)
5. Seismic Refraction	-	-	-	-
6. 3.5 kHz	USGS? CD-33(88)	USGS? CD-33(88)	USGS? CD-33(88)	DARWIN CD-33(88)
7. Multi-beam Bathymetry	DESIRABLE	DESIRABLE	DESIRABLE	SeaBeam SONNE-48(87) SONNE-35(84-85)
8. Side Scan Sonar a. Shallow Source	CD-33(88)	CD-33(88)	CD-33(88)	DARWIN CD-33(88) GLORIA
b. Deep Towed Source	-	-	-	-
9. Heat Flow	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
10. Magnetics & Gravity	CD-33(88) USGS?	CD-33(88) USGS?	CD-33(88) USGS?	DARWIN CD-33(88)
11. Coring a. paleoenvironmental b. geotechnical	-	-	-	Imp. Col.
12. Dredging	USGS?	USGS?	USGS?	desirable
13. Photography	-	-	-	-
14. Current Meter (for bottom shear)	-	-	-	-

UPDATE: 10/13/88

SITE SURVEY DATA SUMMARY : AREA: LAU BASIN

TARGET SITE:	LG-8	LG-9	LG-9a	LG-10	LG-10a
latitude:	18 37.6 S	20 07.6 S	20 49.7 S	20 05.1 S	20 48.0 S
longitude:	177 22.0 W	176 42.8 W	176 51.3 W	176 34.3 W	176 37.8 W
region:	LAU BASIN	LAU BASIN	LAU BASIN	LAU BASIN	LAU BASIN
Environment:	E	E	E	E	E
water depth, m:	2085	2550	2292	1910	2360
sed. thickness, m:	<200	200-300	250-300	100-200	<200
penetration, m:	200	200	200	200	200
TECHNIQUE:					
1. Single-Channel Seismic (a) high resolution	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)
(b) deep penetration	-	-	-	-	-
3. MCS, including velocities	-	-	-	-	-
4. Crossing Seismic Lines or Survey Grid	CD-33 (88)	CD-33 (88)	CD-33 (88)	CD-33 (88)	CD-33 (88)
5. Seismic Refraction	-	CD-33 (sonobuoys)	CD-33 (sonobuoys)	CD-33 (sonobuoys)	CD-33 (sonobuoys)
6. 3.5 kHz	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)
7. Multi-beam Bathymetry	SeaBeam SONNE-48(87) SONNE-35(84-85)	SeaBeam SONNE-48(87) SONNE-35(84-85)	SeaBeam SONNE-48(87) SONNE-35(84-85)	SeaBeam SONNE-48(87) SONNE-35(84-85)	SeaBeam SONNE-48(87) SONNE-35(84-85)
8. Side Scan Sonar a. Shallow Source	DARWIN CD-33(88) GLORIA	DARWIN CD-33(88) GLORIA	DARWIN CD-33(88) GLORIA	DARWIN CD-33(88) GLORIA	DARWIN CD-33(88) GLORIA
b. Deep Towed Source	-	-	-	-	-
9. Heat Flow	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
10. Magnetics & Gravity	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)	DARWIN CD-33(88)
11. Coring a. paleoenvironmental b. geotechnical	Imp. Col.	Imp. Col.	Imp. Col.	Imp. Col.	Imp. Col.
12. Dredging	desirable	desirable	desirable	desirable	desirable
13. Photography	-	-	-	-	-
14. Current Meter (for bottom shear)	-	-	-	-	-

UPDATE: 10/13/88

VANUATU SITE SU :Y MATRIX - SEPT '88

	Site	DEZ-1(WPAC)	DEZ-2(WPAC)	DEZ-2'(Fisher+Collot)	DEZ-4(WPAC)
	Previous Site	NHA-2(#187)	DEZ-1(#190)		
	Previous Site		~NHA-1 (#187)		
	Target type	Active Margin	Active Margin	Active Margin	Active Margin
	Latitude	15° 20.5' S	15° 19.2' S	15° 19.5' S	15° 57' S
	Longitude	166° 16.5' E	166° 21.7' E	166° 21.7' E	166° 47.5' E
	Water depth	2500	2130	~2550	900
	Sed thickness	200	900	?900	>1000
	Penetration	300	1000	?1000	1000
	Re-entry	N	N	N	N
	Deep SCS	•	•	•	•
D	Hi Res SCS	*Charcot '85	*Charcot '85	*Charcot '85	*Charcot '85
R	MCS w/ vels	L104 sp 630	L104 sp 840	L104 sp 782	L100 sp 540
R	Cross lines	NO (perhaps SCS)	L106 sp 792	M1022 sp 228	L107 sp 782
D	Refraction	•	•	•	•
D	3.5 KHz	LEE	LEE	LEE +	LEE
R	Swathmap	*Charcot '85	*Charcot '85	*Charcot '85	*Charcot '85
	Shallow sidescan	•	•	•	•
	Deep sidescan	•	•	•	•
D	Heat flow	•	•	•	•
D	Magnetics	LEE	LEE	LEE +	LEE
D	Paleo-env coring	•	•	•	•
	Geotech coring	•	•	•	•
	Dredging	*Charcot '85	*Charcot '85	*Charcot '85	*Charcot '85
	Photography	•	•	•	•
D	Current meter	•	•	•	•
	Distance to xing	0.6 km	0.6 km		0.3 km
	* Where are the data and locations of SCS, SeaBeam + dredges?				
	**where is the refraction data + locations?				
	† ~0.6 km to M1041 sp 800				

VANUATU SITE S /EY MATRIX - SEPT '88

	Site	DEZ-5(WPAC)	IAB-1a(WPAC)	IAB-2a(WPAC)
	Previous Site	DEZ-2(#190)	IAB-1a (#190)	IAB-2(#190)
	Previous Site			
	Target type	Active Margin	Active Margin	Active Margin
	Latitude	16° 01' S' S	14° 47.5' S	14° 38.3' S
	Longitude	166° 40.5' E	167° 35' E	167° 55' E
	Water depth	1100	3075	2600
	Sed thickness	700	>1000	>1000
	Penetration	750	1000	1000
	Re-entry	N	N	N
	Deep SCS	•	•	•
D	Hi Res SCS	*Charcot '85	?	?
R	MCS w/ vels	L100 sp 792	L19 sp 860	L19 sp 1598
R	Cross lines	L106 sp2345	L17 sp 242	NO (perhaps SCS)
D	Refraction	•	ORSTOM/UTIG?**	ORSTOM/UTIG?**
D	3.5 KHz	LEE	LEE +	LEE
R	Swathmap	*Charcot '85	*Charcot '85	*Charcot '85
	Shallow sidescan	•	•	•
	Deep sidescan	•	•	•
D	Heat flow	•	•	•
D	Magnetics	LEE	LEE +	LEE
D	Paleo-env coring	•	•	•
	Geotech coring	•	•	•
	Dredging	*Charcot '85	•	•
	Photography	•	•	•
D	Current meter	•	•	•
	Distance to xing	0.2 km	0.6 km	
	* Where are the data and locations of SCS, SeaBeam + dredges?			
	**where is the refraction data + locations?			
	† ~0.6 km to M1041 sp 800			

SITE SURVEY DATA SUMMARY : AREA: Central Pacific Guyots

TARGET SITE:	SYL 1	SYL 1	HAR 1	HAR 3
latitude:	11 55 N	11 30 N	05 29 N	05 30 N
longitude:	164 40 E	165 00 E	172 20 E	172 05 E
region:	Sylvania Guyot	Sylvania FLANK	Harrie Guyot	Harrie Guyot
Environment:	G	G, E	G	G, E
water depth:	1350	4600	1500	4500
sed. thickness:	400	700	400	700
penetration:	650	800	650	800
TECHNIQUE:				
1. Single-Channel Seismic (a) high resolution	HIG, MW8805 KK810626-04	HIG, MW8805 KK810626-04	KK810626-02	KK810626-02
(b) deep penetration	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
3. MCS, including velocities	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
4. Crossing Seismic Lines or Survey Grid	HIG, MW8805 KK810626-04	HIG, MW8805 KK810626-04	KK810626-02	KK810626-02
5. Seismic Refraction	HIG, MW8805	HIG, MW8805	DESIRABLE	DESIRABLE
6. 3.5 kHz	HIG, MW8805 KK810626-04	HIG, MW8805 KK810626-04	KK810626-02	KK810626-02
7. Multi-beam Bathymetry	HIG, MW8805	HIG, MW8805	none	none
8. Side Scan Sonar a. Shallow Source	HIG, MW8805	HIG, MW8805	KK810626-02	KK810626-02
b. Deep Towed Source	-	-	-	-
9. Heat Flow	-	DESIRABLE	-	DESIRABLE
10. Magnetics and Gravity	HIG, MW8805	HIG, MW8805	KK810626-02	KK810626-02
11. Coring	-	-	-	-
12. Dredging	HIG, MW8805 KK810626-04	HIG, MW8805	KK810626-02	KK810626-02
13. Photography	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
14. Current Meter (for bottom shear)	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE

UPDATE: 9/26/88

SITE SURVEY DATA SUMMARY : AREA: Mid Pac Guyots

TARGET SITE:	Allison Guyot	Menard Guyot	Wilde Guyot	Isakov Guyot	Takuyo-daini Guyot
latitude:	18 30 N	20 45 N	21 09 N	13.3 N	34 15 N
longitude:	179 25 W	173 25 E	163 15 E	151.1 E	143 50 E
region:	Mid Pacs	Mid Pacs	Mid Pacs	Geisha Smts	Geisha Smts
Environment:	G	G	G	G	G
water depth, m:	1650	1370	1270	1340	1450
sed. thickness, m:	900	700?	<200	<100	?
penetration, m:	1000	800	500+	200-300	200-300
TECHNIQUE:					
1. Single-Channel Seismic (a) high resolution	1971, SIO Aries V	1971, SIO Aries V	1971, SIO Aries V	1971, SIO Aries V	1971, SIO Aries V
(b) deep penetration	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
3. MCS, including velocities	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
4. Crossing Seismic Lines or Survey Grid	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
5. Seismic Refraction	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
6. 3.5 kHz	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
7. Multi-beam Bathymetry	DESIRABLE	DESIRABLE	SASS, Smoot	SASS, Vogt, Smoot	SASS, Vogt, Smoot
8. Side Scan Sonar a. Shallow Source	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
b. Deep Towed Source	-	-	-	-	-
9. Heat Flow	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
10. Magnetics and Gravity	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
11. Coring	-	-	-	-	-
12. Dredging	DESIRABLE	SIO Aries V #12, 15	SIO Aries V #19, 20	DESIRABLE	DESIRABLE
13. Photography	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE
14. Current Meter (for bottom shear)	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE	DESIRABLE

UPDATE: 9/26/88

SITE SURVEY DATA SUMMARY : AREA: LOIHI SEAMOUNT

TARGET SITE:	LH1	LH2
latitude:	18 54 N	18 59 N
longitude:	155 14 W	155 16 W
region:	LIOIHI Summit	LOIHI north flank
Environment:	G,F	G,F
water depth, m:	1000	1000
sed. thickness, m:	0	0
penetration, m:	300-400	100-300
TECHNIQUE:		
1. Single-Channel Seismic (a) high resolution	HIG, USGS	HIG, USGS
(b) deep penetration	DESIRABLE	DESIRABLE
3. MCS, including velocities	DESIRABLE	DESIRABLE
4. Crossing Seismic Lines or Survey Grid	HIG, USGS	HIG, USGS
5. Seismic Refraction	USGS	USGS
6. 3.5 kHz	HIG, USGS	HIG, USGS
7. Multi-beam Bathymetry	HIG, USGS, SASS, SeaBEAM, SeaMARCII	HIG, USGS, SASS, SeaBEAM, SeaMARCII
8. Side Scan Sonar a. Shallow Source	HIG SeaMARC II	HIG SeaMARC II
b. Deep Towed Source	NEEDED	NEEDED
9. Heat Flow	Sub dives	Sub Dives
10. Magnetics and Gravity	HIG	HIG
11. Coring	-	-
12. Dredging	HIG, submersibles	HIG, submersibles
13. Photography	submersibles	submersibles
14. Current Meter (for bottom shear)	HIG	HIG

UPDATE: 9/26/88